CITY OF REDLANDS

MASTER PLAN OF DRAINAGE (MPD)

RBF CONSULTING
A Baker Company

TECHNICAL APPENDIX A.2

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

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             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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                          Analysis prepared by:

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 ************************* DESCRIPTION OF STUDY *************************
* 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
     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
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 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)
        VALLEY(DEVELOPED)                   1.000
        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 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"               A        5.28      0.86     1.000    46   17.77
  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
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  STREET HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      11.13
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.34
    HALFSTREET FLOOD WIDTH(FEET) =   10.93
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.24
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.46
  STREET FLOW TRAVEL TIME(MIN.) =   1.44   Tc(MIN.) =   19.21
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.476
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"                A        3.97      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) =    3.97      SUBAREA RUNOFF(CFS) =    5.77
  EFFECTIVE AREA(ACRES) =      9.25    AREA-AVERAGED Fm(INCH/HR) =  0.86
  AREA-AVERAGED Fp(INCH/HR) =  0.86  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =        9.2        PEAK FLOW RATE(CFS) =      13.45

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.56

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.36   HALFSTREET FLOOD WIDTH(FEET) =  11.87
  FLOW VELOCITY(FEET/SEC.) =  4.41   DEPTH*VELOCITY(FT*FT/SEC.) =   1.60
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10102.00 =    1022.70 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10102.00 TO NODE  10103.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2225.00  DOWNSTREAM ELEVATION(FEET) = 2210.00
  STREET LENGTH(FEET) =   350.54   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
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  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) =   0.73

    **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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"                A        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
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  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"                A        3.63      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) =    3.63      SUBAREA RUNOFF(CFS) =    4.76
  EFFECTIVE AREA(ACRES) =     16.82    AREA-AVERAGED Fm(INCH/HR) =  0.86
  AREA-AVERAGED Fp(INCH/HR) =  0.86  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =       16.8        PEAK FLOW RATE(CFS) =      22.06

  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) = 0.41   HALFSTREET FLOOD WIDTH(FEET) =  14.13
  FLOW VELOCITY(FEET/SEC.) =  5.21   DEPTH*VELOCITY(FT*FT/SEC.) =   2.13
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10104.00 =    1661.74 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10104.00 TO NODE  10105.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2195.00  DOWNSTREAM ELEVATION(FEET) = 2185.00
  STREET LENGTH(FEET) =   335.54   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) =   0.81

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      24.43
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.46
    HALFSTREET FLOOD WIDTH(FEET) =   16.48
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.31
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.97
  STREET FLOW TRAVEL TIME(MIN.) =   1.30   Tc(MIN.) =   22.75
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.237
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"                A        3.84      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) =    3.84      SUBAREA RUNOFF(CFS) =    4.76
  EFFECTIVE AREA(ACRES) =     20.66    AREA-AVERAGED Fm(INCH/HR) =  0.86
  AREA-AVERAGED Fp(INCH/HR) =  0.86  AREA-AVERAGED Ap =  1.00
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  TOTAL AREA(ACRES) =       20.7        PEAK FLOW RATE(CFS) =      25.60

  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) = 0.46   HALFSTREET FLOOD WIDTH(FEET) =  16.79
  FLOW VELOCITY(FEET/SEC.) =  4.36   DEPTH*VELOCITY(FT*FT/SEC.) =   2.01
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10105.00 =    1997.28 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10105.00 TO NODE  10106.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2185.00  DOWNSTREAM ELEVATION(FEET) = 2173.00
  STREET LENGTH(FEET) =   340.04   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) =   0.77

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      28.07
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.46
    HALFSTREET FLOOD WIDTH(FEET) =   16.79
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.78
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.21
  STREET FLOW TRAVEL TIME(MIN.) =   1.19   Tc(MIN.) =   23.94
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.170
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"                A        4.19      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) =    4.19      SUBAREA RUNOFF(CFS) =    4.94
  EFFECTIVE AREA(ACRES) =     24.85    AREA-AVERAGED Fm(INCH/HR) =  0.86
  AREA-AVERAGED Fp(INCH/HR) =  0.86  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =       24.9        PEAK FLOW RATE(CFS) =      29.29

  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) = 0.47   HALFSTREET FLOOD WIDTH(FEET) =  17.10
  FLOW VELOCITY(FEET/SEC.) =  4.81   DEPTH*VELOCITY(FT*FT/SEC.) =   2.25
  LONGEST FLOWPATH FROM NODE  10100.00 TO NODE  10106.00 =    2337.32 FEET.
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****************************************************************************
  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      Fp         Ap     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
```



```
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.822
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               A       10.49      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) =   10.49      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) =      35.53
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               A       10.72      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) =   10.72      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)<<<<<
```

```
==========================================================================
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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
```

```
 ************************************************************************
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                          Analysis prepared by:

                              RBF Consulting
                            14257 Alton Parkway
                                 Irvine, CA
                                   92618

 ************************* DESCRIPTION OF STUDY *************************
* 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:
========================================================================
                    --*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  10200.00 TO NODE  10201.00 IS CODE =  21
 ------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   646.58
  ELEVATION DATA: UPSTREAM(FEET) =   2060.00  DOWNSTREAM(FEET) =   2040.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   18.835
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.505
  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"               A        9.19      0.86     1.000    46   18.84
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.86
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =     13.61
  TOTAL AREA(ACRES) =      9.19   PEAK FLOW RATE(CFS) =     13.61

  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  10201.00 TO NODE  10202.00 IS CODE =  54
 ------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2040.00  DOWNSTREAM(FEET) =   2030.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   330.73   CHANNEL SLOPE =  0.0302
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   1.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      13.61
```

```
 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL FAIR COVER
 "OPEN BRUSH"                A        5.78      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) =    5.78      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) =      19.38

 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 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
```



```
 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) =      20.30
 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL FAIR COVER
 "OPEN BRUSH"                A        8.23      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) =    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.) =     30.40
 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
```

```
 ************************************************************************
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                          Analysis prepared by:

                              RBF Consulting
                            14257 Alton Parkway
                                 Irvine, CA
                                   92618

 ************************* DESCRIPTION OF STUDY *************************
* 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-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 0.0313 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   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)
        VALLEY(DEVELOPED)                   1.000
        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 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"               A        9.83      0.86     1.000    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
```

```
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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) =      21.55

  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) =      21.55
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               A       12.70      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) =   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):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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    32
  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) =      45.93
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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) =      68.72
  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      Fp         Ap     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    32
  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) =      76.50

  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"                A       14.75      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) =   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
```

```
 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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             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 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-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
          S-GRAPH TYPE                PERCENTAGE(DECIMAL)
        VALLEY(DEVELOPED)                   1.000
        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 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"               A        8.78      0.86     1.000    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
```

```
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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) =      23.30

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50

****************************************************************************
  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) =      23.30
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               A        9.28      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) =    9.28      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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               A        9.33      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) =    9.33      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
```

```
  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
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               A       16.37      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) =   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) =      42.94
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               A       17.25      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) =   17.25      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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               A       14.87      0.86     1.000    46
  PUBLIC PARK                A        3.24      0.98     0.850    32
  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
```

```
------------------------------------------------------------------------------
  >>>>>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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               A        4.54      0.86     1.000    46
  PUBLIC PARK                A       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 AREA(ACRES) =   19.79      SUBAREA RUNOFF(CFS) =   10.09
  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) =      54.63
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               A       12.14      0.86     1.000    46
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               A       29.91      0.86     1.000    46
  PUBLIC PARK                A       12.31      0.98     0.850    32
  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
```

```
 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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                          Analysis prepared by:

                              RBF Consulting
                            14257 Alton Parkway
                                 Irvine, CA
                                   92618

 ************************* DESCRIPTION OF STUDY *************************
* 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
     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)
        VALLEY(DEVELOPED)                    1.000
        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)]**0.20
  SUBAREA 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      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  NATURAL FAIR COVER
  "OPEN BRUSH"               A        5.34      0.86      1.000    46   35.16
  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)<<<<<
========================================================================
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BROWSH"                A        5.15      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) =    5.15      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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BROWSH"                A       15.29      0.86     1.000    46
```



```
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"         A        0.84      0.98     0.600    32
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BROWSH"                A       15.52      0.86     1.000    46
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"         A        0.80      0.98     0.600    32
  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
```

```
  CHANNEL LENGTH THRU SUBAREA(FEET) =   671.56   CHANNEL SLOPE =  0.0298
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   1.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      35.60
  FLOW VELOCITY(FEET/SEC.) =   2.40   FLOW DEPTH(FEET) =   0.54
  TRAVEL TIME(MIN.) =   4.66   Tc(MIN.) =   38.78
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10505.00 =    2956.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10505.00 TO NODE  10505.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   38.78
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.624
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               A       25.05      0.86     1.000    46
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        1.15      0.98     0.600    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.86
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.982
  SUBAREA AREA(ACRES) =   26.20      SUBAREA RUNOFF(CFS) =   18.30
  EFFECTIVE AREA(ACRES) =     69.76   AREA-AVERAGED Fm(INCH/HR) =  0.85
  AREA-AVERAGED Fp(INCH/HR) =  0.86  AREA-AVERAGED Ap =  0.98
  TOTAL AREA(ACRES) =       69.8       PEAK FLOW RATE(CFS) =      48.82

  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  10505.00 TO NODE  10506.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1815.00  DOWNSTREAM(FEET) =   1792.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   650.64   CHANNEL SLOPE =  0.0353
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   1.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      48.82
  FLOW VELOCITY(FEET/SEC.) =   2.78   FLOW DEPTH(FEET) =   0.59
  TRAVEL TIME(MIN.) =   3.90   Tc(MIN.) =   42.67
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10506.00 =    3607.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10506.00 TO NODE  10506.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   42.67
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.534
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
```



```
  "OPEN BRUSH"               A       20.76      0.86     1.000    46
  COMMERCIAL                 A        0.75      0.98     0.100    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        1.73      0.98     0.600    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.87
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.941
  SUBAREA AREA(ACRES) =   23.24      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
  TOTAL AREA(ACRES) =       93.0       PEAK FLOW RATE(CFS) =      58.16

  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  10506.00 TO NODE  10507.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1792.00  DOWNSTREAM(FEET) =   1765.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   726.03   CHANNEL SLOPE =  0.0372
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   1.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      58.16
  FLOW VELOCITY(FEET/SEC.) =   2.95   FLOW DEPTH(FEET) =   0.63
  TRAVEL TIME(MIN.) =   4.11   Tc(MIN.) =   46.78
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10507.00 =    4333.51 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10507.00 TO NODE  10507.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   46.78
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.451
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               A        2.43      0.86     1.000    46
  COMMERCIAL                 A       22.73      0.98     0.100    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        0.79      0.98     0.600    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.92
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.199
  SUBAREA AREA(ACRES) =   25.95      SUBAREA RUNOFF(CFS) =   29.60
  EFFECTIVE AREA(ACRES) =    118.95   AREA-AVERAGED Fm(INCH/HR) =  0.70
  AREA-AVERAGED Fp(INCH/HR) =  0.87  AREA-AVERAGED Ap =  0.80
  TOTAL AREA(ACRES) =      118.9       PEAK FLOW RATE(CFS) =      80.88

  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  10507.00 TO NODE  10508.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1765.00  DOWNSTREAM(FEET) =   1740.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   481.59   CHANNEL SLOPE =  0.0519
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   1.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      80.88
  FLOW VELOCITY(FEET/SEC.) =   3.62   FLOW DEPTH(FEET) =   0.67
  TRAVEL TIME(MIN.) =   2.22   Tc(MIN.) =   49.00
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10508.00 =    4815.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10508.00 TO NODE  10508.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   49.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.411
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A       21.75      0.98     0.100    32
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 A        0.49      0.88     1.000    44
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        1.52      0.98     0.600    32
  NATURAL FAIR COVER
  "OPEN BRUSH"               A        0.21      0.86     1.000    46
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.96
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.158
  SUBAREA AREA(ACRES) =   23.97      SUBAREA RUNOFF(CFS) =   27.19
  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) =     103.81

  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  10508.00 TO NODE  10509.00 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) =  1735.00
  FLOW LENGTH(FEET) =   143.12   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  25.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.73
  PIPE-FLOW(CFS) =     103.81
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =  49.12
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10509.00 =    4958.22 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10509.00 TO NODE  10510.00 IS CODE =  63
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----------------------------------------------------------------------------
  >>>>>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) =     103.81
    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) =     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

  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.

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  FLOW PROCESS FROM NODE  10510.00 TO NODE  10511.00 IS CODE =  63
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  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1720.00  DOWNSTREAM ELEVATION(FEET) = 1675.00
  STREET LENGTH(FEET) =  2077.22   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) =   0.70

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     140.02
    ***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.) =    6.53
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.12
  STREET FLOW TRAVEL TIME(MIN.) =   5.30   Tc(MIN.) =   55.29
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.313
  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       81.84      0.98     0.600    32
  MOBILE HOME PARK           A       12.29      0.98     0.250    32
  MOBILE HOME PARK           B        2.67      0.75     0.250    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.19      0.75     0.600    56
  SCHOOL                     A        2.03      0.98     0.600    32
  COMMERCIAL                 A        1.13      0.98     0.100    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.543
  SUBAREA AREA(ACRES) =  102.15      SUBAREA RUNOFF(CFS) =   72.42
  EFFECTIVE AREA(ACRES) =    245.07    AREA-AVERAGED Fm(INCH/HR) =  0.57
  AREA-AVERAGED Fp(INCH/HR) =  0.91  AREA-AVERAGED Ap =  0.63
  TOTAL AREA(ACRES) =      245.1        PEAK FLOW RATE(CFS) =     163.55

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.62; 1HR = 0.82; 3HR = 1.37; 6HR = 1.90; 24HR = 4.00

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.82   HALFSTREET FLOOD WIDTH(FEET) =  34.25
  FLOW VELOCITY(FEET/SEC.) =  6.76   DEPTH*VELOCITY(FT*FT/SEC.) =   5.58

  *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) =  39.00    NUMBER OF PIPES =   1
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  29.7 INCHES
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  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.34
  PIPE-FLOW(CFS) =     103.81
  PIPEFLOW TRAVEL TIME(MIN.) =   2.26    Tc(MIN.) =  52.24
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.358
  SUBAREA AREA(ACRES) =  102.15      SUBAREA RUNOFF(CFS) =   76.58
  TOTAL AREA(ACRES) =      245.1        PEAK FLOW RATE(CFS) =     173.55

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.62; 1HR = 0.82; 3HR = 1.37; 6HR = 1.90; 24HR = 4.00
  STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =   69.74
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.63
    HALFSTREET FLOOD WIDTH(FEET) =   24.60
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.43
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.43
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  2077.2 FT WITH ELEVATION-DROP =  45.0 FT, IS  228.2 CFS,
         WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE  10511.00
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10511.00 =    7796.38 FEET.

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  FLOW PROCESS FROM NODE  10511.00 TO NODE  10512.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1675.00  DOWNSTREAM ELEVATION(FEET) = 1620.00
  STREET LENGTH(FEET) =  1732.03   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) =   0.79

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     209.25
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.84
    HALFSTREET FLOOD WIDTH(FEET) =   34.98
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    8.30
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.97
  STREET FLOW TRAVEL TIME(MIN.) =   3.48   Tc(MIN.) =   55.72
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.307
  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       77.30      0.98     0.600    32
  MOBILE HOME PARK           A       17.32      0.98     0.250    32
  COMMERCIAL                 A        4.24      0.98     0.100    32
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  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.517
  SUBAREA AREA(ACRES) =   98.86      SUBAREA RUNOFF(CFS) =   71.40
  EFFECTIVE AREA(ACRES) =    343.93    AREA-AVERAGED Fm(INCH/HR) =  0.55
  AREA-AVERAGED Fp(INCH/HR) =  0.92  AREA-AVERAGED Ap =  0.60
  TOTAL AREA(ACRES) =      343.9        PEAK FLOW RATE(CFS) =     233.58

  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) =  36.51
  FLOW VELOCITY(FEET/SEC.) =  8.53   DEPTH*VELOCITY(FT*FT/SEC.) =   7.42

  *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.) =  15.49
  PIPE-FLOW(CFS) =     109.58
  PIPEFLOW TRAVEL TIME(MIN.) =   1.86    Tc(MIN.) =  54.11
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.330
  SUBAREA AREA(ACRES) =   98.86      SUBAREA RUNOFF(CFS) =   73.46
  TOTAL AREA(ACRES) =      343.9        PEAK FLOW RATE(CFS) =     240.78

  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) =  131.20
    ***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.) =    7.42
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.36
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  1732.0 FT WITH ELEVATION-DROP =  55.0 FT, IS  247.7 CFS,
         WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE  10512.00
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10512.00 =    9528.41 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10512.00 TO NODE  10513.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1620.00  DOWNSTREAM ELEVATION(FEET) = 1593.00
  STREET LENGTH(FEET) =  2438.23   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
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Manning's FRICTION FACTOR for Streetflow Section(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) =     254.50
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  1.07
  HALFSTREET FLOOD WIDTH(FEET) =   46.58
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.77
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.18
STREET FLOW TRAVEL TIME(MIN.) =   7.04   Tc(MIN.) =   61.15
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.236
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
COMMERCIAL                  A        3.47      0.98     0.100    32
RESIDENTIAL
"3-4 DWELLINGS/ACRE"        A       28.29      0.98     0.600    32
AGRICULTURAL FAIR COVER
"ORCHARDS"                  A       22.79      0.88     1.000    44
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.92
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.735
SUBAREA AREA(ACRES) =   54.55      SUBAREA RUNOFF(CFS) =   27.42
EFFECTIVE AREA(ACRES) =    398.48    AREA-AVERAGED Fm(INCH/HR) =  0.57
AREA-AVERAGED Fp(INCH/HR) =  0.92  AREA-AVERAGED Ap =  0.62
TOTAL AREA(ACRES) =      398.5        PEAK FLOW RATE(CFS) =     240.78
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) = 1.05   HALFSTREET FLOOD WIDTH(FEET) =  45.54
FLOW VELOCITY(FEET/SEC.) =  5.70   DEPTH*VELOCITY(FT*FT/SEC.) =   5.99

*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.) =  10.61
PIPE-FLOW(CFS) =     117.33
PIPEFLOW TRAVEL TIME(MIN.) =   3.83    Tc(MIN.) =  57.94
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.277
SUBAREA AREA(ACRES) =   54.55      SUBAREA RUNOFF(CFS) =   29.42
TOTAL AREA(ACRES) =      398.5        PEAK FLOW RATE(CFS) =     253.65

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =  136.32
  ***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.) =    5.01
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    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.35
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10513.00 =   11966.64 FEET.

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  FLOW PROCESS FROM NODE  10513.00 TO NODE  10514.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1593.00  DOWNSTREAM ELEVATION(FEET) = 1570.00
  STREET LENGTH(FEET) =  2581.60   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) =     277.07
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    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
  STREET FLOW TRAVEL TIME(MIN.) =   7.97   Tc(MIN.) =   65.91
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.182
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               A        0.39      0.86     1.000    46
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        3.30      0.98     0.600    32
  COMMERCIAL                 A       30.14      0.98     0.100    32
  PUBLIC PARK                A       28.02      0.98     0.850    32
  SCHOOL                     A        9.10      0.98     0.600    32
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 A        6.47      0.88     1.000    44
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.96
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.531
  SUBAREA AREA(ACRES) =   77.42      SUBAREA RUNOFF(CFS) =   46.83
  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) =     266.41

  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) = 1.13   HALFSTREET FLOOD WIDTH(FEET) =  49.51
  FLOW VELOCITY(FEET/SEC.) =  5.35   DEPTH*VELOCITY(FT*FT/SEC.) =   6.05
```



```
  *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
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.75
  PIPE-FLOW(CFS) =     171.15
  PIPEFLOW TRAVEL TIME(MIN.) =   4.00    Tc(MIN.) =  61.94
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.226
  SUBAREA AREA(ACRES) =   77.42      SUBAREA RUNOFF(CFS) =   49.95
  TOTAL AREA(ACRES) =      475.9        PEAK FLOW RATE(CFS) =     285.62

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
  STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =  114.48
    ***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.) =    4.44
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.76
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         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
  LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10514.00 =   14548.24 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10514.00 TO NODE  10543.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1570.00  DOWNSTREAM ELEVATION(FEET) = 1564.00
  STREET LENGTH(FEET) =   151.62   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) =   0.74

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     285.62
    ***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.) =    9.72
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    8.72
  STREET FLOW TRAVEL TIME(MIN.) =   0.26   Tc(MIN.) =   62.20
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.223
  SUBAREA AREA(ACRES) =    0.00      SUBAREA RUNOFF(CFS) =    0.00
```

```
  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 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"                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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"                A        8.15      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) =    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
```

```
  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      Fp         Ap     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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               A       15.94      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) =   15.94      SUBAREA RUNOFF(CFS) =   16.07
  EFFECTIVE AREA(ACRES) =     43.36   AREA-AVERAGED Fm(INCH/HR) =  0.86
```



```
  AREA-AVERAGED Fp(INCH/HR) =  0.86  AREA-AVERAGED Ap =  1.00
  TOTAL AREA(ACRES) =       43.4       PEAK FLOW RATE(CFS) =      43.72

  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               A       20.30      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) =   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.
```

```
****************************************************************************
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BROWSH"               A       23.91      0.86     1.000    46
  COMMERCIAL                  A        0.89      0.98     0.100    32
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BROWSH"               A       15.00      0.86     1.000    46
  COMMERCIAL                  A        8.17      0.98     0.100    32
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BROWSH"               A       12.34      0.86     1.000    46
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                  A        3.37      0.88     1.000    44
  COMMERCIAL                  A        5.75      0.98     0.100    32
  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) =      81.21
  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.
```

```
****************************************************************************
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK                A        4.62      0.98     0.850    32
  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"                 A       32.15      0.88     1.000    44
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK                A       18.01      0.98     0.850    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        3.96      0.98     0.600    32
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 A       53.29      0.88     1.000    44
```



```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK                A       15.83      0.98     0.850    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        4.11      0.98     0.600    32
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 A       35.99      0.88     1.000    44
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.91
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.928
  SUBAREA AREA(ACRES) =   55.93      SUBAREA RUNOFF(CFS) =   18.43
  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
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK               A       22.46      0.98     0.850    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"      A        1.50      0.98     0.600    32
  COMMERCIAL                A        8.47      0.98     0.100    32
  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      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                A        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      Fp         Ap     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    32
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                A        0.12      0.88     1.000    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

****************************************************************************
```

```
 FLOW PROCESS FROM NODE  10542.00 TO NODE  10542.00 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.) =   42.84
 RAINFALL INTENSITY(INCH/HR) =   1.53
 AREA-AVERAGED Fm(INCH/HR) =  0.43
 AREA-AVERAGED Fp(INCH/HR) =  0.91
 AREA-AVERAGED Ap =  0.47
 EFFECTIVE STREAM AREA(ACRES) =      14.83
 TOTAL STREAM AREA(ACRES) =      14.83
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      14.70

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      112.97   67.62    1.163  0.89( 0.80) 0.90     348.4   10520.00
     2       14.70   42.84    1.530  0.91( 0.43) 0.47      14.8   10540.00

 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      127.67   42.84    1.530  0.89( 0.78) 0.87     235.6   10540.00
     2      122.78   67.62    1.163  0.89( 0.79) 0.88     363.3   10520.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     127.67    Tc(MIN.) =    42.84
 EFFECTIVE AREA(ACRES) =     235.56   AREA-AVERAGED Fm(INCH/HR) =  0.78
 AREA-AVERAGED Fp(INCH/HR) =  0.89  AREA-AVERAGED Ap =  0.87
 TOTAL AREA(ACRES) =      363.3
 LONGEST FLOWPATH FROM NODE  10520.00 TO NODE  10542.00 =    8240.61 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10542.00 TO NODE  10543.00 IS CODE =  54
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1610.00  DOWNSTREAM(FEET) =   1564.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2038.97   CHANNEL SLOPE =  0.0226
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  15.000
 MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =     127.67
 FLOW VELOCITY(FEET/SEC.) =   4.02   FLOW DEPTH(FEET) =   1.45
 TRAVEL TIME(MIN.) =   8.44   Tc(MIN.) =   51.28
 LONGEST FLOWPATH FROM NODE  10520.00 TO NODE  10543.00 =   10279.58 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10543.00 TO NODE  10543.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
```



```
 MAINLINE Tc(MIN.) =   51.28
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.373
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL FAIR COVER
 "OPEN BRUSH"                A        7.65      0.86     1.000    46
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"        A        1.83      0.98     0.600    32
 PUBLIC PARK                 A       22.84      0.98     0.850    32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.94
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.871
 SUBAREA AREA(ACRES) =   32.32      SUBAREA RUNOFF(CFS) =   16.03
 EFFECTIVE AREA(ACRES) =    267.88   AREA-AVERAGED Fm(INCH/HR) =  0.78
 AREA-AVERAGED Fp(INCH/HR) =  0.90  AREA-AVERAGED Ap =  0.87
 TOTAL AREA(ACRES) =      395.6       PEAK FLOW RATE(CFS) =     141.93

 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  10543.00 TO NODE  10543.00 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      141.93   51.28    1.373  0.90( 0.78) 0.87     267.9   10540.00
     2      122.78   76.20    1.083  0.90( 0.79) 0.88     395.6   10520.00
 LONGEST FLOWPATH FROM NODE  10520.00 TO NODE  10543.00 =   10279.58 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      285.62   62.07    1.225  0.93( 0.56) 0.60     475.9   10500.00
 LONGEST FLOWPATH FROM NODE  10500.00 TO NODE  10543.00 =   14699.86 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      427.56   51.28    1.373  0.91( 0.65) 0.71     661.1   10540.00
     2      419.26   62.07    1.225  0.91( 0.65) 0.71     799.1   10500.00
     3      347.53   76.20    1.083  0.91( 0.66) 0.73     871.5   10520.00
   TOTAL AREA(ACRES) =       871.5

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      427.56  Tc(MIN.) =   51.282
 EFFECTIVE AREA(ACRES) =    661.07  AREA-AVERAGED Fm(INCH/HR) =  0.65
 AREA-AVERAGED Fp(INCH/HR) =  0.91  AREA-AVERAGED Ap =  0.71
 TOTAL AREA(ACRES) =      871.5
 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 =  71
----------------------------------------------------------------------------
 >>>>>PEAK FLOW RATE ESTIMATOR CHANGED TO UNIT-HYDROGRAPH METHOD<<<<<
```

```
  >>>>>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= 1.00
  UNIT-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 =  0.67
  PEAK FLOW RATE(CFS)   =    587.35
================================================================================
================================================================================
  END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

```
 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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             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 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

  *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
```



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 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  10600.00 TO NODE  10601.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   618.17
  ELEVATION DATA: UPSTREAM(FEET) =   1625.00  DOWNSTREAM(FEET) =   1623.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.512
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.202
  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
  "3-4 DWELLINGS/ACRE"       A        3.34      0.98      0.600    32   16.96
  MOBILE HOME PARK           A        0.22      0.98      0.250    32   13.83
  COMMERCIAL                 A        6.15      0.98      0.100    32   12.51
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.275
  SUBAREA RUNOFF(CFS) =     25.63
  TOTAL AREA(ACRES) =      9.71   PEAK FLOW RATE(CFS) =     25.63

  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  10601.00 TO NODE  10602.00 IS CODE =  63
------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
========================================================================
  UPSTREAM ELEVATION(FEET) = 1623.00  DOWNSTREAM ELEVATION(FEET) = 1620.00
  STREET LENGTH(FEET) =   304.04   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 32.00
```

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 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) =      33.33
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.61
   HALFSTREET FLOOD WIDTH(FEET) =   22.82
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.09
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.90
 STREET FLOW TRAVEL TIME(MIN.) =   1.64   Tc(MIN.) =   14.15
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.974
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 MOBILE HOME PARK           A        0.33      0.98     0.250    32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A        1.58      0.98     0.600    32
 COMMERCIAL                 A        4.32      0.98     0.100    32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.235
 SUBAREA AREA(ACRES) =    6.23      SUBAREA RUNOFF(CFS) =   15.39
 EFFECTIVE AREA(ACRES) =     15.94    AREA-AVERAGED Fm(INCH/HR) =  0.25
 AREA-AVERAGED Fp(INCH/HR) =  0.97  AREA-AVERAGED Ap =  0.26
 TOTAL AREA(ACRES) =       15.9        PEAK FLOW RATE(CFS) =      39.03

 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) =  24.30
 FLOW VELOCITY(FEET/SEC.) =  3.20   DEPTH*VELOCITY(FT*FT/SEC.) =   2.06
 LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10602.00 =     922.21 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10602.00 TO NODE  10603.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1620.00  DOWNSTREAM ELEVATION(FEET) = 1608.00
 STREET LENGTH(FEET) =   354.64   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
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 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) =      47.36
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.57
   HALFSTREET FLOOD WIDTH(FEET) =   20.55
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.36
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.05
 STREET FLOW TRAVEL TIME(MIN.) =   1.10   Tc(MIN.) =   15.26
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.843
 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        2.24      0.98     0.600    32
 COMMERCIAL                 A        4.90      0.98     0.100    32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.257
 SUBAREA AREA(ACRES) =    7.14      SUBAREA RUNOFF(CFS) =   16.66
 EFFECTIVE AREA(ACRES) =     23.08    AREA-AVERAGED Fm(INCH/HR) =  0.25
 AREA-AVERAGED Fp(INCH/HR) =  0.98  AREA-AVERAGED Ap =  0.26
 TOTAL AREA(ACRES) =       23.1        PEAK FLOW RATE(CFS) =      53.81

 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) = 0.59   HALFSTREET FLOOD WIDTH(FEET) =  21.65
 FLOW VELOCITY(FEET/SEC.) =  5.52   DEPTH*VELOCITY(FT*FT/SEC.) =   3.26
 LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10603.00 =    1276.85 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10603.00 TO NODE  10604.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1608.00  DOWNSTREAM ELEVATION(FEET) = 1596.00
 STREET LENGTH(FEET) =   420.77   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) =      62.88
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.63
   HALFSTREET FLOOD WIDTH(FEET) =   23.84
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.36
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.40
```

```
 STREET FLOW TRAVEL TIME(MIN.) =   1.31   Tc(MIN.) =   16.56
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.706
 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        2.80      0.98     0.600    32
 COMMERCIAL                 A        4.90      0.98     0.100    32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        0.05      0.75     0.600    56
 COMMERCIAL                 B        0.50      0.75     0.100    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.273
 SUBAREA AREA(ACRES) =    8.25      SUBAREA RUNOFF(CFS) =   18.13
 EFFECTIVE AREA(ACRES) =     31.33    AREA-AVERAGED Fm(INCH/HR) =  0.26
 AREA-AVERAGED Fp(INCH/HR) =  0.97  AREA-AVERAGED Ap =  0.26
 TOTAL AREA(ACRES) =       31.3        PEAK FLOW RATE(CFS) =      69.10

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50

 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
 LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10604.00 =    1697.62 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10604.00 TO NODE  10605.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION # 18 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1596.00  DOWNSTREAM ELEVATION(FEET) = 1590.00
 STREET LENGTH(FEET) =   926.26   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) =   0.87

   **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
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A        8.73      0.98     0.600    32
 COMMERCIAL                 A        3.00      0.98     0.100    32
 MOBILE HOME PARK           A        3.84      0.98     0.250    32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.417
 SUBAREA AREA(ACRES) =   15.57      SUBAREA RUNOFF(CFS) =   27.24
 EFFECTIVE AREA(ACRES) =     46.90    AREA-AVERAGED Fm(INCH/HR) =  0.31
 AREA-AVERAGED Fp(INCH/HR) =  0.97  AREA-AVERAGED Ap =  0.31
 TOTAL AREA(ACRES) =       46.9        PEAK FLOW RATE(CFS) =      86.32

 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) = 0.84   HALFSTREET FLOOD WIDTH(FEET) =  34.91
 FLOW VELOCITY(FEET/SEC.) =  3.57   DEPTH*VELOCITY(FT*FT/SEC.) =   3.02
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  926.3 FT WITH ELEVATION-DROP =   6.0 FT, IS   38.6 CFS,
        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.

****************************************************************************
 FLOW PROCESS FROM NODE  10605.00 TO NODE  10606.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION # 18 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1590.00  DOWNSTREAM ELEVATION(FEET) = 1587.00
 STREET LENGTH(FEET) =   420.00   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) =   1.07

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      98.14
   ***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
 MOBILE HOME PARK           A        3.93      0.98     0.250    32
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  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
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        1.08      0.98     0.100    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A       11.66      0.98     0.600    32
  MOBILE HOME PARK           A        4.18      0.98     0.250    32
  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
```



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  AREA-AVERAGED Fp(INCH/HR) =  0.97  AREA-AVERAGED Ap =  0.37
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A       22.59      0.98     0.600    32
  COMMERCIAL                 A        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
```

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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 A       10.97      0.88     1.000    44
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A       20.08      0.98     0.600    32
  COMMERCIAL                 A        2.51      0.98     0.100    32
  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
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  FLOW VELOCITY(FEET/SEC.) =  3.76   DEPTH*VELOCITY(FT*FT/SEC.) =   4.04

  *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      Fp         Ap     SCS
```

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     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        1.61      0.98     0.600    32
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 A       25.43      0.88     1.000    44
  COMMERCIAL                 A        2.74      0.98     0.100    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.88
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.896
  SUBAREA AREA(ACRES) =   29.78      SUBAREA RUNOFF(CFS) =   26.00
  EFFECTIVE AREA(ACRES) =    165.83    AREA-AVERAGED Fm(INCH/HR) =  0.52
  AREA-AVERAGED Fp(INCH/HR) =  0.94  AREA-AVERAGED Ap =  0.56
  TOTAL AREA(ACRES) =      165.8        PEAK FLOW RATE(CFS) =     184.86

  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) = 1.01   HALFSTREET FLOOD WIDTH(FEET) =  43.21
  FLOW VELOCITY(FEET/SEC.) =  4.98   DEPTH*VELOCITY(FT*FT/SEC.) =   5.03
  ** 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.) =  16.46
  PIPE-FLOW(CFS) =      51.77
  PIPEFLOW TRAVEL TIME(MIN.) =   1.11    Tc(MIN.) =  31.30
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.847
  SUBAREA AREA(ACRES) =   29.78      SUBAREA RUNOFF(CFS) =   28.28
  TOTAL AREA(ACRES) =      165.8        PEAK FLOW RATE(CFS) =     197.55

  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) =  145.79
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.94
    HALFSTREET FLOOD WIDTH(FEET) =   39.61
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.68
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.39
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10610.00 =    6500.90 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10610.00 TO NODE  10611.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1565.00  DOWNSTREAM(FEET) =   1542.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1070.05   CHANNEL SLOPE =  0.0215
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  75.000
  MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     197.55
  FLOW VELOCITY(FEET/SEC.) =   2.93   FLOW DEPTH(FEET) =   0.95
  TRAVEL TIME(MIN.) =   6.10   Tc(MIN.) =   37.40
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10611.00 =    7570.95 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10611.00 TO NODE  10611.00 IS CODE =  81
```



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----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   37.40
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.660
  SUBAREA LOSS RATE DATA(AMC  II):
   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     1.000    46
  COMMERCIAL                 A        0.50      0.98     0.100    32
  SCHOOL                     A       44.97      0.98     0.600    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        0.33      0.98     0.600    32
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 A        0.47      0.88     1.000    44
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.600
  SUBAREA AREA(ACRES) =   46.37      SUBAREA RUNOFF(CFS) =   44.93
  EFFECTIVE AREA(ACRES) =    212.20   AREA-AVERAGED Fm(INCH/HR) =  0.54
  AREA-AVERAGED Fp(INCH/HR) =  0.95  AREA-AVERAGED Ap =  0.57
  TOTAL AREA(ACRES) =      212.2        PEAK FLOW RATE(CFS) =     214.57

  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  10611.00 TO NODE  10612.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1542.00  DOWNSTREAM(FEET) =   1515.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1122.52   CHANNEL SLOPE =  0.0241
  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.) =   3.13   FLOW DEPTH(FEET) =   0.96
  TRAVEL TIME(MIN.) =   5.98   Tc(MIN.) =   43.38
  LONGEST FLOWPATH FROM NODE  10600.00 TO NODE  10612.00 =    8693.47 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10612.00 TO NODE  10612.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   43.38
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.519
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  SCHOOL                     A       28.27      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) =   28.27      SUBAREA RUNOFF(CFS) =   23.75
  EFFECTIVE AREA(ACRES) =    240.47   AREA-AVERAGED Fm(INCH/HR) =  0.54
  AREA-AVERAGED Fp(INCH/HR) =  0.95  AREA-AVERAGED Ap =  0.57
  TOTAL AREA(ACRES) =      240.5        PEAK FLOW RATE(CFS) =     214.57
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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  SCHOOL                     A       17.15      0.98     0.600    32
  SCHOOL                     B        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.
```



```
****************************************************************************
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  SCHOOL                     A       24.96      0.98     0.600    32
  NATURAL FAIR COVER
  "OPEN BRUSH"               A        0.05      0.86     1.000    46
  SCHOOL                     B        5.81      0.75     0.600    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        0.10      0.98     0.600    32
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 A        0.07      0.88     1.000    44
  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
```

```
 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
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                          Analysis prepared by:

                              RBF Consulting
                            14257 Alton Parkway
                                 Irvine, CA
                                   92618

 ************************* DESCRIPTION OF STUDY *************************
* REDLANDS MPD  - UPDATE                                                 *
* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 10714 (FILE LR0107ZZ)      *
* 100-YR  HC ULTIMATE CONDITION    OCTOBER 2013   IESCOBAR               *
 ************************************************************************

  FILE NAME: LR0107ZZ.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

  *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
```



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 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  10700.00 TO NODE  10701.00 IS CODE =  21
 ------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   713.44
  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.) =   11.353
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.394
  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
  "3-4 DWELLINGS/ACRE"       A        0.96      0.98      0.600    32   15.39
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 A        2.89      0.88      1.000    44   26.36
  COMMERCIAL                 A        0.58      0.98      0.100    32   11.35
  COMMERCIAL                 B        1.54      0.75      0.100    56   11.35
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.44      0.75      0.600    56   15.39
  MOBILE HOME PARK           B        2.21      0.75      0.250    56   12.55
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.85
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.530
  SUBAREA RUNOFF(CFS) =     25.48
  TOTAL AREA(ACRES) =      9.62   PEAK FLOW RATE(CFS) =     25.48

  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  10701.00 TO NODE  10702.00 IS CODE =  62
 ------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
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```
 >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
================================================================================
 UPSTREAM ELEVATION(FEET) = 1590.00  DOWNSTREAM ELEVATION(FEET) = 1585.00
 STREET LENGTH(FEET) =   219.37   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

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      39.68
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.57
   HALFSTREET FLOOD WIDTH(FEET) =   20.79
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.40
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.52
 STREET FLOW TRAVEL TIME(MIN.) =   0.83   Tc(MIN.) =   12.18
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.253
 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        3.42      0.88     1.000    44
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A        0.44      0.98     0.600    32
 COMMERCIAL                 A        0.99      0.98     0.100    32
 COMMERCIAL                 B        2.42      0.75     0.100    56
 MOBILE HOME PARK           B        3.53      0.75     0.250    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        0.22      0.75     0.600    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.85
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.457
 SUBAREA AREA(ACRES) =   11.02      SUBAREA RUNOFF(CFS) =   28.39
 EFFECTIVE AREA(ACRES) =     20.64    AREA-AVERAGED Fm(INCH/HR) =  0.42
 AREA-AVERAGED Fp(INCH/HR) =  0.85  AREA-AVERAGED Ap =  0.49
 TOTAL AREA(ACRES) =       20.6        PEAK FLOW RATE(CFS) =      52.66

 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) = 0.62   HALFSTREET FLOOD WIDTH(FEET) =  23.21
 FLOW VELOCITY(FEET/SEC.) =  4.72   DEPTH*VELOCITY(FT*FT/SEC.) =   2.94
 LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10702.00 =     932.81 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10702.00 TO NODE  10703.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(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
```



```
 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                 B        1.80      0.75     0.100    56
 MOBILE HOME PARK           B        2.65      0.75     0.250    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        0.15      0.75     0.600    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.86
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.490
 SUBAREA AREA(ACRES) =    9.27      SUBAREA RUNOFF(CFS) =   22.81
 EFFECTIVE AREA(ACRES) =     29.91    AREA-AVERAGED Fm(INCH/HR) =  0.42
 AREA-AVERAGED Fp(INCH/HR) =  0.85  AREA-AVERAGED Ap =  0.49
 TOTAL AREA(ACRES) =       29.9        PEAK FLOW RATE(CFS) =      73.64

 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) = 0.68   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.

****************************************************************************
 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
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 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow 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) =      88.76
   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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 A        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
 COMMERCIAL                 B        0.38      0.75     0.100    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        5.67      0.75     0.600    56
 MOBILE HOME PARK           B        0.62      0.75     0.250    56
 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
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 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =     119.99
   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      Fp         Ap     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
 "3-4 DWELLINGS/ACRE"       B        9.00      0.75     0.600    56
 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.

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 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
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  **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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 A        4.00      0.88     1.000    44
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 B        2.81      0.63     1.000    65
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A        4.90      0.98     0.600    32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        7.75      0.75     0.600    56
 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:
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  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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 A        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    65
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B       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.

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 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) =     229.50
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
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  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         Ap     SCS
      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)<<<<<
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 UPSTREAM ELEVATION(FEET) = 1528.00  DOWNSTREAM ELEVATION(FEET) = 1510.00
 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 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    56
 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):
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  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.

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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A       19.57      0.98     0.600    32
  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:
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  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.

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  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):
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 DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        9.73      0.75      0.600    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A       12.66      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) =   22.39      SUBAREA RUNOFF(CFS) =   36.90
 EFFECTIVE AREA(ACRES) =    250.46    AREA-AVERAGED Fm(INCH/HR) =  0.51
 AREA-AVERAGED Fp(INCH/HR) =  0.83  AREA-AVERAGED Ap =  0.61
 TOTAL AREA(ACRES) =      250.5        PEAK FLOW RATE(CFS) =     416.31

 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) = 1.17   HALFSTREET FLOOD WIDTH(FEET) =  57.10
 FLOW VELOCITY(FEET/SEC.) =  7.28   DEPTH*VELOCITY(FT*FT/SEC.) =   8.51

 *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
        THE MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.00
 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.) =  29.19
 PIPE-FLOW(CFS) =     206.51
 PIPEFLOW TRAVEL TIME(MIN.) =   0.41    Tc(MIN.) =  19.62
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.445
 SUBAREA AREA(ACRES) =   22.39      SUBAREA RUNOFF(CFS) =   38.67
 TOTAL AREA(ACRES) =      250.5        PEAK FLOW RATE(CFS) =     436.11

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =  229.60
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.98
   HALFSTREET FLOOD WIDTH(FEET) =   47.58
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.17
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.03
 LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10711.00 =    5846.04 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  10711.00 TO NODE  10712.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION # 18 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1483.00  DOWNSTREAM ELEVATION(FEET) = 1477.00
 STREET LENGTH(FEET) =  1414.25   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
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 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =     501.97
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  1.61
   HALFSTREET FLOOD WIDTH(FEET) =   73.18
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.70
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    7.56
 STREET FLOW TRAVEL TIME(MIN.) =   5.02   Tc(MIN.) =   24.63
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.132
 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       31.83      0.98      0.600    32
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 A       45.08      0.88      1.000    44
 PUBLIC PARK                A        4.20      0.98      0.850    32
 SCHOOL                     A        1.83      0.98      0.600    32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B       18.12      0.75      0.600    56
 SCHOOL                     B        0.93      0.75      0.600    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.89
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.787
 SUBAREA AREA(ACRES) =  101.99      SUBAREA RUNOFF(CFS) =  131.49
 EFFECTIVE AREA(ACRES) =    352.45    AREA-AVERAGED Fm(INCH/HR) =  0.57
 AREA-AVERAGED Fp(INCH/HR) =  0.85  AREA-AVERAGED Ap =  0.66
 TOTAL AREA(ACRES) =      352.5        PEAK FLOW RATE(CFS) =     497.19

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.90

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.60   HALFSTREET FLOOD WIDTH(FEET) =  72.87
 FLOW VELOCITY(FEET/SEC.) =  4.69   DEPTH*VELOCITY(FT*FT/SEC.) =   7.53

 *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) =  63.00    NUMBER OF PIPES =   1
 DEPTH OF FLOW IN  63.0 INCH PIPE IS  48.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  24.34
 PIPE-FLOW(CFS) =     436.11
 PIPEFLOW TRAVEL TIME(MIN.) =   0.97    Tc(MIN.) =  20.58
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.375
 SUBAREA AREA(ACRES) =  101.99      SUBAREA RUNOFF(CFS) =  153.76
 TOTAL AREA(ACRES) =      352.5        PEAK FLOW RATE(CFS) =     574.17

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.90
 *NOTE: STREET-CAPACITY MAY BE EXCEEDED*
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  STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =  138.06
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  1.04
    HALFSTREET FLOOD WIDTH(FEET) =   44.67
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.48
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.62
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  1414.2 FT WITH ELEVATION-DROP =   6.0 FT, IS  143.2 CFS,
         WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE  10712.00
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10712.00 =    7260.29 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10712.00 TO NODE  10713.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 18 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1477.00  DOWNSTREAM ELEVATION(FEET) = 1456.00
  STREET LENGTH(FEET) =  1655.07   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) =     686.96
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  1.48
    HALFSTREET FLOOD WIDTH(FEET) =   66.83
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.71
    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
  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       94.94      0.88     1.000    44
  PUBLIC PARK                A       55.36      0.98     0.850    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A       14.22      0.98     0.600    32
  SCHOOL                     A       11.27      0.98     0.600    32
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        7.08      0.63     1.000    65
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.62      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.90
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.895
  SUBAREA AREA(ACRES) =  185.49      SUBAREA RUNOFF(CFS) =  225.18
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  EFFECTIVE AREA(ACRES) =    537.94    AREA-AVERAGED Fm(INCH/HR) =  0.65
  AREA-AVERAGED Fp(INCH/HR) =  0.87  AREA-AVERAGED Ap =  0.74
  TOTAL AREA(ACRES) =      537.9        PEAK FLOW RATE(CFS) =     730.27

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.46

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 1.51   HALFSTREET FLOOD WIDTH(FEET) =  68.42
  FLOW VELOCITY(FEET/SEC.) =  7.82   DEPTH*VELOCITY(FT*FT/SEC.) =  11.85

  *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
  DEPTH OF FLOW IN  57.0 INCH PIPE IS  43.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  39.36
  PIPE-FLOW(CFS) =     574.17
  PIPEFLOW TRAVEL TIME(MIN.) =   0.70    Tc(MIN.) =  21.28
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.328
  SUBAREA AREA(ACRES) =  185.49      SUBAREA RUNOFF(CFS) =  253.64
  TOTAL AREA(ACRES) =      537.9        PEAK FLOW RATE(CFS) =     812.82

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.46
  *NOTE: STREET-CAPACITY MAY BE EXCEEDED*
  STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =  238.66
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  1.04
    HALFSTREET FLOOD WIDTH(FEET) =   44.67
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.01
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.25
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  1655.1 FT WITH ELEVATION-DROP =  21.0 FT, IS  279.3 CFS,
         WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE  10713.00
  LONGEST FLOWPATH FROM NODE  10700.00 TO NODE  10713.00 =    8915.36 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10713.00 TO NODE  10714.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1456.00  DOWNSTREAM ELEVATION(FEET) = 1425.00
  STREET LENGTH(FEET) =  2081.11   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0180
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200
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MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) =   0.70

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     979.55
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  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      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
PUBLIC PARK                A       76.60      0.98     0.850    32
COMMERCIAL                 A       73.07      0.98     0.100    32
AGRICULTURAL FAIR COVER
"ORCHARDS"                 A       49.11      0.88     1.000    44
PUBLIC PARK                B       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"       B       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
*NOTE: STREET-CAPACITY MAY BE EXCEEDED*
STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =  348.75
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  1.14
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  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
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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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                          Analysis prepared by:

                              RBF Consulting
                            14257 Alton Parkway
                                 Irvine, CA
                                   92618

 ************************* DESCRIPTION OF STUDY *************************
* 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)
===  =====  =========  =================  ======  ===== ====== ===== =======
  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
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 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 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
  "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
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  MAXIMUM DEPTH(FEET) =   1.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.674
  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        1.83      0.75     0.600    56
  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) =      24.28
    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      Fp         Ap     SCS
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       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.16      0.75     0.600    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A       11.90      0.98     0.600    32
  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) =      46.50
    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A       15.25      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) =   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
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  TOTAL AREA(ACRES) =       35.1        PEAK FLOW RATE(CFS) =      55.90

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

  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
  LONGEST FLOWPATH FROM NODE  10800.00 TO NODE  10804.00 =    1943.36 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10804.00 TO NODE  10805.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1465.00  DOWNSTREAM ELEVATION(FEET) = 1460.00
  STREET LENGTH(FEET) =   800.06   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) =   1.07

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      75.74
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.83
    HALFSTREET FLOOD WIDTH(FEET) =   40.19
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.12
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.59
  STREET FLOW TRAVEL TIME(MIN.) =   4.27   Tc(MIN.) =   25.33
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.097
  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       12.48      0.98     0.600    32
  MOBILE HOME PARK           A        9.98      0.98     0.250    32
  SCHOOL                     A        4.41      0.98     0.600    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.470
  SUBAREA AREA(ACRES) =   26.87      SUBAREA RUNOFF(CFS) =   39.63
  EFFECTIVE AREA(ACRES) =     61.97    AREA-AVERAGED Fm(INCH/HR) =  0.52
  AREA-AVERAGED Fp(INCH/HR) =  0.96  AREA-AVERAGED Ap =  0.54
  TOTAL AREA(ACRES) =       62.0        PEAK FLOW RATE(CFS) =      87.77

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

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.86   HALFSTREET FLOOD WIDTH(FEET) =  41.72
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  FLOW VELOCITY(FEET/SEC.) =  3.28   DEPTH*VELOCITY(FT*FT/SEC.) =   2.82
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  800.1 FT WITH ELEVATION-DROP =   5.0 FT, IS   63.1 CFS,
         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.

****************************************************************************
  FLOW PROCESS FROM NODE  10805.00 TO NODE  10806.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1460.00  DOWNSTREAM ELEVATION(FEET) = 1420.00
  STREET LENGTH(FEET) =  1682.03   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) =     125.37
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.80
    HALFSTREET FLOOD WIDTH(FEET) =   38.50
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.79
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.61
  STREET FLOW TRAVEL TIME(MIN.) =   4.84   Tc(MIN.) =   30.17
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.888
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           A       25.95      0.98     0.250    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A       16.72      0.98     0.600    32
  SCHOOL                     A       14.61      0.98     0.600    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.441
  SUBAREA AREA(ACRES) =   57.28      SUBAREA RUNOFF(CFS) =   75.15
  EFFECTIVE AREA(ACRES) =    119.25    AREA-AVERAGED Fm(INCH/HR) =  0.48
  AREA-AVERAGED Fp(INCH/HR) =  0.97  AREA-AVERAGED Ap =  0.49
  TOTAL AREA(ACRES) =      119.2        PEAK FLOW RATE(CFS) =     151.26

  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) = 0.84   HALFSTREET FLOOD WIDTH(FEET) =  40.44
  FLOW VELOCITY(FEET/SEC.) =  6.13   DEPTH*VELOCITY(FT*FT/SEC.) =   5.12
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1682.0 FT WITH ELEVATION-DROP =  40.0 FT, IS  133.1 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE  10806.00
  LONGEST FLOWPATH FROM NODE  10800.00 TO NODE  10806.00 =    4425.45 FEET.
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  FLOW PROCESS FROM NODE  10806.00 TO NODE  10807.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1420.00  DOWNSTREAM ELEVATION(FEET) = 1392.00
  STREET LENGTH(FEET) =  1712.03   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) =   1.01

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     183.28
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.92
    HALFSTREET FLOOD WIDTH(FEET) =   44.77
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.72
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.27
  STREET FLOW TRAVEL TIME(MIN.) =   4.99   Tc(MIN.) =   35.16
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.722
  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       44.48      0.98     0.600    32
  MOBILE HOME PARK           A        4.71      0.98     0.250    32
  COMMERCIAL                 A        8.32      0.98     0.100    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.499
  SUBAREA AREA(ACRES) =   57.51      SUBAREA RUNOFF(CFS) =   63.97
  EFFECTIVE AREA(ACRES) =    176.76    AREA-AVERAGED Fm(INCH/HR) =  0.48
  AREA-AVERAGED Fp(INCH/HR) =  0.97  AREA-AVERAGED Ap =  0.50
  TOTAL AREA(ACRES) =      176.8        PEAK FLOW RATE(CFS) =     197.46

  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) = 0.94   HALFSTREET FLOOD WIDTH(FEET) =  45.69
  FLOW VELOCITY(FEET/SEC.) =  5.86   DEPTH*VELOCITY(FT*FT/SEC.) =   5.51
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1712.0 FT WITH ELEVATION-DROP =  28.0 FT, IS  132.5 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE  10807.00
  LONGEST FLOWPATH FROM NODE  10800.00 TO NODE  10807.00 =    6137.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  10807.00 TO NODE  10808.00 IS CODE =  63
----------------------------------------------------------------------------
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  >>>>>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

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 1.44   HALFSTREET FLOOD WIDTH(FEET) =  64.57
  FLOW VELOCITY(FEET/SEC.) =  3.57   DEPTH*VELOCITY(FT*FT/SEC.) =   5.14

  *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
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  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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     391.64
    ***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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
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  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) =     421.99

  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
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Manning's FRICTION FACTOR for Streetflow 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) =     511.95
  ***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      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
RESIDENTIAL
"3-4 DWELLINGS/ACRE"       A       85.15      0.98     0.600    32
RESIDENTIAL
"3-4 DWELLINGS/ACRE"       B       51.42      0.75     0.600    56
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
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*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 A       67.01      0.88     1.000    44
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A       27.08      0.98     0.600    32
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 B       32.87      0.63     1.000    65
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        0.20      0.75     0.600    56
 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 Tc :
 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
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    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) =      734.7
  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
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             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
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                          Analysis prepared by:

                              RBF Consulting
                            14257 Alton Parkway
                                 Irvine, CA
                                   92618

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

  *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
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 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  10900.00 TO NODE  10901.00 IS CODE =  21
 ------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   952.49
  ELEVATION DATA: UPSTREAM(FEET) =   1385.00  DOWNSTREAM(FEET) =   1378.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   17.108
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.652
  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
  "3-4 DWELLINGS/ACRE"       A        5.69      0.98     0.600    32   17.11
  PUBLIC PARK                A        3.97      0.98     0.850    32   20.06
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.703
  SUBAREA RUNOFF(CFS) =     17.10
  TOTAL AREA(ACRES) =      9.66   PEAK FLOW RATE(CFS) =     17.10

  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  10901.00 TO NODE  10902.00 IS CODE =  62
 ------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 18 USED)<<<<<
========================================================================
  UPSTREAM ELEVATION(FEET) = 1378.00  DOWNSTREAM ELEVATION(FEET) = 1376.00
  STREET LENGTH(FEET) =   238.62   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 26.00
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  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) =      25.15
    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      Fp         Ap     SCS
       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
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    **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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        5.02      0.98     0.600    32
  PUBLIC PARK                A        4.30      0.98     0.850    32
  SCHOOL                     A        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.

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  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
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 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.366
 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        4.65      0.98     0.600    32
 SCHOOL                     A        5.21      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) =    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) =      60.03

 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) = 0.70   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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A        5.98      0.98     0.600    32
 SCHOOL                     A        5.81      0.98     0.600    32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
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 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.600
 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) =      75.08

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

 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A        6.54      0.98     0.600    32
 SCHOOL                     A        6.29      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) =   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
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  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A       14.56      0.98     0.600    32
  SCHOOL                     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
```



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----------------------------------------------------------------------------
  >>>>>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) =     121.15
    ***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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A       15.01      0.98     0.600    32
  COMMERCIAL                 A        0.76      0.98     0.100    32
  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
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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        5.32      0.98     0.600    32
  COMMERCIAL                 A        3.33      0.98     0.100    32
  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
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  Manning's FRICTION FACTOR for Streetflow 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) =     157.44
    ***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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A       30.86      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) =   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.

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 FLOW PROCESS FROM NODE  10910.00 TO NODE  10911.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION # 18 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1337.00  DOWNSTREAM ELEVATION(FEET) = 1330.00
 STREET LENGTH(FEET) =  1342.00   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) =   1.07

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     190.21
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  1.12
   HALFSTREET FLOOD WIDTH(FEET) =   48.46
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.07
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.54
 STREET FLOW TRAVEL TIME(MIN.) =   5.50   Tc(MIN.) =   36.93
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.671
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 PUBLIC PARK                A        0.46      0.98     0.850    32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A       71.69      0.98     0.600    32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.602
 SUBAREA AREA(ACRES) =   72.15      SUBAREA RUNOFF(CFS) =   70.43
 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

 *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
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 SUBAREA AREA(ACRES) =   72.15      SUBAREA RUNOFF(CFS) =   74.35
 TOTAL AREA(ACRES) =      209.8        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.) =     34.81
 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
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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
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                          Analysis prepared by:

                              RBF Consulting
                            14257 Alton Parkway
                                 Irvine, CA
                                   92618

 ************************* DESCRIPTION OF STUDY *************************
* 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 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
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 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  11000.00 TO NODE  11001.00 IS CODE =  21
 ------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   604.68
  ELEVATION DATA: UPSTREAM(FEET) =   1395.00  DOWNSTREAM(FEET) =   1385.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.891
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.687
  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
  "3-4 DWELLINGS/ACRE"       A        1.70      0.98      0.600    32   12.13
  PUBLIC PARK                A        2.08      0.98      0.850    32   14.22
  MOBILE HOME PARK           A        2.84      0.98      0.250    32    9.89
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.528
  SUBAREA RUNOFF(CFS) =     18.90
  TOTAL AREA(ACRES) =      6.62   PEAK FLOW RATE(CFS) =     18.90

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

 ************************************************************************
  FLOW PROCESS FROM NODE  11001.00 TO NODE  11002.00 IS CODE =  63
 ------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
========================================================================
  UPSTREAM ELEVATION(FEET) = 1385.00  DOWNSTREAM ELEVATION(FEET) = 1382.00
  STREET LENGTH(FEET) =   171.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00
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 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  10.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =      23.29
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.49
   HALFSTREET FLOOD WIDTH(FEET) =   17.96
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.48
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.69
 STREET FLOW TRAVEL TIME(MIN.) =   0.82   Tc(MIN.) =   10.71
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.515
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 PUBLIC PARK                A        1.41      0.98     0.850    32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A        0.24      0.98     0.600    32
 PUBLIC PARK                A        1.96      0.98     0.850    32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.833
 SUBAREA AREA(ACRES) =    3.61      SUBAREA RUNOFF(CFS) =    8.78
 EFFECTIVE AREA(ACRES) =     10.23    AREA-AVERAGED Fm(INCH/HR) =  0.62
 AREA-AVERAGED Fp(INCH/HR) =  0.98  AREA-AVERAGED Ap =  0.64
 TOTAL AREA(ACRES) =       10.2        PEAK FLOW RATE(CFS) =      26.65

 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) = 0.50   HALFSTREET FLOOD WIDTH(FEET) =  18.01
 FLOW VELOCITY(FEET/SEC.) =  3.69   DEPTH*VELOCITY(FT*FT/SEC.) =   1.85
 LONGEST FLOWPATH FROM NODE  11000.00 TO NODE  11002.00 =     775.68 FEET.

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 FLOW PROCESS FROM NODE  11002.00 TO NODE  11003.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1382.00  DOWNSTREAM ELEVATION(FEET) = 1377.00
 STREET LENGTH(FEET) =   241.50   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
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 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) =      32.79
   ***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.) =    4.20
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.17
 STREET FLOW TRAVEL TIME(MIN.) =   0.96   Tc(MIN.) =   11.67
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.339
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 PUBLIC PARK                A        1.71      0.98     0.850    32
 SCHOOL                     A        0.19      0.98     0.600    32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A        0.72      0.98     0.600    32
 MOBILE HOME PARK           A        2.21      0.98     0.250    32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.528
 SUBAREA AREA(ACRES) =    4.83      SUBAREA RUNOFF(CFS) =   12.27
 EFFECTIVE AREA(ACRES) =     15.06    AREA-AVERAGED Fm(INCH/HR) =  0.59
 AREA-AVERAGED Fp(INCH/HR) =  0.98  AREA-AVERAGED Ap =  0.60
 TOTAL AREA(ACRES) =       15.1        PEAK FLOW RATE(CFS) =      37.31

 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) = 0.53   HALFSTREET FLOOD WIDTH(FEET) =  19.66
 FLOW VELOCITY(FEET/SEC.) =  4.41   DEPTH*VELOCITY(FT*FT/SEC.) =   2.35
 LONGEST FLOWPATH FROM NODE  11000.00 TO NODE  11003.00 =    1017.18 FEET.

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 FLOW PROCESS FROM NODE  11003.00 TO NODE  11004.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(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
 STREET HALFWIDTH(FEET) = 18.00

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =      43.25
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
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  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      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
SCHOOL                     A        2.11      0.98     0.600    32
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) =      46.94

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.

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 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      Fp         Ap     SCS
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      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 SCHOOL                     A        2.36      0.98     0.600    32
 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.

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 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 SCHOOL                     A        2.52      0.98     0.600    32
 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
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  AREA-AVERAGED Fp(INCH/HR) =  0.97  AREA-AVERAGED Ap =  0.60
  TOTAL AREA(ACRES) =       32.5        PEAK FLOW RATE(CFS) =      67.80

  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) = 0.64   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
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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 AREA(ACRES) =    9.98      SUBAREA RUNOFF(CFS) =   19.52
  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
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  FLOW VELOCITY(FEET/SEC.) =  5.43   DEPTH*VELOCITY(FT*FT/SEC.) =   3.69
  LONGEST FLOWPATH FROM NODE  11000.00 TO NODE  11007.00 =    2275.27 FEET.

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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        3.55      0.98     0.600    32
  MOBILE HOME PARK           A        0.33      0.98     0.250    32
  SCHOOL                     A        5.45      0.98     0.600    32
  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.

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 FLOW PROCESS FROM NODE  11008.00 TO NODE  11009.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 MOBILE HOME PARK           A        1.94      0.98     0.250    32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A        0.37      0.98     0.600    32
 SCHOOL                     A        3.32      0.98     0.600    32
 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.

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 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
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 STREET HALFWIDTH(FEET) = 18.00

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A       12.60      0.98     0.600    32
 MOBILE HOME PARK           A        7.72      0.98     0.250    32
 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.

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 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
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OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(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
  ***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
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       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
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) =     166.41

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) = 0.93   HALFSTREET FLOOD WIDTH(FEET) =  39.44
FLOW VELOCITY(FEET/SEC.) =  5.23   DEPTH*VELOCITY(FT*FT/SEC.) =   4.85

*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.) =  18.08
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
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  HALFSTREET FLOOD WIDTH(FEET) =   35.35
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.92
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.16
LONGEST FLOWPATH FROM NODE  11000.00 TO NODE  11011.00 =    4755.44 FEET.

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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) =  0.89
  HALFSTREET FLOOD WIDTH(FEET) =   37.54
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.01
  PRODUCT 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):
 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 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) =     209.46

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) = 0.90   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:
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 ** 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.

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 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) =     248.62
   ***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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 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
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 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) =     246.55

 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 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.

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 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
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  **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      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
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"                 A       18.33      0.88     1.000    44
AGRICULTURAL FAIR COVER
"ORCHARDS"                 B        0.15      0.63     1.000    65
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.
```



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****************************************************************************
  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) =     440.22
    ***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      Fp         Ap     SCS
       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"               A        3.04      0.86     1.000    46
  PUBLIC PARK                A        0.17      0.98     0.850    32
  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 **
```

```
  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
```

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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
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                          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

  *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
```



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 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  11100.00 TO NODE  11101.00 IS CODE =  21
 ------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   876.30
  ELEVATION DATA: UPSTREAM(FEET) =   1350.00  DOWNSTREAM(FEET) =   1341.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.419
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.382
  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
  "3-4 DWELLINGS/ACRE"       A        3.15      0.98      0.600    32   15.48
  COMMERCIAL                 A        4.24      0.98      0.100    32   11.42
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A        0.96      0.98      0.500    32   14.61
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.335
  SUBAREA RUNOFF(CFS) =     22.97
  TOTAL AREA(ACRES) =      8.35   PEAK FLOW RATE(CFS) =     22.97

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

 ************************************************************************
  FLOW PROCESS FROM NODE  11101.00 TO NODE  11102.00 IS CODE =  63
 ------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 18 USED)<<<<<
========================================================================
  UPSTREAM ELEVATION(FEET) = 1341.00  DOWNSTREAM ELEVATION(FEET) = 1332.00
  STREET LENGTH(FEET) =   700.50   CURB HEIGHT(INCHES) =  8.0
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  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) =      33.72
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.59
    HALFSTREET FLOOD WIDTH(FEET) =   21.81
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.41
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.03
  STREET FLOW TRAVEL TIME(MIN.) =   3.43   Tc(MIN.) =   14.84
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.890
  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        2.90      0.98     0.600    32
  COMMERCIAL                 A        5.05      0.98     0.100    32
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A        1.27      0.98     0.500    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.312
  SUBAREA AREA(ACRES) =    9.22      SUBAREA RUNOFF(CFS) =   21.45
  EFFECTIVE AREA(ACRES) =     17.57    AREA-AVERAGED Fm(INCH/HR) =  0.31
  AREA-AVERAGED Fp(INCH/HR) =  0.98  AREA-AVERAGED Ap =  0.32
  TOTAL AREA(ACRES) =       17.6        PEAK FLOW RATE(CFS) =      40.72

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

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.63   HALFSTREET FLOOD WIDTH(FEET) =  23.45
  FLOW VELOCITY(FEET/SEC.) =  3.58   DEPTH*VELOCITY(FT*FT/SEC.) =   2.24
  LONGEST FLOWPATH FROM NODE  11100.00 TO NODE  11102.00 =    1576.80 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11102.00 TO NODE  11103.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 18 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1332.00  DOWNSTREAM ELEVATION(FEET) = 1310.00
  STREET LENGTH(FEET) =  1301.53   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
```



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  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        5.95      0.98     0.600    32
  COMMERCIAL                 A        9.58      0.98     0.100    32
  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 =  0.319
  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) =      74.10
    ***STREET FLOWING FULL***
```

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  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.68
  HALFSTREET FLOOD WIDTH(FEET) =   26.79
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.24
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.58
 STREET FLOW TRAVEL TIME(MIN.) =   1.06   Tc(MIN.) =   20.93
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.351
 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        5.14      0.98     0.600    32
 COMMERCIAL                 A        2.30      0.98     0.100    32
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"       A        0.33      0.98     0.500    32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.448
 SUBAREA AREA(ACRES) =    7.77      SUBAREA RUNOFF(CFS) =   13.39
 EFFECTIVE AREA(ACRES) =     43.21    AREA-AVERAGED Fm(INCH/HR) =  0.34
 AREA-AVERAGED Fp(INCH/HR) =  0.98  AREA-AVERAGED Ap =  0.34
 TOTAL AREA(ACRES) =       43.2        PEAK FLOW RATE(CFS) =      78.41

 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) = 0.69   HALFSTREET FLOOD WIDTH(FEET) =  27.22
 FLOW VELOCITY(FEET/SEC.) =  5.37   DEPTH*VELOCITY(FT*FT/SEC.) =   3.71
 LONGEST FLOWPATH FROM NODE  11100.00 TO NODE  11104.00 =    3212.11 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11104.00 TO NODE  11105.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION # 18 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1302.00  DOWNSTREAM ELEVATION(FEET) = 1300.00
 STREET LENGTH(FEET) =   177.15   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) =      82.11
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.77
   HALFSTREET FLOOD WIDTH(FEET) =   31.19
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.27
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.29
 STREET FLOW TRAVEL TIME(MIN.) =   0.69   Tc(MIN.) =   21.62
```



```
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.306
 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        2.52      0.98     0.600    32
 COMMERCIAL                 A        1.59      0.98     0.100    32
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"       A        0.20      0.98     0.500    32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.411
 SUBAREA AREA(ACRES) =    4.31      SUBAREA RUNOFF(CFS) =    7.39
 EFFECTIVE AREA(ACRES) =     47.52    AREA-AVERAGED Fm(INCH/HR) =  0.34
 AREA-AVERAGED Fp(INCH/HR) =  0.97  AREA-AVERAGED Ap =  0.35
 TOTAL AREA(ACRES) =       47.5        PEAK FLOW RATE(CFS) =      84.04

 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) = 0.78   HALFSTREET FLOOD WIDTH(FEET) =  31.43
 FLOW VELOCITY(FEET/SEC.) =  4.30   DEPTH*VELOCITY(FT*FT/SEC.) =   3.34
 LONGEST FLOWPATH FROM NODE  11100.00 TO NODE  11105.00 =    3389.26 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11105.00 TO NODE  11106.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION # 18 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1300.00  DOWNSTREAM ELEVATION(FEET) = 1298.00
 STREET LENGTH(FEET) =   169.00   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) =      87.39
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.78
   HALFSTREET FLOOD WIDTH(FEET) =   31.61
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.42
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.44
 STREET FLOW TRAVEL TIME(MIN.) =   0.64   Tc(MIN.) =   22.26
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.266
 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        2.39      0.98     0.600    32
```

```
  COMMERCIAL                  A        1.44      0.98     0.100    32
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"        A        0.18      0.98     0.500    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.416
  SUBAREA AREA(ACRES) =     4.01      SUBAREA RUNOFF(CFS) =     6.71
  EFFECTIVE AREA(ACRES) =     51.53    AREA-AVERAGED Fm(INCH/HR) =  0.35
  AREA-AVERAGED Fp(INCH/HR) =  0.97  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =       51.5        PEAK FLOW RATE(CFS) =      89.05

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

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.78   HALFSTREET FLOOD WIDTH(FEET) =  31.80
  FLOW VELOCITY(FEET/SEC.) =  4.45   DEPTH*VELOCITY(FT*FT/SEC.) =   3.48
  LONGEST FLOWPATH FROM NODE  11100.00 TO NODE  11106.00 =    3558.26 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11106.00 TO NODE  11107.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 18 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1298.00  DOWNSTREAM ELEVATION(FEET) = 1296.00
  STREET LENGTH(FEET) =   338.82   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) =      95.56
    ***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.) =    3.56
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.14
  STREET FLOW TRAVEL TIME(MIN.) =   1.59   Tc(MIN.) =   23.85
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.174
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  A        2.92      0.98     0.100    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        A        4.86      0.98     0.600    32
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"        A        0.40      0.98     0.500    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.417
  SUBAREA AREA(ACRES) =     8.18      SUBAREA RUNOFF(CFS) =    13.02
```



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  EFFECTIVE AREA(ACRES) =     59.71    AREA-AVERAGED Fm(INCH/HR) =  0.35
  AREA-AVERAGED Fp(INCH/HR) =  0.97  AREA-AVERAGED Ap =  0.36
  TOTAL AREA(ACRES) =       59.7        PEAK FLOW RATE(CFS) =      97.81

  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) = 0.89   HALFSTREET FLOOD WIDTH(FEET) =  37.11
  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.

****************************************************************************
  FLOW PROCESS FROM NODE  11107.00 TO NODE  11108.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(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
  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) =     103.12
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.85
    HALFSTREET FLOOD WIDTH(FEET) =   35.27
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.18
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.56
  STREET FLOW TRAVEL TIME(MIN.) =   1.37   Tc(MIN.) =   25.22
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.103
  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        0.77      0.98     0.600    32
  COMMERCIAL                  A        5.22      0.98     0.100    32
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"        A        0.11      0.98     0.500    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.170
  SUBAREA AREA(ACRES) =     6.10      SUBAREA RUNOFF(CFS) =    10.63
  EFFECTIVE AREA(ACRES) =     65.81    AREA-AVERAGED Fm(INCH/HR) =  0.34
  AREA-AVERAGED Fp(INCH/HR) =  0.97  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =       65.8        PEAK FLOW RATE(CFS) =     104.58

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

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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        2.61      0.98     0.100    32
  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    32
  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
```



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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        3.24      0.98     0.100    32
  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) =     108.98

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

****************************************************************************
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A        5.79      0.98     0.500    32
  COMMERCIAL                 A       12.04      0.98     0.100    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A       12.62      0.98     0.600    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.383
```

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  SUBAREA AREA(ACRES) =   30.45      SUBAREA RUNOFF(CFS) =   41.27
  EFFECTIVE AREA(ACRES) =    106.41   AREA-AVERAGED Fm(INCH/HR) =  0.34
  AREA-AVERAGED Fp(INCH/HR) =  0.98  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =      106.4       PEAK FLOW RATE(CFS) =     147.37

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

****************************************************************************
  FLOW PROCESS FROM NODE  11111.00 TO NODE  11153.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1280.00  DOWNSTREAM(FEET) =   1258.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1287.20   CHANNEL SLOPE =  0.0171
  CHANNEL BASE(FEET) =    8.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   9.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     147.37
  FLOW VELOCITY(FEET/SEC.) =  12.18   FLOW DEPTH(FEET) =   1.17
  TRAVEL TIME(MIN.) =   1.76   Tc(MIN.) =   32.16
  LONGEST FLOWPATH FROM NODE  11100.00 TO NODE  11153.00 =    7147.74 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11153.00 TO NODE  11153.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   32.16
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.817
  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        0.01      0.75     0.500    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A        5.86      0.98     0.500    32
  COMMERCIAL                 A       12.53      0.98     0.100    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.228
  SUBAREA AREA(ACRES) =   18.40      SUBAREA RUNOFF(CFS) =   26.42
  EFFECTIVE AREA(ACRES) =    124.81   AREA-AVERAGED Fm(INCH/HR) =  0.32
  AREA-AVERAGED Fp(INCH/HR) =  0.97  AREA-AVERAGED Ap =  0.33
  TOTAL AREA(ACRES) =      124.8       PEAK FLOW RATE(CFS) =     167.81

  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  11153.00 TO NODE  11153.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11120.00 TO NODE  11121.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```



```
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   880.26
  ELEVATION DATA: UPSTREAM(FEET) =   1395.00  DOWNSTREAM(FEET) =   1390.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   14.234
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.964
  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.)
  MOBILE HOME PARK           A        7.01      0.98     0.250    32   14.23
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        2.73      0.98     0.600    32   17.45
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.348
  SUBAREA RUNOFF(CFS) =     23.00
  TOTAL AREA(ACRES) =      9.74   PEAK FLOW RATE(CFS) =     23.00

  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  11121.00 TO NODE  11122.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1390.00  DOWNSTREAM ELEVATION(FEET) = 1388.00
  STREET LENGTH(FEET) =   185.87   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) =      30.65
    ***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.) =    3.31
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.83
  STREET FLOW TRAVEL TIME(MIN.) =   0.93   Tc(MIN.) =   15.17
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.853
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           A        5.06      0.98     0.250    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        1.67      0.98     0.600    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
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  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.337
  SUBAREA AREA(ACRES) =    6.73      SUBAREA RUNOFF(CFS) =   15.29
  EFFECTIVE AREA(ACRES) =     16.47    AREA-AVERAGED Fm(INCH/HR) =  0.33
  AREA-AVERAGED Fp(INCH/HR) =  0.98  AREA-AVERAGED Ap =  0.34
  TOTAL AREA(ACRES) =       16.5        PEAK FLOW RATE(CFS) =      37.32

  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) = 0.58   HALFSTREET FLOOD WIDTH(FEET) =  22.16
  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,
         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.

****************************************************************************
  FLOW PROCESS FROM NODE  11122.00 TO NODE  11123.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1388.00  DOWNSTREAM ELEVATION(FEET) = 1385.00
  STREET LENGTH(FEET) =   198.64   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) =      45.16
    ***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.) =    4.21
    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
  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        1.33      0.98     0.600    32
  MOBILE HOME PARK           A        5.75      0.98     0.250    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.316
  SUBAREA AREA(ACRES) =    7.08      SUBAREA RUNOFF(CFS) =   15.67
  EFFECTIVE AREA(ACRES) =     23.55    AREA-AVERAGED Fm(INCH/HR) =  0.33
  AREA-AVERAGED Fp(INCH/HR) =  0.98  AREA-AVERAGED Ap =  0.34
  TOTAL AREA(ACRES) =       23.5        PEAK FLOW RATE(CFS) =      51.73
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  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.) =  4.39   DEPTH*VELOCITY(FT*FT/SEC.) =   2.68
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  198.6 FT WITH ELEVATION-DROP =   3.0 FT, IS   28.4 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE  11123.00
  LONGEST FLOWPATH FROM NODE  11120.00 TO NODE  11123.00 =    1264.77 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11123.00 TO NODE  11124.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1385.00  DOWNSTREAM ELEVATION(FEET) = 1380.00
  STREET LENGTH(FEET) =   331.32   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) =   0.90

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      63.64
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.65
    HALFSTREET FLOOD WIDTH(FEET) =   25.40
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.67
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.02
  STREET FLOW TRAVEL TIME(MIN.) =   1.18   Tc(MIN.) =   17.14
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.651
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           A        8.87      0.98     0.250    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        2.48      0.98     0.600    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.326
  SUBAREA AREA(ACRES) =   11.35      SUBAREA RUNOFF(CFS) =   23.83
  EFFECTIVE AREA(ACRES) =     34.90    AREA-AVERAGED Fm(INCH/HR) =  0.32
  AREA-AVERAGED Fp(INCH/HR) =  0.97  AREA-AVERAGED Ap =  0.33
  TOTAL AREA(ACRES) =       34.9        PEAK FLOW RATE(CFS) =      73.10

  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:
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  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.

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

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  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     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A       21.92      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) =   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.

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  FLOW PROCESS FROM NODE  11126.00 TO NODE  11127.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
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  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1359.00  DOWNSTREAM ELEVATION(FEET) = 1355.00
  STREET LENGTH(FEET) =   316.50   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) =     133.05
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.84
    HALFSTREET FLOOD WIDTH(FEET) =   35.10
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.24
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.41
  STREET FLOW TRAVEL TIME(MIN.) =   1.01   Tc(MIN.) =   20.86
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.356
  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       11.22      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) =   11.22      SUBAREA RUNOFF(CFS) =   17.88
  EFFECTIVE AREA(ACRES) =     79.74    AREA-AVERAGED Fm(INCH/HR) =  0.44
  AREA-AVERAGED Fp(INCH/HR) =  0.98  AREA-AVERAGED Ap =  0.45
  TOTAL AREA(ACRES) =       79.7        PEAK FLOW RATE(CFS) =     137.62

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

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.85   HALFSTREET FLOOD WIDTH(FEET) =  35.53
  FLOW VELOCITY(FEET/SEC.) =  5.30   DEPTH*VELOCITY(FT*FT/SEC.) =   4.51
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  316.5 FT WITH ELEVATION-DROP =   4.0 FT, IS   31.3 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE  11127.00
  LONGEST FLOWPATH FROM NODE  11120.00 TO NODE  11127.00 =    2881.12 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11127.00 TO NODE  11128.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>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
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  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  10.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A       28.58      0.98     0.600    32
  MOBILE HOME PARK           B       12.99      0.75     0.250    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       12.02      0.75     0.600    56
  COMMERCIAL                 A        7.04      0.98     0.100    32
  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    32
  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
  TOTAL AREA(ACRES) =      147.2        PEAK FLOW RATE(CFS) =     253.66
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  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.

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  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
  COMMERCIAL                 A        1.26      0.98     0.100    32
  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
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  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 Tc :
  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.

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  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
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  AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.60
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    7.03
STREET FLOW TRAVEL TIME(MIN.) =   1.71   Tc(MIN.) =   23.25
* 100 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
SCHOOL                     A        1.18      0.98     0.600    32
RESIDENTIAL
"3-4 DWELLINGS/ACRE"       A        5.90      0.98     0.600    32
COMMERCIAL                 A        2.75      0.98     0.100    32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.460
SUBAREA AREA(ACRES) =    9.83      SUBAREA RUNOFF(CFS) =   15.56
EFFECTIVE AREA(ACRES) =    169.16    AREA-AVERAGED Fm(INCH/HR) =  0.44
AREA-AVERAGED Fp(INCH/HR) =  0.94  AREA-AVERAGED Ap =  0.47
TOTAL AREA(ACRES) =      169.2        PEAK FLOW RATE(CFS) =     269.61

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

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 1.06   HALFSTREET FLOOD WIDTH(FEET) =  45.47
FLOW VELOCITY(FEET/SEC.) =  6.56   DEPTH*VELOCITY(FT*FT/SEC.) =   6.92

*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.00
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.) =  27.55
PIPE-FLOW(CFS) =     194.94
PIPEFLOW TRAVEL TIME(MIN.) =   0.41    Tc(MIN.) =  21.96
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.285
SUBAREA AREA(ACRES) =    9.83      SUBAREA RUNOFF(CFS) =   16.24
TOTAL AREA(ACRES) =      169.2        PEAK FLOW RATE(CFS) =     281.39

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =   86.45
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.75
  HALFSTREET FLOOD WIDTH(FEET) =   30.33
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.76
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.58
LONGEST FLOWPATH FROM NODE  11120.00 TO NODE  11130.00 =    4536.54 FEET.

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  FLOW PROCESS FROM NODE  11130.00 TO NODE  11131.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 18 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1335.00  DOWNSTREAM ELEVATION(FEET) = 1320.00
  STREET LENGTH(FEET) =  1010.00   CURB HEIGHT(INCHES) =  8.0
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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) =     291.71
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  1.08
  HALFSTREET FLOOD WIDTH(FEET) =   46.75
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.71
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    7.26
STREET FLOW TRAVEL TIME(MIN.) =   2.51   Tc(MIN.) =   24.47
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.141
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       14.65      0.98     0.600    32
SCHOOL                     A        0.09      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) =   14.74      SUBAREA RUNOFF(CFS) =   20.64
EFFECTIVE AREA(ACRES) =    183.90    AREA-AVERAGED Fm(INCH/HR) =  0.45
AREA-AVERAGED Fp(INCH/HR) =  0.94  AREA-AVERAGED Ap =  0.48
TOTAL AREA(ACRES) =      183.9        PEAK FLOW RATE(CFS) =     281.39
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

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

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 1.07   HALFSTREET FLOOD WIDTH(FEET) =  46.14
FLOW VELOCITY(FEET/SEC.) =  6.64   DEPTH*VELOCITY(FT*FT/SEC.) =   7.10

*NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
       THE MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 1.00
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.) =  27.60
PIPE-FLOW(CFS) =     195.25
PIPEFLOW TRAVEL TIME(MIN.) =   0.61    Tc(MIN.) =  22.57
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.248
SUBAREA AREA(ACRES) =   14.74      SUBAREA RUNOFF(CFS) =   22.06
TOTAL AREA(ACRES) =      183.9        PEAK FLOW RATE(CFS) =     297.77

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 :
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  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =  102.52
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.79
    HALFSTREET FLOOD WIDTH(FEET) =   32.10
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.03
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.97
  LONGEST FLOWPATH FROM NODE  11120.00 TO NODE  11131.00 =    5546.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11131.00 TO NODE  11132.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 18 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1320.00  DOWNSTREAM ELEVATION(FEET) = 1311.00
  STREET LENGTH(FEET) =  1001.00   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) =   1.07

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     376.65
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  1.28
    HALFSTREET FLOOD WIDTH(FEET) =   56.70
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.88
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    7.53
  STREET FLOW TRAVEL TIME(MIN.) =   2.84   Tc(MIN.) =   25.41
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.093
  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      100.00      0.98     0.600    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        9.46      0.98     0.600    32
  COMMERCIAL                 A        5.02      0.98     0.100    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.578
  SUBAREA AREA(ACRES) =  114.48      SUBAREA RUNOFF(CFS) =  157.61
  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) =     429.86

  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) = 1.34   HALFSTREET FLOOD WIDTH(FEET) =  59.63
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  FLOW VELOCITY(FEET/SEC.) =  6.06   DEPTH*VELOCITY(FT*FT/SEC.) =   8.12

  *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) =  45.00    NUMBER OF PIPES =   1
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  24.92
  PIPE-FLOW(CFS) =     275.47
  PIPEFLOW TRAVEL TIME(MIN.) =   0.67    Tc(MIN.) =  23.24
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.208
  SUBAREA AREA(ACRES) =  114.48      SUBAREA RUNOFF(CFS) =  169.47
  TOTAL AREA(ACRES) =      298.4        PEAK FLOW RATE(CFS) =     460.78

  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 Tc :
  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =  185.31
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  1.01
    HALFSTREET FLOOD WIDTH(FEET) =   43.39
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.95
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.02
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  1001.0 FT WITH ELEVATION-DROP =   9.0 FT, IS  274.1 CFS,
         WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE  11132.00
  LONGEST FLOWPATH FROM NODE  11120.00 TO NODE  11132.00 =    6547.54 FEET.

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  FLOW PROCESS FROM NODE  11132.00 TO NODE  11152.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 18 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1311.00  DOWNSTREAM ELEVATION(FEET) = 1300.00
  STREET LENGTH(FEET) =   662.69   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 =  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) =   0.97

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     460.78
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  1.24
    HALFSTREET FLOOD WIDTH(FEET) =   54.44
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.80
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    9.64
  STREET FLOW TRAVEL TIME(MIN.) =   1.42   Tc(MIN.) =   24.65
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 * 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
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----------------------------------------------------------------------------
 >>>>>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 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.)
 MOBILE HOME PARK           A        6.95      0.98     0.250    32   11.41
 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

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      34.93
   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      Fp         Ap      SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 MOBILE HOME PARK           A        6.77      0.98     0.250    32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A        0.43      0.98     0.600    32
```

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  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) =      43.77

  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) =      53.65
    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
  MOBILE HOME PARK           A        6.51      0.98     0.250    32
  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
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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        1.42      0.98     0.600    32
  MOBILE HOME PARK           A        5.96      0.98     0.250    32
  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
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  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1375.00  DOWNSTREAM ELEVATION(FEET) = 1370.00
  STREET LENGTH(FEET) =   313.00   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) =   1.01

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      91.93
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.77
    HALFSTREET FLOOD WIDTH(FEET) =   36.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.64
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.59
  STREET FLOW TRAVEL TIME(MIN.) =   1.12   Tc(MIN.) =   14.75
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.901
  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        3.01      0.98     0.600    32
  MOBILE HOME PARK           A        9.39      0.98     0.250    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.335
  SUBAREA AREA(ACRES) =   12.40      SUBAREA RUNOFF(CFS) =   28.73
  EFFECTIVE AREA(ACRES) =     43.84    AREA-AVERAGED Fm(INCH/HR) =  0.31
  AREA-AVERAGED Fp(INCH/HR) =  0.98  AREA-AVERAGED Ap =  0.32
  TOTAL AREA(ACRES) =       43.8        PEAK FLOW RATE(CFS) =     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

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.80   HALFSTREET FLOOD WIDTH(FEET) =  38.50
  FLOW VELOCITY(FEET/SEC.) =  4.72   DEPTH*VELOCITY(FT*FT/SEC.) =   3.77
  LONGEST FLOWPATH FROM NODE  11140.00 TO NODE  11145.00 =    1691.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11145.00 TO NODE  11146.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1370.00  DOWNSTREAM ELEVATION(FEET) = 1365.00
  STREET LENGTH(FEET) =   291.50   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
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  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow 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) =     112.38
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.81
    HALFSTREET FLOOD WIDTH(FEET) =   39.10
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.99
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.03
  STREET FLOW TRAVEL TIME(MIN.) =   0.97   Tc(MIN.) =   15.73
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.791
  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        9.51      0.98     0.600    32
  MOBILE HOME PARK           A        0.56      0.98     0.250    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.581
  SUBAREA AREA(ACRES) =   10.07      SUBAREA RUNOFF(CFS) =   20.17
  EFFECTIVE AREA(ACRES) =     53.91    AREA-AVERAGED Fm(INCH/HR) =  0.36
  AREA-AVERAGED Fp(INCH/HR) =  0.98  AREA-AVERAGED Ap =  0.37
  TOTAL AREA(ACRES) =       53.9        PEAK FLOW RATE(CFS) =     118.16

  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) = 0.82   HALFSTREET FLOOD WIDTH(FEET) =  39.58
  FLOW VELOCITY(FEET/SEC.) =  5.07   DEPTH*VELOCITY(FT*FT/SEC.) =   4.15
  LONGEST FLOWPATH FROM NODE  11140.00 TO NODE  11146.00 =    1982.90 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11146.00 TO NODE  11147.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1365.00  DOWNSTREAM ELEVATION(FEET) = 1357.00
  STREET LENGTH(FEET) =   397.50   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) =   0.96
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  **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         Ap     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
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 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 SCHOOL                     A        0.05      0.98     0.600    32
 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):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 SCHOOL                     A        0.20      0.98     0.600    32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A        5.51      0.98     0.600    32
 COMMERCIAL                 A        0.19      0.98     0.100    32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        7.86      0.98     0.600    32
  SCHOOL                     A        4.14      0.98     0.600    32
  COMMERCIAL                 A        0.51      0.98     0.100    32
  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):
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  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) =  36.01
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A       23.26      0.98     0.600    32
  SCHOOL                     A        0.04      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) =   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.

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 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         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A       15.99      0.98     0.600    32
 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 =  0.50
 TOTAL 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:
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 TIME OF CONCENTRATION(MIN.) =   26.71
 RAINFALL INTENSITY(INCH/HR) =   2.03
 AREA-AVERAGED Fm(INCH/HR) =  0.48
 AREA-AVERAGED Fp(INCH/HR) =  0.97
 AREA-AVERAGED Ap =  0.50
 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

 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      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.) =    23.58
 EFFECTIVE 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
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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):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
COMMERCIAL                 A       27.28      0.98     0.100    32
MOBILE HOME PARK           A       16.76      0.98     0.250    32
RESIDENTIAL
"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
RESIDENTIAL
"3-4 DWELLINGS/ACRE"       B        0.69      0.75     0.600    56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.96
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.250
SUBAREA AREA(ACRES) =   59.19      SUBAREA RUNOFF(CFS) =   90.94
EFFECTIVE AREA(ACRES) =    466.89    AREA-AVERAGED Fm(INCH/HR) =  0.46
AREA-AVERAGED Fp(INCH/HR) =  0.96  AREA-AVERAGED Ap =  0.48
TOTAL AREA(ACRES) =      481.4        PEAK FLOW RATE(CFS) =     628.71
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) = 1.38   HALFSTREET FLOOD WIDTH(FEET) =  61.58
FLOW VELOCITY(FEET/SEC.) =  8.31   DEPTH*VELOCITY(FT*FT/SEC.) =  11.46

*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 CARRY TOTAL UPSTREAM PIPEFLOW **
ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY(FEET/SEC.) =  36.45
PIPE-FLOW(CFS) =     517.54
PIPEFLOW TRAVEL TIME(MIN.) =   1.18    Tc(MIN.) =  24.76
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.126
SUBAREA AREA(ACRES) =   59.19      SUBAREA RUNOFF(CFS) =  100.47
TOTAL AREA(ACRES) =      481.4        PEAK FLOW RATE(CFS) =     700.82

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) =  183.29
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.92
  HALFSTREET FLOOD WIDTH(FEET) =   38.75
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.15
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.67

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      700.82   24.76    2.126  0.96( 0.46) 0.48     466.9   11120.00
    2      657.91   27.94    1.977  0.96( 0.46) 0.48     481.4   11140.00
NEW PEAK FLOW DATA ARE:
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  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
  LONGEST FLOWPATH FROM NODE  11120.00 TO NODE  11153.00 =    9790.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11153.00 TO NODE  11153.00 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      700.82   24.76    2.126  0.96( 0.46) 0.48     466.9   11120.00
      2      657.91   27.94    1.977  0.96( 0.46) 0.48     481.4   11140.00
  LONGEST FLOWPATH FROM NODE  11120.00 TO NODE  11153.00 =    9790.33 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      167.81   32.16    1.817  0.97( 0.32) 0.33     124.8   11100.00
  LONGEST FLOWPATH FROM NODE  11100.00 TO NODE  11153.00 =    7147.74 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      856.71   24.76    2.126  0.96( 0.44) 0.45     563.0   11120.00
      2      819.31   27.94    1.977  0.96( 0.43) 0.45     589.8   11140.00
      3      756.29   32.16    1.817  0.96( 0.43) 0.45     606.2   11100.00
    TOTAL AREA(ACRES) =       606.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      856.71  Tc(MIN.) =   24.758
  EFFECTIVE AREA(ACRES) =    562.97  AREA-AVERAGED Fm(INCH/HR) =  0.44
  AREA-AVERAGED Fp(INCH/HR) =  0.96  AREA-AVERAGED Ap =  0.45
  TOTAL AREA(ACRES) =      606.2
  LONGEST FLOWPATH FROM NODE  11120.00 TO NODE  11153.00 =    9790.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11153.00 TO NODE  11153.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  11153.00 TO NODE  11154.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1258.00  DOWNSTREAM(FEET) =   1257.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1299.38   CHANNEL SLOPE =  0.0008
  CHANNEL BASE(FEET) =    8.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   9.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     856.71
  FLOW VELOCITY(FEET/SEC.) =   6.48   FLOW DEPTH(FEET) =   6.37
  TRAVEL TIME(MIN.) =   3.34   Tc(MIN.) =   28.10
```

```
  LONGEST FLOWPATH FROM NODE  11120.00 TO NODE  11154.00 =   11089.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11154.00 TO NODE  11154.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   28.10
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.970
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       18.88      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A       18.38      0.98     0.600    32
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B       14.24      0.75     0.500    56
  COMMERCIAL                 A       13.60      0.98     0.100    32
  MOBILE HOME PARK           A       10.81      0.98     0.250    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        6.56      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.87
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.340
  SUBAREA AREA(ACRES) =   82.47      SUBAREA RUNOFF(CFS) =  124.30
  EFFECTIVE AREA(ACRES) =    645.44   AREA-AVERAGED Fm(INCH/HR) =  0.42
  AREA-AVERAGED Fp(INCH/HR) =  0.95  AREA-AVERAGED Ap =  0.44
  TOTAL AREA(ACRES) =      688.7       PEAK FLOW RATE(CFS) =     902.20

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.40

****************************************************************************
  FLOW PROCESS FROM NODE  11154.00 TO NODE  11154.00 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= 0.42;30M= 0.87;1H= 1.14;3H= 1.86;6H= 2.52;24H= 4.97
  S-GRAPH: VALLEY(DEV.)=100.0%;VALLEY(UNDEV.)/DESERT=  0.0%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.47; LAG(HR) = 0.37; Fm(INCH/HR) = 0.41; Ybar = 0.45
  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) =      688.7
  LONGEST FLOWPATH FROM NODE  11120.00 TO NODE  11154.00 =   11089.71 FEET.
   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
  TIME OF PEAK FLOW(HR) = 16.42  RUNOFF VOLUME(AF) =     166.68
  UNIT-HYDROGRAPH METHOD PEAK FLOW RATE(CFS) =    934.56
  TOTAL PEAK FLOW RATE(CFS) =    934.56 (SOURCE FLOW INCLUDED)
  RATIONAL METHOD PEAK FLOW RATE(CFS) =    902.20
   (UPSTREAM NODE PEAK FLOW RATE(CFS) =    902.20)
  PEAK FLOW RATE(CFS) USED =    934.56

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



```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1257.00  DOWNSTREAM(FEET) =   1252.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1418.25   CHANNEL SLOPE =  0.0035
  CHANNEL BASE(FEET) =    8.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   9.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     934.56
  FLOW VELOCITY(FEET/SEC.) =  11.65   FLOW DEPTH(FEET) =   4.64
  TRAVEL TIME(MIN.) =   2.03   Tc(MIN.) =   30.13
  LONGEST FLOWPATH FROM NODE  11120.00 TO NODE  11155.00 =   12507.96 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11155.00 TO NODE  11155.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   30.13
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.890
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       28.26      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       18.98      0.75     0.600    56
  MOBILE HOME PARK           B       14.02      0.75     0.250    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B       12.58      0.75     0.500    56
  MOBILE HOME PARK           A       11.82      0.98     0.250    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        3.32      0.98     0.600    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.79
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.325
  SUBAREA AREA(ACRES) =   88.98
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.41;30M= 0.84;1H= 1.11;3H= 1.81;6H= 2.45;24H= 4.80
  S-GRAPH: VALLEY(DEV.)=100.0%;VALLEY(UNDEV.)/DESERT=  0.0%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.50; LAG(HR) = 0.40; Fm(INCH/HR) = 0.40; Ybar = 0.44
  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) =      777.7
  LONGEST FLOWPATH FROM NODE  11120.00 TO NODE  11155.00 =   12507.96 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) = 16.50  RUNOFF VOLUME(AF) =     185.63
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =     945.58
  TOTAL AREA(ACRES) =      777.7       PEAK FLOW RATE(CFS) =     945.58

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  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
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1252.00  DOWNSTREAM(FEET) =   1250.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1431.00   CHANNEL SLOPE =  0.0014
  CHANNEL BASE(FEET) =    8.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   9.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     945.58
  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  11156.00 TO NODE  11156.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   33.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.789
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A       26.66      0.98     0.100    32
  COMMERCIAL                 B       29.20      0.75     0.100    56
  MOBILE HOME PARK           A        5.04      0.98     0.250    32
  MOBILE HOME PARK           B        3.45      0.75     0.250    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B       21.44      0.75     0.500    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        5.28      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.79
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.237
  SUBAREA AREA(ACRES) =   91.07
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.40;30M= 0.82;1H= 1.08;3H= 1.76;6H= 2.39;24H= 4.66
  S-GRAPH: VALLEY(DEV.)=100.0%;VALLEY(UNDEV.)/DESERT=  0.0%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.55; LAG(HR) = 0.44; Fm(INCH/HR) = 0.37; Ybar = 0.42
  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) =      868.7
  LONGEST FLOWPATH FROM NODE  11120.00 TO NODE  11156.00 =   13938.96 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0297; Lca/L=0.4,n=.0266; Lca/L=0.5,n=.0244;Lca/L=0.6,n=.0228
  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 = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.50

****************************************************************************
  FLOW PROCESS FROM NODE  11156.00 TO NODE  11157.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1250.00  DOWNSTREAM(FEET) =   1240.00
```



```
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2187.11   CHANNEL SLOPE =  0.0046
  CHANNEL BASE(FEET) =    8.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   9.00
  CHANNEL FLOW THRU SUBAREA(CFS) =    1003.91
  FLOW VELOCITY(FEET/SEC.) =  13.07   FLOW DEPTH(FEET) =   4.51
  TRAVEL TIME(MIN.) =   2.79   Tc(MIN.) =   35.79
  LONGEST FLOWPATH FROM NODE  11120.00 TO NODE  11157.00 =   16126.07 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11157.00 TO NODE  11157.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   35.79
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.704
  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        5.40      0.75     0.600    56
  COMMERCIAL                 B      100.00      0.75     0.100    56
  COMMERCIAL                 B        2.71      0.75     0.100    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        8.39      0.75     0.500    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        1.54      0.98     0.600    32
  COMMERCIAL                 A       26.33      0.98     0.100    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.79
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.147
  SUBAREA AREA(ACRES) =  144.37
  UNIT-HYDROGRAPH DATA:
  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%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.60; LAG(HR) = 0.48; Fm(INCH/HR) = 0.34; Ybar = 0.38
  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) =     1013.1
  LONGEST FLOWPATH FROM NODE  11120.00 TO NODE  11157.00 =   16126.07 FEET.
   EQUIVALENT 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) = 16.50  RUNOFF VOLUME(AF) =     261.71
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    1147.05
  TOTAL AREA(ACRES) =     1013.1       PEAK FLOW RATE(CFS) =    1147.05

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

****************************************************************************
  FLOW PROCESS FROM NODE  11157.00 TO NODE  11158.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>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
  CHANNEL BASE(FEET) =    8.00   "Z" FACTOR =   2.000
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       84.86      0.75     0.100    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.58      0.61     1.000    66
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        3.91      0.75     0.500    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.52      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.) =     36.80
  AREA-AVERAGED Fm(INCH/HR)=  0.32   Ybar =  0.36
  PEAK FLOW RATE(CFS)   =   1246.31
============================================================================
============================================================================
  END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

```
 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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                          Analysis prepared by:

                              RBF Consulting
                            14257 Alton Parkway
                                 Irvine, CA
                                   92618

 ************************** DESCRIPTION OF STUDY **************************
* 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:
========================================================================
                    --*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 0.0313 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
```



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 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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   17.080
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.654
  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
  "5-7 DWELLINGS/ACRE"       B        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) =     17.75
  TOTAL AREA(ACRES) =      8.65   PEAK FLOW RATE(CFS) =     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
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  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
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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) =      34.24

  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
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  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
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  END OF SUBAREA "V" GUTTER HYDRAULICS:
  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):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B       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      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
```

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  "3-4 DWELLINGS/ACRE"       B        1.24      0.75     0.600    56
  COMMERCIAL                 B       18.77      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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.81      0.75     0.600    56
  COMMERCIAL                 B        6.99      0.75     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.152
```



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  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 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
  "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
----------------------------------------------------------------------------
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  >>>>>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         Ap     SCS
       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
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  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow 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) =      27.86
    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A        1.00      0.98     0.500    32
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 A        2.32      0.88     1.000    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
  COMMERCIAL                 A        0.25      0.98     0.100    32
  COMMERCIAL                 B        4.52      0.75     0.100    56
  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
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  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow 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) =      56.64
    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        4.75      0.98     0.100    32
  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
  COMMERCIAL                 B        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) =      73.10

  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) = 39.00

  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
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  Manning's FRICTION FACTOR for Streetflow 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) =     108.50
    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A       24.86      0.98     0.100    32
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 A        1.07      0.88     1.000    44
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        0.93      0.98     0.600    32
  COMMERCIAL                 B        8.86      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
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  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     153.90
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.94
  HALFSTREET FLOOD WIDTH(FEET) =   52.79
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.41
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.15
 STREET FLOW TRAVEL TIME(MIN.) =   2.69   Tc(MIN.) =   23.92
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.169
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 A       10.02      0.98     0.100    32
 COMMERCIAL                 B        7.05      0.75     0.100    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A        0.51      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) =  0.87
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.131
 SUBAREA AREA(ACRES) =   18.18      SUBAREA RUNOFF(CFS) =   33.62
 EFFECTIVE AREA(ACRES) =     90.69    AREA-AVERAGED Fm(INCH/HR) =  0.21
 AREA-AVERAGED Fp(INCH/HR) =  0.78  AREA-AVERAGED Ap =  0.26
 TOTAL AREA(ACRES) =       90.7        PEAK FLOW RATE(CFS) =     160.21

 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) = 0.95   HALFSTREET FLOOD WIDTH(FEET) =  53.22
 FLOW VELOCITY(FEET/SEC.) =  4.47   DEPTH*VELOCITY(FT*FT/SEC.) =   4.25
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  711.0 FT WITH ELEVATION-DROP =   8.0 FT, IS   56.9 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE  11216.00
 LONGEST FLOWPATH FROM NODE  11210.00 TO NODE  11216.00 =    3362.12 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11216.00 TO NODE  11216.00 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.) =   23.92
 RAINFALL INTENSITY(INCH/HR) =   2.17
 AREA-AVERAGED Fm(INCH/HR) =  0.21
 AREA-AVERAGED Fp(INCH/HR) =  0.78
 AREA-AVERAGED Ap =  0.26
 EFFECTIVE STREAM AREA(ACRES) =      90.69
 TOTAL STREAM AREA(ACRES) =      90.69
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     160.21

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1      131.93   31.01    1.856  0.75( 0.13) 0.17      80.8   11200.00
```



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     2      160.21   23.92    2.169  0.78( 0.21) 0.26      90.7   11210.00

 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      280.41   23.92    2.169  0.77( 0.17) 0.23     153.0   11210.00
     2      266.60   31.01    1.856  0.77( 0.17) 0.22     171.5   11200.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     280.41    Tc(MIN.) =    23.92
 EFFECTIVE AREA(ACRES) =     153.01   AREA-AVERAGED Fm(INCH/HR) =  0.17
 AREA-AVERAGED Fp(INCH/HR) =  0.77  AREA-AVERAGED Ap =  0.23
 TOTAL AREA(ACRES) =      171.5
 LONGEST FLOWPATH FROM NODE  11200.00 TO NODE  11216.00 =    4465.57 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11216.00 TO NODE  11228.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION # 12 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1210.00  DOWNSTREAM ELEVATION(FEET) = 1209.00
 STREET LENGTH(FEET) =  1455.69   CURB HEIGHT(INCHES) =  8.0
 STREET HALFWIDTH(FEET) = 24.00

 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) =     285.00
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  1.84
  HALFSTREET FLOOD WIDTH(FEET) =   82.91
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.05
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.78
 STREET FLOW TRAVEL TIME(MIN.) =  11.85   Tc(MIN.) =   35.77
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.704
 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        1.02      0.75     0.600    56
 COMMERCIAL                 B        1.91      0.75     0.100    56
 COMMERCIAL                 A        3.22      0.98     0.100    32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A        0.57      0.98     0.600    32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.85
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.218
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  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
----------------------------------------------------------------------------
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```
  >>>>>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 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.)
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                A        2.72      0.88     1.000    44   18.89
  COMMERCIAL                B        1.97      0.75     0.100    56    8.13
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"      B        1.96      0.75     0.500    56   10.41
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"      A        0.87      0.98     0.500    32   10.41
  COMMERCIAL                A        0.41      0.98     0.100    32    8.13
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"      B        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
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 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.911
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                B        0.04      0.75     0.100    56
 COMMERCIAL                A        1.72      0.98     0.100    32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"      A        0.16      0.98     0.600    32
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                A        1.26      0.88     1.000    44
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.90
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.482
 SUBAREA AREA(ACRES) =    3.18      SUBAREA RUNOFF(CFS) =    9.96
 EFFECTIVE AREA(ACRES) =     11.49    AREA-AVERAGED Fm(INCH/HR) =  0.46
 AREA-AVERAGED Fp(INCH/HR) =  0.86  AREA-AVERAGED Ap =  0.53
 TOTAL AREA(ACRES) =       11.5        PEAK FLOW RATE(CFS) =      35.69

 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) = 0.57   HALFSTREET FLOOD WIDTH(FEET) =  21.49
 FLOW VELOCITY(FEET/SEC.) =  3.58   DEPTH*VELOCITY(FT*FT/SEC.) =   2.04
 LONGEST FLOWPATH FROM NODE  11220.00 TO NODE  11222.00 =     628.35 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11222.00 TO NODE  11223.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1241.00  DOWNSTREAM ELEVATION(FEET) = 1239.00
 STREET LENGTH(FEET) =   199.00   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) =      41.84
   ***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.) =    3.57
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.17
 STREET FLOW TRAVEL TIME(MIN.) =   0.93   Tc(MIN.) =    9.88
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.686
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                A        3.62      0.98     0.100    32
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 COMMERCIAL                B        0.02      0.75     0.100    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"      A        0.19      0.98     0.600    32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.125
 SUBAREA AREA(ACRES) =    3.83      SUBAREA RUNOFF(CFS) =   12.29
 EFFECTIVE AREA(ACRES) =     15.32    AREA-AVERAGED Fm(INCH/HR) =  0.38
 AREA-AVERAGED Fp(INCH/HR) =  0.87  AREA-AVERAGED Ap =  0.43
 TOTAL AREA(ACRES) =       15.3        PEAK FLOW RATE(CFS) =      45.65

 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) = 0.62   HALFSTREET FLOOD WIDTH(FEET) =  24.24
 FLOW VELOCITY(FEET/SEC.) =  3.66   DEPTH*VELOCITY(FT*FT/SEC.) =   2.28
 LONGEST FLOWPATH FROM NODE  11220.00 TO NODE  11223.00 =     827.35 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11223.00 TO NODE  11224.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1239.00  DOWNSTREAM ELEVATION(FEET) = 1235.00
 STREET LENGTH(FEET) =   319.58   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) =   0.90

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      54.41
   ***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.) =    4.16
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.65
 STREET FLOW TRAVEL TIME(MIN.) =   1.28   Tc(MIN.) =   11.16
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.426
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                B        0.50      0.75     0.100    56
 COMMERCIAL                A        5.09      0.98     0.100    32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"      A        0.30      0.98     0.600    32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.96
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.125
 SUBAREA AREA(ACRES) =    5.89      SUBAREA RUNOFF(CFS) =   17.52
 EFFECTIVE AREA(ACRES) =     21.21    AREA-AVERAGED Fm(INCH/HR) =  0.30
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 AREA-AVERAGED Fp(INCH/HR) =  0.88  AREA-AVERAGED Ap =  0.35
 TOTAL AREA(ACRES) =       21.2        PEAK FLOW RATE(CFS) =      59.59

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

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.65   HALFSTREET FLOOD WIDTH(FEET) =  25.70
 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
 LONGEST FLOWPATH FROM NODE  11220.00 TO NODE  11224.00 =    1146.93 FEET.

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 FLOW PROCESS FROM NODE  11224.00 TO NODE  11225.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1235.00  DOWNSTREAM ELEVATION(FEET) = 1230.00
 STREET LENGTH(FEET) =   327.08   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 18.00

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =      68.52
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.66
   HALFSTREET FLOOD WIDTH(FEET) =   26.07
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.78
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.16
 STREET FLOW TRAVEL TIME(MIN.) =   1.14   Tc(MIN.) =   12.30
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.232
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B        1.45      0.75     0.100    56
 COMMERCIAL                 A        4.60      0.98     0.100    32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A        0.32      0.98     0.600    32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.93
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.125
 SUBAREA AREA(ACRES) =    6.37      SUBAREA RUNOFF(CFS) =   17.86
 EFFECTIVE AREA(ACRES) =     27.58    AREA-AVERAGED Fm(INCH/HR) =  0.26
 AREA-AVERAGED Fp(INCH/HR) =  0.88  AREA-AVERAGED Ap =  0.30
 TOTAL AREA(ACRES) =       27.6        PEAK FLOW RATE(CFS) =      73.75

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
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 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) =  26.86
 FLOW VELOCITY(FEET/SEC.) =  4.86   DEPTH*VELOCITY(FT*FT/SEC.) =   3.29
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  327.1 FT WITH ELEVATION-DROP =   5.0 FT, IS   25.1 CFS,
        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 PROCESS FROM NODE  11225.00 TO NODE  11226.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1230.00  DOWNSTREAM ELEVATION(FEET) = 1222.00
 STREET LENGTH(FEET) =   398.06   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) =      83.52
   ***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.) =    5.56
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.75
 STREET FLOW TRAVEL TIME(MIN.) =   1.19   Tc(MIN.) =   13.50
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.057
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B        3.44      0.75     0.100    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A        0.04      0.98     0.600    32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        0.34      0.75     0.600    56
 COMMERCIAL                 A        3.54      0.98     0.100    32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.84
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.126
 SUBAREA AREA(ACRES) =    7.36      SUBAREA RUNOFF(CFS) =   19.55
 EFFECTIVE AREA(ACRES) =     34.94    AREA-AVERAGED Fm(INCH/HR) =  0.23
 AREA-AVERAGED Fp(INCH/HR) =  0.88  AREA-AVERAGED Ap =  0.26
 TOTAL AREA(ACRES) =       34.9        PEAK FLOW RATE(CFS) =      88.96

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
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  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        5.47      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.35      0.75     0.600    56
  COMMERCIAL                 A        0.87      0.98     0.100    32
  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.

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  FLOW PROCESS FROM NODE  11227.00 TO NODE  11228.00 IS CODE =  63
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----------------------------------------------------------------------------
  >>>>>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) =     106.73
    ***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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.59      0.75     0.600    56
  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
```

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  AREA-AVERAGED Fm(INCH/HR) =  0.20
  AREA-AVERAGED Fp(INCH/HR) =  0.86
  AREA-AVERAGED Ap =  0.23
  EFFECTIVE 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
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      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
      2      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       Q      Tc   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
      2      355.67   26.56    2.036  0.80( 0.18) 0.23     205.3   11210.00
      3      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) = 39.00

  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) =     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
```



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  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    56
  COMMERCIAL                 B       62.16      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.96      0.75     0.600    56
  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 =  0.20
  TOTAL 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) =     355.67
  PIPEFLOW 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) =  1.16
    HALFSTREET 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
      2      437.95   28.69    1.945  0.79( 0.16) 0.20     272.8   11210.00
```

```
     3      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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        8.11      0.75     0.500    56
  COMMERCIAL                 B       80.91      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.30      0.75     0.600    56
  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
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  *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 Tc :
  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
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      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
      3      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
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      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
      3      525.74   36.70    1.677  0.78( 0.15) 0.19     381.6   11200.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
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                          Analysis prepared by:

                              RBF Consulting
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                                   92618

 ************************* DESCRIPTION OF STUDY *************************
* 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
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
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 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  11302.00 TO NODE  11303.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   862.73
  ELEVATION DATA: UPSTREAM(FEET) =   1207.00  DOWNSTREAM(FEET) =   1205.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   15.282
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.840
  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        6.38      0.75      0.100    56   15.28
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.60      0.75      0.600    56   20.71
  COMMERCIAL                 A        1.25      0.98      0.100    32   15.28
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        0.58      0.98      0.600    32   20.71
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.80
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.211
  SUBAREA RUNOFF(CFS) =     23.58
  TOTAL AREA(ACRES) =      9.81   PEAK FLOW RATE(CFS) =     23.58

  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  11303.00 TO NODE  11304.00 IS CODE =  63
------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
========================================================================
  UPSTREAM ELEVATION(FEET) = 1205.00  DOWNSTREAM ELEVATION(FEET) = 1202.00
```

```
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      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
COMMERCIAL                 B       16.73      0.75     0.100    56
RESIDENTIAL
"3-4 DWELLINGS/ACRE"       B        0.71      0.75     0.600    56
COMMERCIAL                 A        1.91      0.98     0.100    32
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
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  STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
  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      Fp         Ap     SCS
       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    56
  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
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  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.

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  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
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    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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       47.35      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.67      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) =   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.

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  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)<<<<<
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==========================================================================
  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                 B        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
```



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  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 Tc :
  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 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        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

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  FLOW PROCESS FROM NODE  11311.00 TO NODE  11312.00 IS CODE =  92
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
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==============================================================================
  UPSTREAM NODE ELEVATION(FEET) =   1212.00
  DOWNSTREAM NODE ELEVATION(FEET) =   1211.50
  CHANNEL LENGTH THRU SUBAREA(FEET) =   581.61
  "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) =  1.953
  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        0.82      0.75     0.600    56
  COMMERCIAL                 B        4.89      0.75     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.172
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     14.86
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.19
  AVERAGE FLOW DEPTH(FEET) =   0.77   FLOOD WIDTH(FEET) =   52.81
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   8.15   Tc(MIN.) =   28.52
  SUBAREA AREA(ACRES) =    5.71       SUBAREA RUNOFF(CFS) =    9.38
  EFFECTIVE AREA(ACRES) =   10.62     AREA-AVERAGED Fm(INCH/HR) =   0.11
  AREA-AVERAGED Fp(INCH/HR) =   0.75  AREA-AVERAGED Ap =   0.15
  TOTAL AREA(ACRES) =       10.6         PEAK FLOW RATE(CFS) =      17.60

  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 "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.81   FLOOD WIDTH(FEET) =   56.69
  FLOW VELOCITY(FEET/SEC.) =   1.23   DEPTH*VELOCITY(FT*FT/SEC) =   0.99
  LONGEST FLOWPATH FROM NODE  11310.00 TO NODE  11312.00 =    1459.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11312.00 TO NODE  11313.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
==============================================================================
  UPSTREAM ELEVATION(FEET) = 1211.50  DOWNSTREAM ELEVATION(FEET) = 1210.00
  STREET LENGTH(FEET) =   302.50   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) =      28.54
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.65
    HALFSTREET FLOOD WIDTH(FEET) =   24.62
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    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.28
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.49
  STREET FLOW TRAVEL TIME(MIN.) =   2.21   Tc(MIN.) =   30.73
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.867
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       13.21      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.43      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.116
  SUBAREA AREA(ACRES) =   13.64      SUBAREA RUNOFF(CFS) =   21.86
  EFFECTIVE AREA(ACRES) =     24.26    AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.13
  TOTAL AREA(ACRES) =       24.3        PEAK FLOW RATE(CFS) =      38.65

  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) = 0.71   HALFSTREET FLOOD WIDTH(FEET) =  29.91
  FLOW VELOCITY(FEET/SEC.) =  2.45   DEPTH*VELOCITY(FT*FT/SEC.) =   1.74
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         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.

****************************************************************************
  FLOW PROCESS FROM NODE  11313.00 TO NODE  11314.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
==============================================================================
  UPSTREAM ELEVATION(FEET) = 1210.00  DOWNSTREAM ELEVATION(FEET) = 1200.00
  STREET LENGTH(FEET) =   564.52   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) =      60.33
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.67
    HALFSTREET FLOOD WIDTH(FEET) =   26.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.44
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.98
  STREET FLOW TRAVEL TIME(MIN.) =   2.12   Tc(MIN.) =   32.85
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.794
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
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     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL               B       27.36      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"     B        0.83      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.115
  SUBAREA AREA(ACRES) =   28.19      SUBAREA RUNOFF(CFS) =   43.34
  EFFECTIVE AREA(ACRES) =     52.45    AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.12
  TOTAL AREA(ACRES) =       52.5        PEAK FLOW RATE(CFS) =      80.39

  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) = 0.73   HALFSTREET FLOOD WIDTH(FEET) =  31.94
  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,
         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.

****************************************************************************
  FLOW PROCESS FROM NODE  11314.00 TO NODE  11315.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1200.00  DOWNSTREAM ELEVATION(FEET) = 1185.00
  STREET LENGTH(FEET) =   751.01   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) =     110.18
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.79
    HALFSTREET FLOOD WIDTH(FEET) =   37.56
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.26
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.14
  STREET FLOW TRAVEL TIME(MIN.) =   2.38   Tc(MIN.) =   35.23
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.720
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  SCHOOL                   B        8.18      0.75     0.600    56
  COMMERCIAL               B       33.04      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"     B        1.12      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
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  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.210
  SUBAREA AREA(ACRES) =   42.34      SUBAREA RUNOFF(CFS) =   59.58
  EFFECTIVE AREA(ACRES) =     94.79    AREA-AVERAGED Fm(INCH/HR) =  0.12
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.16
  TOTAL AREA(ACRES) =       94.8        PEAK FLOW RATE(CFS) =     136.49

  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 STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.83   HALFSTREET FLOOD WIDTH(FEET) =  40.26
  FLOW VELOCITY(FEET/SEC.) =  5.60   DEPTH*VELOCITY(FT*FT/SEC.) =   4.66
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  751.0 FT WITH ELEVATION-DROP =  15.0 FT, IS  138.9 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE  11315.00
  LONGEST FLOWPATH FROM NODE  11310.00 TO NODE  11315.00 =    3077.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11315.00 TO NODE  11316.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
============================================================================
  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

  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) =   0.87

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     141.28
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.88
    HALFSTREET FLOOD WIDTH(FEET) =   42.88
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.92
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.35
  STREET FLOW TRAVEL TIME(MIN.) =   2.55   Tc(MIN.) =   37.79
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.650
  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        1.03      0.75     0.600    56
  COMMERCIAL               B        5.97      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) =    7.00      SUBAREA RUNOFF(CFS) =    9.58
  EFFECTIVE AREA(ACRES) =    101.79    AREA-AVERAGED Fm(INCH/HR) =  0.12
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.16
  TOTAL AREA(ACRES) =      101.8        PEAK FLOW RATE(CFS) =     140.03
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 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) =  42.76
 FLOW VELOCITY(FEET/SEC.) =  4.91   DEPTH*VELOCITY(FT*FT/SEC.) =   4.33

 *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) =  24.00    NUMBER OF PIPES =   1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) =  19.91
 PIPE-FLOW(CFS) =      62.59
 PIPEFLOW TRAVEL TIME(MIN.) =   0.63    Tc(MIN.) =  35.86
 * 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

 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) =   82.25
   ***STREET FLOW SPLITS OVER STREET-CROWN***
   FULL DEPTH(FEET) =    0.80   FLOOD WIDTH(FEET) =   38.58
   FULL HALF-STREET VELOCITY(FEET/SEC.) =    4.32
   SPLIT DEPTH(FEET) =    0.73   SPLIT FLOOD WIDTH(FEET) =   32.25
   SPLIT FLOW(CFS) =   35.37   SPLIT VELOCITY(FEET/SEC.) =    4.10
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.80
   HALFSTREET FLOOD WIDTH(FEET) =   38.58
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.32
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.45
 LONGEST FLOWPATH FROM NODE  11310.00 TO NODE  11316.00 =    3830.71 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11316.00 TO NODE  11316.00 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.) =   35.86
 RAINFALL INTENSITY(INCH/HR) =   1.70
 AREA-AVERAGED Fm(INCH/HR) =  0.12
 AREA-AVERAGED Fp(INCH/HR) =  0.75
 AREA-AVERAGED Ap =  0.16
 EFFECTIVE STREAM AREA(ACRES) =     101.79
 TOTAL STREAM AREA(ACRES) =     101.79
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     144.84

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1      281.99   19.20    2.476  0.76( 0.10) 0.14     129.8   11302.00
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     2      144.84   35.86    1.702  0.75( 0.12) 0.16     101.8   11310.00

 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      397.50   19.20    2.476  0.75( 0.11) 0.14     184.3   11302.00
     2      334.86   35.86    1.702  0.75( 0.11) 0.15     231.6   11310.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     397.50    Tc(MIN.) =    19.20
 EFFECTIVE AREA(ACRES) =     184.31   AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.14
 TOTAL AREA(ACRES) =      231.6
 LONGEST FLOWPATH FROM NODE  11302.00 TO NODE  11316.00 =    4592.30 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11316.00 TO NODE  11317.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1175.00  DOWNSTREAM ELEVATION(FEET) = 1160.00
 STREET LENGTH(FEET) =  1841.80   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 =  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) =   0.87

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     425.96
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  1.32
   HALFSTREET FLOOD WIDTH(FEET) =   64.73
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.62
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    7.43
 STREET FLOW TRAVEL TIME(MIN.) =   5.46   Tc(MIN.) =   24.66
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.131
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 SCHOOL                     B        9.92      0.75     0.600    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        1.74      0.75     0.600    56
 COMMERCIAL                 B       21.20      0.75     0.100    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.277
 SUBAREA AREA(ACRES) =   32.86      SUBAREA RUNOFF(CFS) =   56.89
 EFFECTIVE AREA(ACRES) =    217.17    AREA-AVERAGED Fm(INCH/HR) =  0.12
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 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
     1      442.82   20.39    2.389  0.75( 0.12) 0.16     217.2   11302.00
     2      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 **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  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
     2      369.00   36.91    1.673  0.75( 0.12) 0.16     264.5   11310.00
============================================================================
```



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============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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                          Analysis prepared by:

                              RBF Consulting
                            14257 Alton Parkway
                                 Irvine, CA
                                   92618

 ************************* DESCRIPTION OF STUDY *************************
* 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
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
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 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  11400.00 TO NODE  11401.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   884.64
  ELEVATION DATA: UPSTREAM(FEET) =   1210.00  DOWNSTREAM(FEET) =   1208.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   15.514
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.814
  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
  "3-4 DWELLINGS/ACRE"       B        0.99      0.75      0.600    56   21.03
  COMMERCIAL                 B        5.80      0.75      0.100    56   15.51
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.173
  SUBAREA RUNOFF(CFS) =     16.41
  TOTAL AREA(ACRES) =      6.79   PEAK FLOW RATE(CFS) =     16.41

  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  11401.00 TO NODE  11402.00 IS CODE =  63
------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
========================================================================
  UPSTREAM ELEVATION(FEET) = 1208.00  DOWNSTREAM ELEVATION(FEET) = 1206.00
  STREET LENGTH(FEET) =   156.50   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00
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 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  10.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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
 COMMERCIAL                 B        4.86      0.75     0.100    56
 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
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 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B       11.37      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 =  0.123
 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
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  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      76.40
  ***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      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
COMMERCIAL                 B       22.97      0.75     0.100    56
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 Tc :
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.

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 FLOW PROCESS FROM NODE  11404.00 TO NODE  11405.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>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) =     141.67
    ***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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       37.11      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.28      0.75     0.600    56
  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
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  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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     231.93
    ***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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       48.37      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
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  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.14
  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 Tc :
  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
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  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     288.99
  ***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      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
RESIDENTIAL
"3-4 DWELLINGS/ACRE"       B        1.56      0.75     0.600    56
COMMERCIAL                 B        5.41      0.75     0.100    56
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
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----------------------------------------------------------------------------
  >>>>>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 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
  "3-4 DWELLINGS/ACRE"       B        1.04      0.75     0.600    56   21.61
  COMMERCIAL                 B        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) =      9.49

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.39

****************************************************************************
  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
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  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) =   0.87

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.72
    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        2.68      0.75     0.100    56
  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) =      23.24
    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
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  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.470
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        6.67      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.48      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) =    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       12.79      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.03      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.137
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  SUBAREA AREA(ACRES) =   13.82      SUBAREA RUNOFF(CFS) =   26.35
  EFFECTIVE AREA(ACRES) =     27.81    AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.15
  TOTAL AREA(ACRES) =       27.8        PEAK FLOW RATE(CFS) =      52.84

  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:
  DEPTH(FEET) = 0.68   HALFSTREET FLOOD WIDTH(FEET) =  26.87
  FLOW VELOCITY(FEET/SEC.) =  3.76   DEPTH*VELOCITY(FT*FT/SEC.) =   2.56
  LONGEST FLOWPATH FROM NODE  11410.00 TO NODE  11414.00 =    2120.58 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11414.00 TO NODE  11415.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 14 USED)<<<<<
============================================================================
  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

  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) =      77.86
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.78
    HALFSTREET FLOOD WIDTH(FEET) =   36.72
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.83
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.99
  STREET FLOW TRAVEL TIME(MIN.) =   6.06   Tc(MIN.) =   29.07
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.931
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       27.49      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        3.05      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.150
  SUBAREA AREA(ACRES) =   30.54      SUBAREA RUNOFF(CFS) =   49.98
  EFFECTIVE AREA(ACRES) =     58.35    AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.15
  TOTAL AREA(ACRES) =       58.3        PEAK FLOW RATE(CFS) =      95.54

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.29; 6HR = 1.67; 24HR = 3.25

  END OF SUBAREA STREET FLOW HYDRAULICS:
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  DEPTH(FEET) = 0.83   HALFSTREET FLOOD WIDTH(FEET) =  41.56
  FLOW VELOCITY(FEET/SEC.) =  3.96   DEPTH*VELOCITY(FT*FT/SEC.) =   3.28
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         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.

****************************************************************************
  FLOW PROCESS FROM NODE  11415.00 TO NODE  11416.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 14 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1175.00  DOWNSTREAM ELEVATION(FEET) = 1140.00
  STREET LENGTH(FEET) =  2260.01   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) =     154.32
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.90
    HALFSTREET FLOOD WIDTH(FEET) =   48.91
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.02
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.52
  STREET FLOW TRAVEL TIME(MIN.) =   7.51   Tc(MIN.) =   36.58
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.682
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       77.34      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.97      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.130
  SUBAREA AREA(ACRES) =   82.31      SUBAREA RUNOFF(CFS) =  117.39
  EFFECTIVE AREA(ACRES) =    140.66    AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.14
  TOTAL AREA(ACRES) =      140.7        PEAK FLOW RATE(CFS) =     199.88

  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) = 0.97   HALFSTREET FLOOD WIDTH(FEET) =  53.95
  FLOW VELOCITY(FEET/SEC.) =  5.34   DEPTH*VELOCITY(FT*FT/SEC.) =   5.16

  *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:
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 ** 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.

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 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
     1      283.75   23.39    2.200  0.75( 0.11) 0.14     148.4   11400.00
     2      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 **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  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
     2      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
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 EFFECTIVE AREA(ACRES) =     255.59   AREA-AVERAGED Fm(INCH/HR) =  0.11
 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      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                  B        3.95      0.75      0.100    56
 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:
```

```
  ** 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 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.)
```



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  COMMERCIAL                  B        8.59      0.75     0.100    56   10.06
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        B        0.65      0.75     0.600    56   13.63
  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) =     29.52

  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B        7.12      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        B        0.54      0.75     0.600    56
  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        PEAK FLOW RATE(CFS) =      53.25
  V-GUTTER HYDRAULICS BASED ON MAINLINE Tc :
  V-GUTTER HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =   23.73

  END OF SUBAREA "V" GUTTER HYDRAULICS:
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  DEPTH(FEET) =  0.84   FLOOD WIDTH(FEET) =    8.82
  FLOW VELOCITY(FEET/SEC.) =   6.60   DEPTH*VELOCITY(FT*FT/SEC) =   5.57
  LONGEST FLOWPATH FROM NODE  11420.00 TO NODE  11422.00 =     989.39 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11422.00 TO NODE  11423.00 IS CODE =  92
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =   1162.00
  DOWNSTREAM NODE ELEVATION(FEET) =   1160.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   285.52
  "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) =  3.306
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        7.62      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 =  0.134
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     65.05
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.72
  AVERAGE FLOW DEPTH(FEET) =   0.86   FLOOD WIDTH(FEET) =   62.97
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.28   Tc(MIN.) =   11.86
  SUBAREA AREA(ACRES) =    8.18       SUBAREA RUNOFF(CFS) =   23.60
  EFFECTIVE AREA(ACRES) =   25.08     AREA-AVERAGED Fm(INCH/HR) =   0.10
  AREA-AVERAGED Fp(INCH/HR) =   0.57  AREA-AVERAGED Ap =   0.18
  TOTAL AREA(ACRES) =       25.1         PEAK FLOW RATE(CFS) =      72.35

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

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.88   FLOOD WIDTH(FEET) =   65.80
  FLOW VELOCITY(FEET/SEC.) =   3.80   DEPTH*VELOCITY(FT*FT/SEC) =   3.36
  LONGEST FLOWPATH FROM NODE  11420.00 TO NODE  11423.00 =    1274.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11423.00 TO NODE  11424.00 IS CODE =  92
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =   1160.00
  DOWNSTREAM NODE ELEVATION(FEET) =   1155.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   438.00
  "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) =  3.077
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
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  COMMERCIAL                 B       11.92      0.75     0.100    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 =  0.135
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     89.49
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.83
  AVERAGE FLOW DEPTH(FEET) =   0.88   FLOOD WIDTH(FEET) =   64.91
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.51   Tc(MIN.) =   13.37
  SUBAREA AREA(ACRES) =   12.81       SUBAREA RUNOFF(CFS) =   34.31
  EFFECTIVE AREA(ACRES) =   37.89     AREA-AVERAGED Fm(INCH/HR) =   0.10
  AREA-AVERAGED Fp(INCH/HR) =   0.62  AREA-AVERAGED Ap =   0.16
  TOTAL AREA(ACRES) =       37.9         PEAK FLOW RATE(CFS) =     101.47

  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 "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.91   FLOOD WIDTH(FEET) =   68.34
  FLOW VELOCITY(FEET/SEC.) =   4.95   DEPTH*VELOCITY(FT*FT/SEC) =   4.48
  LONGEST FLOWPATH FROM NODE  11420.00 TO NODE  11424.00 =    1712.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11424.00 TO NODE  11425.00 IS CODE =  92
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =   1155.00
  DOWNSTREAM NODE ELEVATION(FEET) =   1150.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   584.00
  "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) =  2.818
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       15.83      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.17      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.134
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    122.25
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.63
  AVERAGE FLOW DEPTH(FEET) =   0.99   FLOOD WIDTH(FEET) =   77.90
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   2.10   Tc(MIN.) =   15.48
  SUBAREA AREA(ACRES) =   17.00       SUBAREA RUNOFF(CFS) =   41.58
  EFFECTIVE AREA(ACRES) =   54.89     AREA-AVERAGED Fm(INCH/HR) =   0.10
  AREA-AVERAGED Fp(INCH/HR) =   0.66  AREA-AVERAGED Ap =   0.15
  TOTAL AREA(ACRES) =       54.9         PEAK FLOW RATE(CFS) =     134.25

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
  ** 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.) =  15.96
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  PIPE-FLOW(CFS) =      50.20
  PIPEFLOW TRAVEL TIME(MIN.) =   0.61    Tc(MIN.) =  13.98
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.995
  SUBAREA AREA(ACRES) =   17.00      SUBAREA RUNOFF(CFS) =   44.29
  EFFECTIVE AREA(ACRES) =   54.89    AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.52  AREA-AVERAGED Ap =  0.20
  TOTAL AREA(ACRES) =       54.9        PEAK FLOW RATE(CFS) =     143.00
  V-GUTTER HYDRAULICS BASED ON MAINLINE Tc :
  V-GUTTER HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =   92.80

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.92   FLOOD WIDTH(FEET) =   69.84
  FLOW VELOCITY(FEET/SEC.) =   4.34   DEPTH*VELOCITY(FT*FT/SEC) =   3.99
  LONGEST FLOWPATH FROM NODE  11420.00 TO NODE  11425.00 =    2296.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11425.00 TO NODE  11426.00 IS CODE =  92
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =   1150.00
  DOWNSTREAM NODE ELEVATION(FEET) =   1139.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   770.03
  "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) =  2.608
  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        1.58      0.75     0.600    56
  COMMERCIAL                 B       15.68      0.75     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  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
  AVERAGE FLOW DEPTH(FEET) =   0.99   FLOOD WIDTH(FEET) =   78.80
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   2.14   Tc(MIN.) =   17.61
  SUBAREA AREA(ACRES) =   17.26       SUBAREA RUNOFF(CFS) =   38.82
  EFFECTIVE AREA(ACRES) =   72.15     AREA-AVERAGED Fm(INCH/HR) =   0.10
  AREA-AVERAGED Fp(INCH/HR) =   0.56  AREA-AVERAGED Ap =   0.18
  TOTAL AREA(ACRES) =       72.2         PEAK FLOW RATE(CFS) =     162.68

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.92; 6HR = 2.53; 24HR = 5.50

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.99   FLOOD WIDTH(FEET) =   78.80
  FLOW VELOCITY(FEET/SEC.) =   6.02   DEPTH*VELOCITY(FT*FT/SEC) =   5.98
  LONGEST FLOWPATH FROM NODE  11420.00 TO NODE  11426.00 =    3066.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11426.00 TO NODE  11426.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
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============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   17.61
  RAINFALL INTENSITY(INCH/HR) =   2.61
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.56
  AREA-AVERAGED Ap =  0.18
  EFFECTIVE STREAM AREA(ACRES) =      72.15
  TOTAL STREAM AREA(ACRES) =      72.15
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     162.68

  ** CONFLUENCE DATA **
   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
      1      462.38   32.77    1.797  0.75( 0.11) 0.14     294.6   11410.00
      2      162.68   17.61    2.608  0.56( 0.10) 0.18      72.2   11420.00

  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      586.80   17.61    2.608  0.68( 0.11) 0.15     253.1   11420.00
      2      615.22   25.42    2.093  0.70( 0.11) 0.15     333.3   11400.00
      3      572.38   32.77    1.797  0.70( 0.11) 0.15     366.8   11410.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     615.22    Tc(MIN.) =    25.42
  EFFECTIVE AREA(ACRES) =     333.30   AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.70  AREA-AVERAGED Ap =  0.15
  TOTAL AREA(ACRES) =      366.8
  LONGEST FLOWPATH FROM NODE  11400.00 TO NODE  11426.00 =    8580.97 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11426.00 TO NODE  11436.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 14 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1139.00  DOWNSTREAM ELEVATION(FEET) = 1138.00
  STREET LENGTH(FEET) =  1323.13   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) =     619.04
    ***STREET FLOWING FULL***
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    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      Fp         Ap     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<<<<<
```



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============================================================================
  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 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
  "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                 B        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) =     22.72

  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
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 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) =   0.87

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      33.47
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.65
   HALFSTREET FLOOD WIDTH(FEET) =   24.62
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.68
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.74
 STREET FLOW TRAVEL TIME(MIN.) =   1.82   Tc(MIN.) =   15.58
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.807
 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"                 B        5.90      0.63     1.000    65
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        0.50      0.75     0.600    56
 COMMERCIAL                 B        3.60      0.75     0.100    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.64
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.656
 SUBAREA AREA(ACRES) =   10.00      SUBAREA RUNOFF(CFS) =   21.47
 EFFECTIVE AREA(ACRES) =     19.63    AREA-AVERAGED Fm(INCH/HR) =  0.41
 AREA-AVERAGED Fp(INCH/HR) =  0.64  AREA-AVERAGED Ap =  0.64
 TOTAL AREA(ACRES) =       19.6        PEAK FLOW RATE(CFS) =      42.31

 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) = 0.70   HALFSTREET FLOOD WIDTH(FEET) =  28.34
 FLOW VELOCITY(FEET/SEC.) =  2.84   DEPTH*VELOCITY(FT*FT/SEC.) =   1.98
 LONGEST FLOWPATH FROM NODE  11430.00 TO NODE  11432.00 =    1205.13 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  11432.00 TO NODE  11433.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1166.00  DOWNSTREAM ELEVATION(FEET) = 1163.00
 STREET LENGTH(FEET) =   282.00   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) =      51.93
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.69
   HALFSTREET FLOOD WIDTH(FEET) =   28.03
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.53
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   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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 B        5.29      0.63     1.000    65
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        0.45      0.75     0.600    56
 COMMERCIAL                 B        3.68      0.75     0.100    56
 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 = 5.50

 END 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) = 32.00

 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) =      74.40
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.72
   HALFSTREET 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 AGRICULTURAL FAIR COVER
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  "ORCHARDS"                 B        9.40      0.63     1.000    65
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.77      0.75     0.600    56
  COMMERCIAL                 B        5.89      0.75     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.64
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.651
  SUBAREA AREA(ACRES) =   16.06      SUBAREA RUNOFF(CFS) =   30.47
  EFFECTIVE AREA(ACRES) =     45.11    AREA-AVERAGED Fm(INCH/HR) =  0.41
  AREA-AVERAGED Fp(INCH/HR) =  0.64  AREA-AVERAGED Ap =  0.64
  TOTAL AREA(ACRES) =       45.1        PEAK FLOW RATE(CFS) =      85.80

  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) = 0.75   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  11434.00 TO NODE  11435.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1155.00  DOWNSTREAM ELEVATION(FEET) = 1150.00
  STREET LENGTH(FEET) =   597.51   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) =     103.00
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.86
    HALFSTREET FLOOD WIDTH(FEET) =   41.90
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.80
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.29
  STREET FLOW TRAVEL TIME(MIN.) =   2.62   Tc(MIN.) =   21.20
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.334
  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"                 B       11.52      0.63     1.000    65
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.97      0.75     0.600    56
  COMMERCIAL                 B        7.42      0.75     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.64
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.645
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  SUBAREA AREA(ACRES) =   19.91      SUBAREA RUNOFF(CFS) =   34.39
  EFFECTIVE AREA(ACRES) =     65.02    AREA-AVERAGED Fm(INCH/HR) =  0.41
  AREA-AVERAGED Fp(INCH/HR) =  0.64  AREA-AVERAGED Ap =  0.64
  TOTAL AREA(ACRES) =       65.0        PEAK FLOW RATE(CFS) =     112.39

  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) = 0.88   HALFSTREET FLOOD WIDTH(FEET) =  42.88
  FLOW VELOCITY(FEET/SEC.) =  3.91   DEPTH*VELOCITY(FT*FT/SEC.) =   3.46
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         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
  LONGEST FLOWPATH FROM NODE  11430.00 TO NODE  11435.00 =    2545.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11435.00 TO NODE  11436.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1150.00  DOWNSTREAM ELEVATION(FEET) = 1138.00
  STREET LENGTH(FEET) =   744.00   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) =   1.01

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     130.45
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.85
    HALFSTREET FLOOD WIDTH(FEET) =   40.93
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.12
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.33
  STREET FLOW TRAVEL TIME(MIN.) =   2.42   Tc(MIN.) =   23.62
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.187
  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"                 B       13.26      0.63     1.000    65
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.17      0.75     0.600    56
  COMMERCIAL                 B        7.43      0.75     0.100    56
  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
  EFFECTIVE AREA(ACRES) =     87.88    AREA-AVERAGED Fm(INCH/HR) =  0.42
  AREA-AVERAGED Fp(INCH/HR) =  0.64  AREA-AVERAGED Ap =  0.65
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  TOTAL AREA(ACRES) =       87.9        PEAK FLOW RATE(CFS) =     139.92

  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) =  41.66
  FLOW VELOCITY(FEET/SEC.) =  5.25   DEPTH*VELOCITY(FT*FT/SEC.) =   4.51
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  744.0 FT WITH ELEVATION-DROP =  12.0 FT, IS   67.5 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE  11436.00
  LONGEST FLOWPATH FROM NODE  11430.00 TO NODE  11436.00 =    3289.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11436.00 TO NODE  11436.00 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.) =   23.62
  RAINFALL INTENSITY(INCH/HR) =   2.19
  AREA-AVERAGED Fm(INCH/HR) =  0.42
  AREA-AVERAGED Fp(INCH/HR) =  0.64
  AREA-AVERAGED Ap =  0.65
  EFFECTIVE STREAM AREA(ACRES) =      87.88
  TOTAL STREAM AREA(ACRES) =      87.88
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     139.92

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      586.80   19.50    2.454  0.69( 0.11) 0.16     258.5   11420.00
      1      615.22   27.30    2.005  0.70( 0.11) 0.15     338.7   11400.00
      1      572.38   34.70    1.736  0.70( 0.11) 0.15     372.2   11410.00
      2      139.92   23.62    2.187  0.64( 0.42) 0.65      87.9   11430.00

  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      719.72   19.50    2.454  0.66( 0.18) 0.26     331.1   11420.00
      2      741.72   23.62    2.187  0.67( 0.18) 0.27     388.8   11430.00
      3      740.73   27.30    2.005  0.67( 0.17) 0.26     426.6   11400.00
      4      676.64   34.70    1.736  0.67( 0.17) 0.25     460.1   11410.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     741.72    Tc(MIN.) =    23.62
  EFFECTIVE AREA(ACRES) =     388.76   AREA-AVERAGED Fm(INCH/HR) =  0.18
  AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap =  0.27
  TOTAL AREA(ACRES) =      460.1
  LONGEST FLOWPATH FROM NODE  11400.00 TO NODE  11436.00 =    9904.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11436.00 TO NODE  11437.00 IS CODE =  63
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----------------------------------------------------------------------------
  >>>>>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) =     776.43
    ***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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  SCHOOL                     B        2.47      0.75     0.600    56
  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"                 B       33.73      0.63     1.000    65
  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
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  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
      2      764.99   24.31    2.150  0.66( 0.21) 0.32     438.6   11430.00
      3      759.75   27.99    1.975  0.66( 0.20) 0.31     476.4   11400.00
      4      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  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
  PEAK FLOW RATE(CFS)   =     764.99

  ** 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
      2      764.99   24.31    2.150  0.66( 0.21) 0.32     438.6   11430.00
      3      759.75   27.99    1.975  0.66( 0.20) 0.31     476.4   11400.00
      4      697.20   35.39    1.716  0.67( 0.20) 0.30     509.9   11410.00
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
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                          Analysis prepared by:

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                                 Irvine, CA
                                   92618

 ************************** DESCRIPTION OF STUDY *************************
* 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)    (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
```



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 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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.486
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.061
  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
  "3-4 DWELLINGS/ACRE"       B        0.43      0.75      0.600    56   18.28
  COMMERCIAL                 B        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) =     11.79
  TOTAL AREA(ACRES) =      4.44   PEAK FLOW RATE(CFS) =     11.79

  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 = .0150
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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        3.90      0.75     0.100    56
  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) =      19.44

  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) =      36.98
    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      Fp         Ap     SCS
```



```
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       17.51      0.75     0.100    56
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       33.83      0.75     0.100    56
  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
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       33.83      0.75     0.100    56
  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
  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<<<<<
```



```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  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      Fp         Ap     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    56
  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
```

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   15.475
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.818
  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        8.34      0.75     0.100    56   15.48
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.08      0.75     0.600    56   20.97
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.157
  SUBAREA RUNOFF(CFS) =     22.90
  TOTAL AREA(ACRES) =      9.42   PEAK FLOW RATE(CFS) =     22.90

  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  11505.20 TO NODE  11505.30 IS CODE =  92
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =   1117.00
  DOWNSTREAM NODE ELEVATION(FEET) =   1115.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   771.72
  "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
  MAXIMUM DEPTH(FEET) =   1.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.332
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       14.19      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.74      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.125
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     37.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.24
  AVERAGE FLOW DEPTH(FEET) =   0.85   FLOOD WIDTH(FEET) =   61.92
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   5.75   Tc(MIN.) =   21.22
  SUBAREA AREA(ACRES) =   14.93       SUBAREA RUNOFF(CFS) =   30.08
  EFFECTIVE AREA(ACRES) =   24.35     AREA-AVERAGED Fm(INCH/HR) =   0.10
  AREA-AVERAGED Fp(INCH/HR) =   0.75  AREA-AVERAGED Ap =   0.14
  TOTAL AREA(ACRES) =       24.3         PEAK FLOW RATE(CFS) =      48.85

  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) =  0.91   FLOOD WIDTH(FEET) =   68.64
  FLOW VELOCITY(FEET/SEC.) =   2.36   DEPTH*VELOCITY(FT*FT/SEC) =   2.15
  LONGEST FLOWPATH FROM NODE  11505.10 TO NODE  11505.30 =    1780.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11505.30 TO NODE  11506.00 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) =  1102.00
  FLOW LENGTH(FEET) =  1260.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  26.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.51
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      48.85
  PIPE TRAVEL TIME(MIN.) =   2.21    Tc(MIN.) =   23.43
  LONGEST FLOWPATH FROM NODE  11505.10 TO NODE  11506.00 =    3040.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  11506.00 TO NODE  11506.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   23.43
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.197
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       24.06      0.75     0.100    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 =  0.119
  SUBAREA AREA(ACRES) =   25.00      SUBAREA RUNOFF(CFS) =   47.44
  EFFECTIVE AREA(ACRES) =     49.35   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.13
  TOTAL AREA(ACRES) =       49.3       PEAK FLOW RATE(CFS) =      93.35

  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<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   23.43
  RAINFALL INTENSITY(INCH/HR) =   2.20
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.13
  EFFECTIVE STREAM AREA(ACRES) =      49.35
  TOTAL STREAM AREA(ACRES) =      49.35
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      93.35

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   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
      2       93.35   23.43    2.197  0.75( 0.10) 0.13      49.3   11505.10
```

```
  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      353.05   23.43    2.197  0.75( 0.10) 0.14     187.2   11505.10
      2      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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        7.60      0.75     0.100    56
  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 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
  "3-4 DWELLINGS/ACRE"       B        0.41      0.75     0.600    56   20.67
  COMMERCIAL                 B        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) =      5.59

  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        9.23      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.20      0.75     0.600    56
  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
```

```
  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):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B       19.46      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        B        0.50      0.75     0.600    56
  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      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B       62.69      0.75     0.100    56
  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      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B       92.51      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        B        5.00      0.75     0.600    56
  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
```

```
****************************************************************************
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       35.05      0.75     0.100    56
  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 AREA(ACRES) =   37.02      SUBAREA RUNOFF(CFS) =   61.61
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       24.85      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.36      0.75     0.600    56
  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

****************************************************************************
```

```
 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 =    8752.45 FEET.

****************************************************************************
 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B       59.13      0.75     0.100    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        1.40      0.75     0.600    56
 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
```



```
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.835
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B       26.47      0.75     0.100    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        3.90      0.75     0.600    56
 NATURAL FAIR COVER
 "OPEN BRUSH"               B       16.77      0.61     1.000    66
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.64
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.462
 SUBAREA AREA(ACRES) =   47.14      SUBAREA RUNOFF(CFS) =   65.22
 EFFECTIVE AREA(ACRES) =    427.34   AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.71  AREA-AVERAGED Ap =  0.16
 TOTAL AREA(ACRES) =      427.3       PEAK FLOW RATE(CFS) =     662.34

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.27; 6HR = 1.65; 24HR = 3.61
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =      427.3  TC(MIN.) =     31.64
 EFFECTIVE AREA(ACRES) =    427.34  AREA-AVERAGED Fm(INCH/HR)=  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.71  AREA-AVERAGED Ap = 0.158
 PEAK FLOW RATE(CFS)   =     662.34
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
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             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                              *
* 100-YR HC ULTIMATE CONDITION    SEPTEMBER 2013   TMULI                 *
 ************************************************************************

  FILE NAME: LR0201ZZ.DAT
  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
     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
```



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 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)
        VALLEY(DEVELOPED)                    1.000
        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  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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.474
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.755
  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        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 DWELLINGS/ACRE"         B        2.55      0.75     0.700    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

************************************************************************
  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
 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) =      22.82
   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):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     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
 "OPEN BRUSH"               B        0.90      0.61     1.000    66
 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) =      30.50

 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
```



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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL FAIR COVER
 "OPEN BRUSH"               A        1.17      0.86     1.000    46
 NATURAL FAIR COVER
 "OPEN BRUSH"               B        2.63      0.61     1.000    66
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        3.01      0.75     0.700    56
 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
```

```
  Manning's FRICTION FACTOR for Streetflow Section(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) =      97.01
    ***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.) =    7.45
    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):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               A        1.82      0.86     1.000    46
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       19.46      0.61     1.000    66
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        6.79      0.75     0.700    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         A        0.01      0.98     0.700    32
  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):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.80

  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
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(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) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
```



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  Manning's FRICTION FACTOR for Streetflow Section(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) =     220.14
    ***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.) =   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
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               A        5.68      0.86     1.000    46
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         A        3.92      0.98     0.700    32
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        6.10      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       39.60      0.61     1.000    66
  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) =     286.98

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.72

  END OF SUBAREA STREET FLOW HYDRAULICS:
  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
  PIPE-FLOW VELOCITY(FEET/SEC.) =  48.16
  PIPE-FLOW(CFS) =     139.84
  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

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.25; 6HR = 3.25; 24HR = 7.72
  *NOTE: STREET-CAPACITY MAY BE EXCEEDED*
  STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =  170.44
    ***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.) =    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               A        2.42      0.86     1.000    46
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         A        7.44      0.98     0.700    32
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       21.25      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B      127.72      0.61     1.000    66
  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) =     699.27
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               A        2.55      0.86     1.000    46
  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"               B       66.90      0.61     1.000    66
  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      Fp         Ap     SCS
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"             A        3.92      0.86     1.000    46
  RESIDENTIAL
  "2 DWELLINGS/ACRE"       A        0.86      0.98     0.700    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"     A       16.85      0.98     0.600    32
  MOBILE HOME PARK         B       25.39      0.75     0.250    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"     B       10.75      0.75     0.600    56
  NATURAL FAIR COVER
  "OPEN BRUSH"             B       87.64      0.61     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.67
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.791
  SUBAREA AREA(ACRES) =  145.41      SUBAREA RUNOFF(CFS) =  310.39
  EFFECTIVE AREA(ACRES) =    495.13   AREA-AVERAGED Fm(INCH/HR) =  0.59
  AREA-AVERAGED Fp(INCH/HR) =  0.66  AREA-AVERAGED Ap =  0.89
  TOTAL AREA(ACRES) =      495.1       PEAK FLOW RATE(CFS) =    1030.46

  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  20108.00 TO NODE  20109.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2095.00  DOWNSTREAM(FEET) =   2020.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2023.91   CHANNEL SLOPE =  0.0371
  CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
  CHANNEL FLOW THRU SUBAREA(CFS) =    1030.46
  FLOW VELOCITY(FEET/SEC.) =  11.95   FLOW DEPTH(FEET) =   1.96
  TRAVEL TIME(MIN.) =   2.82   Tc(MIN.) =   17.56
  LONGEST FLOWPATH FROM NODE  20100.00 TO NODE  20109.00 =    8231.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20109.00 TO NODE  20109.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   17.56
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.613
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"             A        2.81      0.86     1.000    46
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"     A       27.06      0.98     0.600    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"     B       26.94      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"       B       35.77      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"             B      102.40      0.61     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.69
```



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  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.834
  SUBAREA AREA(ACRES) =  194.98      SUBAREA RUNOFF(CFS) =  357.76
  EFFECTIVE AREA(ACRES) =    690.11   AREA-AVERAGED Fm(INCH/HR) =  0.59
  AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap =  0.88
  TOTAL AREA(ACRES) =      690.1       PEAK FLOW RATE(CFS) =    1259.07

  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  20109.00 TO NODE  20109.00 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= 2.25;6H= 3.25;24H= 7.56
  S-GRAPH: VALLEY(DEV.)=100.0%;VALLEY(UNDEV.)/DESERT=  0.0%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.29; LAG(HR) = 0.23; Fm(INCH/HR) = 0.59; 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 = 1.00; 6HR = 1.00; 24HR= 1.00
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =      690.1
  LONGEST FLOWPATH FROM NODE  20100.00 TO NODE  20109.00 =    8231.30 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   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
  UNIT-HYDROGRAPH METHOD PEAK FLOW RATE(CFS) =   1254.71
  TOTAL PEAK FLOW RATE(CFS) =   1254.71 (SOURCE FLOW INCLUDED)
  RATIONAL METHOD PEAK FLOW RATE(CFS) =   1259.07
   (UPSTREAM NODE PEAK FLOW RATE(CFS) =   1259.07)
  PEAK FLOW RATE(CFS) USED =   1259.07

****************************************************************************
  FLOW PROCESS FROM NODE  20109.00 TO NODE  20110.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2020.00  DOWNSTREAM(FEET) =   1960.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1927.24   CHANNEL SLOPE =  0.0311
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   5.00
  CHANNEL FLOW THRU SUBAREA(CFS) =    1259.07
  FLOW VELOCITY(FEET/SEC.) =  27.63   FLOW DEPTH(FEET) =   2.89
  TRAVEL TIME(MIN.) =   1.16   Tc(MIN.) =   18.72
  LONGEST FLOWPATH FROM NODE  20100.00 TO NODE  20110.00 =   10158.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20110.00 TO NODE  20110.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   18.72
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.514
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE            GROUP   (ACRES)   (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"              A        5.83      0.86     1.000    46
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"      A       33.80      0.98     0.600    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"      B       25.19      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"        B        9.84      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"              B       45.99      0.61     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.780
  SUBAREA AREA(ACRES) =  120.65
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.46;30M= 0.95;1H= 1.25;3H= 2.25;6H= 3.25;24H= 7.55
  S-GRAPH: VALLEY(DEV.)=100.0%;VALLEY(UNDEV.)/DESERT=  0.0%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.31; LAG(HR) = 0.25; Fm(INCH/HR) = 0.58; Ybar = 0.51
  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) =      810.8
  LONGEST FLOWPATH FROM NODE  20100.00 TO NODE  20110.00 =   10158.54 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0281; Lca/L=0.4,n=.0251; Lca/L=0.5,n=.0231;Lca/L=0.6,n=.0216
  TIME OF PEAK FLOW(HR) = 16.33  RUNOFF VOLUME(AF) =     262.28
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    1443.23
  TOTAL AREA(ACRES) =      810.8       PEAK FLOW RATE(CFS) =    1443.23

  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  20110.00 TO NODE  20111.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1960.00  DOWNSTREAM(FEET) =   1920.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   928.33   CHANNEL SLOPE =  0.0431
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   5.00
  CHANNEL FLOW THRU SUBAREA(CFS) =    1443.23
  FLOW VELOCITY(FEET/SEC.) =  32.28   FLOW DEPTH(FEET) =   2.85
  TRAVEL TIME(MIN.) =   0.48   Tc(MIN.) =   19.20
  LONGEST FLOWPATH FROM NODE  20100.00 TO NODE  20111.00 =   11086.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20111.00 TO NODE  20111.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   19.20
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.476
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
  NATURAL FAIR COVER
  "OPEN BRUSH"              A       28.59      0.86     1.000    46
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"      A       31.08      0.98     0.600    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"      B       31.56      0.75     0.600    56
  NATURAL FAIR COVER
  "OPEN BRUSH"              B       41.72      0.61     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"        B        5.26      0.75     0.900    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.76
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.815
  SUBAREA AREA(ACRES) =  138.21
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.46;30M= 0.95;1H= 1.25;3H= 2.24;6H= 3.22;24H= 7.55
  S-GRAPH: VALLEY(DEV.)=100.0%;VALLEY(UNDEV.)/DESERT=  0.0%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.32; LAG(HR) = 0.26; Fm(INCH/HR) = 0.59; Ybar = 0.52
  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  20100.00 TO NODE  20111.00 =   11086.87 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0269; Lca/L=0.4,n=.0241; Lca/L=0.5,n=.0222;Lca/L=0.6,n=.0207
  TIME OF PEAK FLOW(HR) = 16.33  RUNOFF VOLUME(AF) =     301.99
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    1653.30
  TOTAL AREA(ACRES) =      949.0       PEAK FLOW RATE(CFS) =    1653.30

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.16; 6HR = 3.06; 24HR = 7.50

****************************************************************************
  FLOW PROCESS FROM NODE  20111.00 TO NODE  20112.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1920.00  DOWNSTREAM(FEET) =   1870.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1664.97   CHANNEL SLOPE =  0.0300
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   5.00
  CHANNEL FLOW THRU SUBAREA(CFS) =    1653.30
  FLOW VELOCITY(FEET/SEC.) =  29.43   FLOW DEPTH(FEET) =   3.36
  TRAVEL TIME(MIN.) =   0.94   Tc(MIN.) =   20.14
  LONGEST FLOWPATH FROM NODE  20100.00 TO NODE  20112.00 =   12751.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20112.00 TO NODE  20112.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   20.14
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.406
  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        8.51      0.98     0.600    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.54      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         A        3.29      0.98     0.900    32
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       75.85      0.75     0.900    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        7.12      0.61     1.000    66
  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= 0.46;30M= 0.95;1H= 1.25;3H= 2.22;6H= 3.18;24H= 7.54
  S-GRAPH: VALLEY(DEV.)=100.0%;VALLEY(UNDEV.)/DESERT=  0.0%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.34; LAG(HR) = 0.27; Fm(INCH/HR) = 0.60; Ybar = 0.53
  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) =     1044.3
  LONGEST FLOWPATH FROM NODE  20100.00 TO NODE  20112.00 =   12751.84 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0252; Lca/L=0.4,n=.0226; Lca/L=0.5,n=.0208;Lca/L=0.6,n=.0194
  TIME OF PEAK FLOW(HR) = 16.33  RUNOFF VOLUME(AF) =     327.56
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    1750.60
  TOTAL AREA(ACRES) =     1044.3       PEAK FLOW RATE(CFS) =    1750.60

  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  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) =    1750.60
  FLOW VELOCITY(FEET/SEC.) =  26.75   FLOW DEPTH(FEET) =   3.74
  TRAVEL TIME(MIN.) =   0.57   Tc(MIN.) =   20.71
  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.) =   20.71
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.367
  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        4.19      0.75     0.600    56
```



```
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        3.83      0.75     0.900    56
  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= 0.46;30M= 0.95;1H= 1.25;3H= 2.22;6H= 3.18;24H= 7.54
  S-GRAPH: VALLEY(DEV.)=100.0%;VALLEY(UNDEV.)/DESERT=  0.0%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.35; LAG(HR) = 0.28; Fm(INCH/HR) = 0.60; Ybar = 0.53
  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) =     1052.3
  LONGEST FLOWPATH FROM NODE  20100.00 TO NODE  20150.00 =   13659.16 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
  TIME OF PEAK FLOW(HR) = 16.33  RUNOFF VOLUME(AF) =     330.18
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    1726.90
  TOTAL AREA(ACRES) =     1052.3       PEAK FLOW RATE(CFS) =    1750.60
  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 =  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
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.464
  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        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

****************************************************************************
  FLOW PROCESS FROM NODE  20121.00 TO NODE  20122.00 IS CODE =  54
```

```
--------------------------------------------------------------------------------
  >>>>>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      Fp         Ap     SCS
       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) =      28.44
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"                B        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) =   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) =      38.87
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"                B       33.25      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) =   33.25      SUBAREA RUNOFF(CFS) =   70.39
  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
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"                B       36.51      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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"                B       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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"                B       45.37      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) =   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
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       27.94      0.61     1.000    66
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        8.51      0.75     0.700    56
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       18.57      0.61     1.000    66
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       10.38      0.75     0.700    56
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       28.04      0.75     0.900    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       51.49      0.61     1.000    66
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       30.71      0.75     0.700    56
  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
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       19.93      0.75     0.900    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 =  0.891
  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 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        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) =     18.87

  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       15.44      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) =   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
```

```
  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) =      51.14
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       61.27      0.61     1.000    66
  RESIDENTIAL
```



```
  ".4 DWELLING/ACRE"         B       11.25      0.75     0.900    56
  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) =  133.40
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       27.90      0.61     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       18.45      0.75     0.900    56
  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
```

```
  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      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"                B        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) =   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      Fp         Ap     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      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"          B       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) =   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 =   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.) =   23.12
  RAINFALL INTENSITY(INCH/HR) =   2.21
  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
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     326.24

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      426.43   32.29    1.813  0.64( 0.61) 0.95     388.8   20120.00
     2      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
     2      669.52   32.29    1.813  0.65( 0.62) 0.95     618.5   20120.00

 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 ".4 DWELLING/ACRE"         B       20.34      0.75     0.900    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        0.62      0.75     0.600    56
 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) =     733.66
 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 ".4 DWELLING/ACRE"         B        8.58      0.75     0.900    56
 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 =  0.897
 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
 TOTAL AREA(ACRES) =      648.2       PEAK FLOW RATE(CFS) =     733.66
 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
```

```
  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.
   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) =     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 <<<<<
============================================================================

****************************************************************************
```



```
  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) =    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
  ".4 DWELLING/ACRE"         B       24.58      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) =   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.
   EQUIVALENT 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
```

```
  AREA-AVERAGED Fm(INCH/HR)=  0.61   Ybar =  0.53
  PEAK FLOW RATE(CFS)   =   1868.80
================================================================================
================================================================================
  END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

```
 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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             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 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:
========================================================================
                    --*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
```



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 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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.936
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.471
  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
  "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 = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.01700
```

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 MAXIMUM DEPTH(FEET) =   1.00
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.961
 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        6.32      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) =     18.81
 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
 SUBAREA AREA(ACRES) =    6.32       SUBAREA RUNOFF(CFS) =   13.51
 EFFECTIVE AREA(ACRES) =   10.96     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) =      23.44

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 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.

****************************************************************************
 FLOW PROCESS FROM NODE  20202.00 TO NODE  20203.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =      34.88
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.49
   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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
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 "3-4 DWELLINGS/ACRE"       A       11.02      0.98     0.600    32
 MOBILE HOME PARK           A        0.23      0.98     0.250    32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.593
 SUBAREA AREA(ACRES) =   11.25      SUBAREA RUNOFF(CFS) =   22.89
 EFFECTIVE AREA(ACRES) =     22.21    AREA-AVERAGED Fm(INCH/HR) =  0.58
 AREA-AVERAGED Fp(INCH/HR) =  0.98  AREA-AVERAGED Ap =  0.60
 TOTAL AREA(ACRES) =       22.2        PEAK FLOW RATE(CFS) =      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) = 0.53   HALFSTREET FLOOD WIDTH(FEET) =  18.37
 FLOW VELOCITY(FEET/SEC.) =  6.33   DEPTH*VELOCITY(FT*FT/SEC.) =   3.33
 LONGEST FLOWPATH FROM NODE  20200.00 TO NODE  20203.00 =    1499.05 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  20203.00 TO NODE  20204.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>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
 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) =      58.61
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.60
   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
 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        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
```

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  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) =      86.00
    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.

****************************************************************************
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  FLOW PROCESS FROM NODE  20205.00 TO NODE  20206.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>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) =     104.12
    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           A        4.58      0.98     0.250    32
  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
```

```
  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      Fp         Ap     SCS
       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) =    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) =     104.93

  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
----------------------------------------------------------------------------
```



```
  >>>>>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
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.106
  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
  "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      Fp         Ap     SCS
       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
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
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  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
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        2.35      0.98     0.600    32
  MOBILE HOME PARK           A        3.23      0.98     0.250    32
  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
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  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        0.63      0.98     0.600    32
  MOBILE HOME PARK           A        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
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------------------------------------------------------------------------------
  >>>>>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.) =   16.92
  RAINFALL INTENSITY(INCH/HR) =   2.67
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.98
  AREA-AVERAGED Ap =  0.51
  EFFECTIVE STREAM AREA(ACRES) =      21.18
  TOTAL STREAM AREA(ACRES) =      21.18
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      41.44

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      104.93   20.43    2.386  0.97( 0.46) 0.47      60.6   20200.00
      2       41.44   16.92    2.672  0.98( 0.50) 0.51      21.2   20210.00

  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      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

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     141.24    Tc(MIN.) =    16.92
  EFFECTIVE AREA(ACRES) =      71.34   AREA-AVERAGED Fm(INCH/HR) =  0.47
  AREA-AVERAGED Fp(INCH/HR) =  0.97  AREA-AVERAGED Ap =  0.48
  TOTAL AREA(ACRES) =       81.8
  LONGEST FLOWPATH FROM NODE  20200.00 TO NODE  20214.00 =    3451.11 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20214.00 TO NODE  20215.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
==============================================================================
  UPSTREAM ELEVATION(FEET) = 1840.00  DOWNSTREAM ELEVATION(FEET) = 1793.00
  STREET LENGTH(FEET) =  1205.58   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) =   0.82

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     176.89
```



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  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.82
  HALFSTREET FLOOD WIDTH(FEET) =   39.52
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.62
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.23
STREET FLOW TRAVEL TIME(MIN.) =   2.64   Tc(MIN.) =   19.56
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.449
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       18.86      0.98     0.600    32
MOBILE HOME PARK            A       19.95      0.98     0.250    32
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.420
SUBAREA AREA(ACRES) =   38.81      SUBAREA RUNOFF(CFS) =   71.25
EFFECTIVE AREA(ACRES) =    110.15    AREA-AVERAGED Fm(INCH/HR) =  0.45
AREA-AVERAGED Fp(INCH/HR) =  0.97  AREA-AVERAGED Ap =  0.46
TOTAL AREA(ACRES) =      120.6        PEAK FLOW RATE(CFS) =     198.21

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) = 0.84   HALFSTREET FLOOD WIDTH(FEET) =  40.68
FLOW VELOCITY(FEET/SEC.) =  7.91   DEPTH*VELOCITY(FT*FT/SEC.) =   6.65

*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 MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY(FEET/SEC.) =  13.09
PIPE-FLOW(CFS) =      41.17
PIPEFLOW TRAVEL TIME(MIN.) =   1.53    Tc(MIN.) =  18.45
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.536
SUBAREA AREA(ACRES) =   38.81      SUBAREA RUNOFF(CFS) =   74.27
TOTAL AREA(ACRES) =      120.6        PEAK FLOW RATE(CFS) =     206.81

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) =  165.63
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.80
  HALFSTREET FLOOD WIDTH(FEET) =   38.85
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.48
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.01

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
    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
NEW PEAK FLOW DATA ARE:
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  PEAK FLOW RATE(CFS) =     206.81  Tc(MIN.) =   18.45
  AREA-AVERAGED Fm(INCH/HR) =  0.45  AREA-AVERAGED Fp(INCH/HR) =  0.97
  AREA-AVERAGED Ap =  0.46  EFFECTIVE AREA(ACRES) =     110.15
  LONGEST FLOWPATH FROM NODE  20200.00 TO NODE  20215.00 =    4656.69 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20215.00 TO NODE  20216.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1793.00  DOWNSTREAM ELEVATION(FEET) = 1740.00
  STREET LENGTH(FEET) =  1725.28   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) =     247.43
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.92
    HALFSTREET FLOOD WIDTH(FEET) =   44.59
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.80
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    7.16
  STREET FLOW TRAVEL TIME(MIN.) =   3.69   Tc(MIN.) =   22.14
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.273
  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       24.17      0.98     0.600    32
  SCHOOL                     A        9.62      0.98     0.600    32
  MOBILE HOME PARK           A       14.92      0.98     0.250    32
  COMMERCIAL                 A        0.89      0.98     0.100    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.13      0.75     0.600    56
  COMMERCIAL                 B        0.31      0.75     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.484
  SUBAREA AREA(ACRES) =   50.04      SUBAREA RUNOFF(CFS) =   81.17
  EFFECTIVE AREA(ACRES) =    160.19    AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.97  AREA-AVERAGED Ap =  0.50
  TOTAL AREA(ACRES) =      170.6        PEAK FLOW RATE(CFS) =     257.63

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.93   HALFSTREET FLOOD WIDTH(FEET) =  45.08
  FLOW VELOCITY(FEET/SEC.) =  7.90   DEPTH*VELOCITY(FT*FT/SEC.) =   7.34
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  *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) =  33.00    NUMBER OF PIPES =   1
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.38
  PIPE-FLOW(CFS) =      85.46
  PIPEFLOW TRAVEL TIME(MIN.) =   2.00    Tc(MIN.) =  20.45
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.384
  SUBAREA AREA(ACRES) =   50.04      SUBAREA RUNOFF(CFS) =   86.16
  TOTAL AREA(ACRES) =      170.6        PEAK FLOW RATE(CFS) =     273.59

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
  STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =  188.13
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.85
    HALFSTREET FLOOD WIDTH(FEET) =   41.35
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.19
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.14

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   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
      2      261.64   24.10    2.161  0.97( 0.46) 0.47     170.6   20200.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     277.91  Tc(MIN.) =   20.45
  AREA-AVERAGED Fm(INCH/HR) =  0.46  AREA-AVERAGED Fp(INCH/HR) =  0.97
  AREA-AVERAGED Ap =  0.47  EFFECTIVE AREA(ACRES) =     160.19
  LONGEST FLOWPATH FROM NODE  20200.00 TO NODE  20216.00 =    6381.97 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20216.00 TO NODE  20232.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1740.00  DOWNSTREAM ELEVATION(FEET) = 1739.00
  STREET LENGTH(FEET) =  1052.00   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) =     286.38
    ***STREET FLOWING FULL***
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  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      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
MOBILE HOME PARK           A        0.63      0.98     0.250    32
COMMERCIAL                 B        1.46      0.75     0.100    56
MOBILE HOME PARK           B        4.91      0.75     0.250    56
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
```



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----------------------------------------------------------------------------
  >>>>>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 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
  "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) =     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      Fp         Ap     SCS
       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
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  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.600
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     18.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.46
  AVERAGE FLOW DEPTH(FEET) =   0.57   FLOOD WIDTH(FEET) =   28.91
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   2.06   Tc(MIN.) =   14.12
  SUBAREA AREA(ACRES) =    5.86       SUBAREA RUNOFF(CFS) =   12.62
  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) =      23.63

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

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.60   FLOOD WIDTH(FEET) =   32.65
  FLOW VELOCITY(FEET/SEC.) =   4.57   DEPTH*VELOCITY(FT*FT/SEC) =   2.75
  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) =      34.90
    ***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.) =    4.72
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.38
  STREET FLOW TRAVEL TIME(MIN.) =   1.25   Tc(MIN.) =   15.37
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.830
  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       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
  SUBAREA AREA(ACRES) =   11.15      SUBAREA RUNOFF(CFS) =   22.53
  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) =      44.69
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  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) = 0.54   HALFSTREET FLOOD WIDTH(FEET) =  19.84
  FLOW VELOCITY(FEET/SEC.) =  5.19   DEPTH*VELOCITY(FT*FT/SEC.) =   2.79
  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) =      52.32
    ***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.) =    6.11
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.27
  STREET FLOW TRAVEL TIME(MIN.) =   0.69   Tc(MIN.) =   16.06
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.756
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           A        2.51      0.98     0.250    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        4.90      0.98     0.600    32
  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) =   15.25
  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) =      58.48

  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) = 0.55   HALFSTREET FLOOD WIDTH(FEET) =  20.58
  FLOW VELOCITY(FEET/SEC.) =  6.36   DEPTH*VELOCITY(FT*FT/SEC.) =   3.51
  LONGEST FLOWPATH FROM NODE  20220.00 TO NODE  20224.00 =    1757.18 FEET.
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  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) =      68.27
    ***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.) =    6.15
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.66
  STREET FLOW TRAVEL TIME(MIN.) =   0.88   Tc(MIN.) =   16.94
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.670
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     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) =   19.58
  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) =      75.76

  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) = 0.61   HALFSTREET FLOOD WIDTH(FEET) =  23.69
  FLOW VELOCITY(FEET/SEC.) =  6.34   DEPTH*VELOCITY(FT*FT/SEC.) =   3.89
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  323.5 FT WITH ELEVATION-DROP =  10.0 FT, IS   36.8 CFS,
         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.

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  FLOW PROCESS FROM NODE  20225.00 TO NODE  20226.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
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  >>>>>(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) =      84.85
    ***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.) =    6.80
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.25
  STREET 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      Fp         Ap     SCS
       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) =   18.18
  EFFECTIVE AREA(ACRES) =     48.28    AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.98  AREA-AVERAGED Ap =  0.51
  TOTAL 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
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  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =     104.21
    ***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.) =    6.81
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.63
  STREET FLOW TRAVEL TIME(MIN.) =   0.99   Tc(MIN.) =   18.63
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.521
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           A        9.70      0.98     0.250    32
  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) =   25.11
  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) =     113.12

  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) = 0.70   HALFSTREET FLOOD WIDTH(FEET) =  27.84
  FLOW VELOCITY(FEET/SEC.) =  6.97   DEPTH*VELOCITY(FT*FT/SEC.) =   4.86
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  404.5 FT WITH ELEVATION-DROP =  12.0 FT, IS   46.1 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
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  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) =     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):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           A        4.46      0.98     0.250    32
  PUBLIC PARK                A        4.98      0.98     0.850    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        1.96      0.98     0.600    32
  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) =     129.23

  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
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    ***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         Ap     SCS
       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
  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
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    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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           A       11.14      0.98     0.250    32
  PUBLIC PARK                A        6.85      0.98     0.850    32
  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)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1800.00  DOWNSTREAM ELEVATION(FEET) = 1769.00
  STREET LENGTH(FEET) =   900.35   CURB HEIGHT(INCHES) =  6.0
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STREET HALFWIDTH(FEET) = 18.00

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

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(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) =     206.23
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.82
  HALFSTREET FLOOD WIDTH(FEET) =   34.25
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    8.53
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    7.03
STREET FLOW TRAVEL TIME(MIN.) =   1.76   Tc(MIN.) =   23.12
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.215
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
MOBILE HOME PARK           A       14.01      0.98     0.250    32
MOBILE HOME PARK           B        8.21      0.75     0.250    56
RESIDENTIAL
"3-4 DWELLINGS/ACRE"       A        2.69      0.98     0.600    32
RESIDENTIAL
"3-4 DWELLINGS/ACRE"       B        3.23      0.75     0.600    56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.88
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.324
SUBAREA AREA(ACRES) =   28.14      SUBAREA RUNOFF(CFS) =   48.92
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

*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.) =  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

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
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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) =  155.04
  ***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.) =    7.97
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.99
LONGEST FLOWPATH FROM NODE  20220.00 TO NODE  20231.00 =    5272.72 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  20231.00 TO NODE  20232.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>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
 STREET HALFWIDTH(FEET) = 18.00

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =     238.99
   ***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.) =    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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 MOBILE HOME PARK           A        0.17      0.98     0.250    32
 MOBILE HOME PARK           B        5.75      0.75     0.250    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B       11.10      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) =   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:
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  DEPTH(FEET) = 0.87   HALFSTREET FLOOD WIDTH(FEET) =  36.63
  FLOW VELOCITY(FEET/SEC.) =  8.72   DEPTH*VELOCITY(FT*FT/SEC.) =   7.61

  *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) =  33.00    NUMBER OF PIPES =   1
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.93
  PIPE-FLOW(CFS) =      88.75
  PIPEFLOW TRAVEL TIME(MIN.) =   1.01    Tc(MIN.) =  23.43
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.198
  SUBAREA AREA(ACRES) =   17.02      SUBAREA RUNOFF(CFS) =   28.18
  TOTAL AREA(ACRES) =      155.4        PEAK FLOW RATE(CFS) =     246.04

  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) =  157.28
    ***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.) =    7.88
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.99
  LONGEST FLOWPATH FROM NODE  20220.00 TO NODE  20232.00 =    6178.11 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20232.00 TO NODE  20232.00 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.) =   23.43
  RAINFALL INTENSITY(INCH/HR) =   2.20
  AREA-AVERAGED Fm(INCH/HR) =  0.44
  AREA-AVERAGED Fp(INCH/HR) =  0.94
  AREA-AVERAGED Ap =  0.47
  EFFECTIVE STREAM AREA(ACRES) =     155.45
  TOTAL STREAM AREA(ACRES) =     155.45
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     246.04

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      277.91   24.01    2.166  0.96( 0.44) 0.46     171.3   20210.00
      1      261.64   27.73    1.986  0.96( 0.45) 0.46     181.7   20200.00
      2      246.04   23.43    2.198  0.94( 0.44) 0.47     155.4   20220.00

  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      522.28   23.43    2.198  0.95( 0.44) 0.46     322.6   20220.00
      2      519.47   24.01    2.166  0.95( 0.44) 0.46     326.7   20210.00
      3      478.09   27.73    1.986  0.95( 0.44) 0.47     337.2   20200.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     522.28    Tc(MIN.) =    23.43
  EFFECTIVE AREA(ACRES) =     322.61   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) =     534.73
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  1.68
    HALFSTREET FLOOD WIDTH(FEET) =   82.67
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.16
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.98
  STREET FLOW TRAVEL TIME(MIN.) =   5.11   Tc(MIN.) =   28.54
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.952
  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        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) =   24.90
  EFFECTIVE AREA(ACRES) =    341.02    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) =     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
```

```
  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
```



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  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
  "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         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        1.59      0.98     0.600    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.06      0.75     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) =     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<<<<<
```

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==============================================================================
  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
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.953
  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        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    56
  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) =     35.14
  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(ACRES) =    6.66       SUBAREA RUNOFF(CFS) =   14.59
  EFFECTIVE 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) =      41.33

  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) =  0.65   FLOOD WIDTH(FEET) =   38.17
  FLOW VELOCITY(FEET/SEC.) =   6.05   DEPTH*VELOCITY(FT*FT/SEC) =   3.93
  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) = 26.00

  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) =      50.29
```



```
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.58
    HALFSTREET FLOOD WIDTH(FEET) =   21.05
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.44
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.15
  STREET FLOW TRAVEL TIME(MIN.) =   0.90   Tc(MIN.) =   15.21
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.848
  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        3.29      0.98     0.600    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.18      0.75     0.600    56
  RESIDENTIAL
  ".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(ACRES) =    8.59      SUBAREA RUNOFF(CFS) =   17.92
  EFFECTIVE AREA(ACRES) =     27.46    AREA-AVERAGED Fm(INCH/HR) =  0.52
  AREA-AVERAGED Fp(INCH/HR) =  0.85  AREA-AVERAGED Ap =  0.62
  TOTAL AREA(ACRES) =       27.5        PEAK FLOW RATE(CFS) =      57.45

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

  END OF SUBAREA STREET FLOW HYDRAULICS:
  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.

****************************************************************************
  FLOW PROCESS FROM NODE  20244.00 TO NODE  20245.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(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
  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) =   0.73

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      65.28
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.58
    HALFSTREET FLOOD WIDTH(FEET) =   21.22
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.95
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.05
  STREET FLOW TRAVEL TIME(MIN.) =   0.65   Tc(MIN.) =   15.87
```

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 * 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
 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    56
 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) =   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
 TOTAL AREA(ACRES) =       35.2        PEAK FLOW RATE(CFS) =      71.36

 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) = 0.60   HALFSTREET FLOOD WIDTH(FEET) =  21.99
 FLOW VELOCITY(FEET/SEC.) =  7.10   DEPTH*VELOCITY(FT*FT/SEC.) =   4.25
 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) =      81.22
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.68
   HALFSTREET FLOOD WIDTH(FEET) =   26.91
   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
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.672
 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        3.90      0.98     0.600    32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        5.36      0.75     0.600    56
 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
 SUBAREA AREA(ACRES) =   10.19      SUBAREA RUNOFF(CFS) =   19.72
 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) =      87.76

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.81

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.70   HALFSTREET FLOOD WIDTH(FEET) =  27.52
 FLOW VELOCITY(FEET/SEC.) =  5.88   DEPTH*VELOCITY(FT*FT/SEC.) =   4.10
 LONGEST FLOWPATH FROM NODE  20240.00 TO NODE  20246.00 =    2326.78 FEET.

****************************************************************************
 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)<<<<<
============================================================================
 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

 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) =      95.67
   ***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.) =    6.27
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.41
 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):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A        3.02      0.98     0.600    32
 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
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 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      Fp         Ap     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
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 TOTAL AREA(ACRES) =       61.3        PEAK FLOW RATE(CFS) =     111.66

 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      Fp         Ap     SCS
      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
 ".4 DWELLING/ACRE"         B        0.85      0.75     0.900    56
 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
```

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  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.77   HALFSTREET FLOOD WIDTH(FEET) =  31.19
  FLOW VELOCITY(FEET/SEC.) =  6.90   DEPTH*VELOCITY(FT*FT/SEC.) =   5.31
  LONGEST FLOWPATH FROM NODE  20240.00 TO NODE  20249.00 =    4503.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20249.00 TO NODE  20249.00 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.) =   22.22
  RAINFALL INTENSITY(INCH/HR) =   2.27
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.81
  AREA-AVERAGED Ap =  0.62
  EFFECTIVE STREAM AREA(ACRES) =      83.49
  TOTAL STREAM AREA(ACRES) =      83.49
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     132.65

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      522.28   25.69    2.079  0.94( 0.44) 0.47     341.0   20220.00
      1      519.47   26.27    2.052  0.94( 0.44) 0.47     345.2   20210.00
      1      478.09   30.05    1.893  0.94( 0.44) 0.47     355.6   20200.00
      2      132.65   22.22    2.268  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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      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
      3      635.83   26.27    2.052  0.91( 0.45) 0.50     428.6   20210.00
      4      582.53   30.05    1.893  0.91( 0.45) 0.50     439.1   20200.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     640.72    Tc(MIN.) =    25.69
  EFFECTIVE AREA(ACRES) =     424.51   AREA-AVERAGED Fm(INCH/HR) =  0.45
  AREA-AVERAGED Fp(INCH/HR) =  0.91  AREA-AVERAGED Ap =  0.50
  TOTAL AREA(ACRES) =      439.1
  LONGEST FLOWPATH FROM NODE  20200.00 TO NODE  20249.00 =    8708.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20249.00 TO NODE  20250.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
============================================================================
  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
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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) =     641.38
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  1.64
  HALFSTREET FLOOD WIDTH(FEET) =   80.84
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.23
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    8.59
STREET FLOW TRAVEL TIME(MIN.) =   1.25   Tc(MIN.) =   26.94
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.021
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
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.726
SUBAREA AREA(ACRES) =    1.00      SUBAREA RUNOFF(CFS) =    1.33
EFFECTIVE AREA(ACRES) =    425.51    AREA-AVERAGED Fm(INCH/HR) =  0.45
AREA-AVERAGED Fp(INCH/HR) =  0.91  AREA-AVERAGED Ap =  0.50
TOTAL AREA(ACRES) =      440.1        PEAK FLOW RATE(CFS) =     640.72
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 = 6.50

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 1.64   HALFSTREET FLOOD WIDTH(FEET) =  80.84
FLOW VELOCITY(FEET/SEC.) =  5.22   DEPTH*VELOCITY(FT*FT/SEC.) =   8.58

*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.) =  11.44
PIPE-FLOW(CFS) =     506.01
PIPEFLOW TRAVEL TIME(MIN.) =   0.57    Tc(MIN.) =  26.26
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.052
SUBAREA AREA(ACRES) =    1.00      SUBAREA RUNOFF(CFS) =    1.36
TOTAL AREA(ACRES) =      440.1        PEAK FLOW RATE(CFS) =     640.72
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 = 6.50
STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
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  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
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  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):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.58      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       54.48      0.75     0.900    56
  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.
   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) =     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       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1      636.58   22.80    2.234  0.90( 0.46) 0.51     379.5   20240.00
      2      640.72   26.26    2.052  0.91( 0.45) 0.50     425.5   20220.00
      3      635.83   26.84    2.025  0.91( 0.45) 0.50     429.6   20210.00
      4      582.53   30.62    1.872  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= 0.46;30M= 0.95;1H= 1.25;3H= 2.14;6H= 3.02;24H= 7.36
  S-GRAPH: VALLEY(DEV.)= 38.4%;VALLEY(UNDEV.)/DESERT= 61.6%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  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.
  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=.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) =     682.40
  PEAK FLOW RATE(CFS) =    2112.24

****************************************************************************
  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
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1733.00  DOWNSTREAM(FEET) =   1670.00
  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
  CHANNEL FLOW THRU SUBAREA(CFS) =    2112.24
  FLOW VELOCITY(FEET/SEC.) =  30.07   FLOW DEPTH(FEET) =   3.93
  TRAVEL TIME(MIN.) =   1.32   Tc(MIN.) =   38.33
  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 =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   38.33
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.636
  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        3.23      0.75     0.600    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        0.07      0.98     0.600    32
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        9.49      0.75     0.900    56
  SCHOOL                     B       24.91      0.75     0.600    56
  SCHOOL                     A        0.90      0.98     0.600    32
  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= 0.46;30M= 0.95;1H= 1.25;3H= 2.14;6H= 3.01;24H= 7.34
  S-GRAPH: VALLEY(DEV.)= 39.0%;VALLEY(UNDEV.)/DESERT= 61.0%
           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
  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=.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) =     693.41
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    2093.39
  TOTAL AREA(ACRES) =     2259.8       PEAK FLOW RATE(CFS) =    2112.24
  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

****************************************************************************
  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) =    2112.24    Tc(MIN.) =   38.33
  AREA-AVERAGED Fm(INCH/HR) =  0.58   Ybar = 0.52
  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
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.412
  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        4.43      0.61     1.000    66   11.82
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        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) =     22.63
  TOTAL AREA(ACRES) =      6.57   PEAK FLOW RATE(CFS) =     22.63

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
```

```
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 7.50

****************************************************************************
  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) =      22.63
  FLOW VELOCITY(FEET/SEC.) =   3.78   FLOW DEPTH(FEET) =   0.35
  TRAVEL TIME(MIN.) =   2.58   Tc(MIN.) =    9.91
  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.) =    9.91
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.683
  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        4.44      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       15.90      0.61     1.000    66
  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) =   56.54
  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) =      74.86

  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  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) =      74.86
  FLOW VELOCITY(FEET/SEC.) =   4.75   FLOW DEPTH(FEET) =   0.56
  TRAVEL TIME(MIN.) =   3.49   Tc(MIN.) =   13.40
  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.) =   13.40
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.073
  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        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) =   20.23
  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) =      80.32

  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  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) =      80.32
  FLOW VELOCITY(FEET/SEC.) =   4.17   FLOW DEPTH(FEET) =   0.62
  TRAVEL TIME(MIN.) =   3.14   Tc(MIN.) =   16.54
  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.) =   16.54
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.708
  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       17.48      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        7.48      0.61     1.000    66
  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) =   48.47
  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) =     117.07

  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  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.) =   19.46
  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.) =   19.46
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.456
  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        6.85      0.75     0.700    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.71      0.75     0.900    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       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) =  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
  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.) =   22.46
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.254
  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       10.89      0.75     0.700    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       11.99      0.75     0.900    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        4.30      0.61     1.000    66
  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) =   40.36
  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) =     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.) =   25.60
  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.) =   25.60
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.084
  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       53.81      0.75     0.700    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       46.51      0.75     0.900    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       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) =  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       30.11      0.75     0.900    56
  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 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) =     445.57
```



```
  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         Ap     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"       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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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"               B        5.28      0.61     1.000    66
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       40.34      0.75     0.700    56
  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) =  134.56
  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) =     586.25

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 4.17

****************************************************************************
  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
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =     667.58
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  1.30
    HALFSTREET FLOOD WIDTH(FEET) =   63.88
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    9.07
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   11.84
  STREET FLOW TRAVEL TIME(MIN.) =   1.27   Tc(MIN.) =   32.89
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.793
  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      100.00      0.75     0.900    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       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
```



```
  "OPEN BRUSH"               B        0.17      0.61     1.000    66
  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) =  162.65
  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) =     728.45

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.40; 6HR = 1.91; 24HR = 4.34

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 1.34   HALFSTREET FLOOD WIDTH(FEET) =  65.77
  FLOW VELOCITY(FEET/SEC.) =  9.28   DEPTH*VELOCITY(FT*FT/SEC.) =  12.46

  *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) =  72.00    NUMBER OF PIPES =   1
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  20.31
  PIPE-FLOW(CFS) =     574.63
  PIPEFLOW TRAVEL TIME(MIN.) =   0.57    Tc(MIN.) =  32.18
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.816
  SUBAREA AREA(ACRES) =  156.71      SUBAREA RUNOFF(CFS) =  165.95
  TOTAL AREA(ACRES) =      685.7       PEAK FLOW RATE(CFS) =     742.90

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.40; 6HR = 1.91; 24HR = 4.34
  STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =  168.27
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.87
    HALFSTREET FLOOD WIDTH(FEET) =   42.09
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.14
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.34
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =   692.8 FT WITH ELEVATION-DROP =  15.0 FT, IS  369.7 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= 0.40;30M= 0.82;1H= 1.09;3H= 1.77;6H= 2.41;24H= 6.18
  S-GRAPH: VALLEY(DEV.)= 28.6%;VALLEY(UNDEV.)/DESERT= 71.4%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.54; LAG(HR) = 0.43; Fm(INCH/HR) = 0.61; 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 = 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=.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) =     790.25
   ***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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 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.
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  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  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.
  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) = 16.42  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 Tc :
 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
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STREET HALFWIDTH(FEET) = 18.00

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

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(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) =     769.30
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  1.34
  HALFSTREET FLOOD WIDTH(FEET) =   60.07
  AVERAGE FLOW VELOCITY(FEET/SEC.) =   10.55
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   14.16
STREET FLOW TRAVEL TIME(MIN.) =   1.97   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
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
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
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) =      839.2
LONGEST FLOWPATH FROM NODE  20260.00 TO NODE  20273.00 =   11605.33 FEET.
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3,n=.0536; Lca/L=0.4,n=.0480; Lca/L=0.5,n=.0441;Lca/L=0.6,n=.0412
TIME OF PEAK FLOW(HR) = 16.50  RUNOFF VOLUME(AF) =     190.65
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =     717.74
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

END OF SUBAREA STREET FLOW HYDRAULICS:
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 **
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  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 Tc :
  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) =     744.41
    ***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
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  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      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
RESIDENTIAL
".4 DWELLING/ACRE"         B        2.08      0.75     0.900    56
SCHOOL                     B        0.94      0.75     0.600    56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.807
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
```



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  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) =  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      Q        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.
   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
  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
============================================================================
```

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================================================================================
  END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
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             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 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-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
```



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 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)
        VALLEY(DEVELOPED)                   1.000
        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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.287
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.100
  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        6.22      0.61     1.000    66   12.01
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.99      0.75     0.900    56    8.29
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.63
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.986
  SUBAREA RUNOFF(CFS) =     22.57
  TOTAL 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)<<<<<
========================================================================
```

```
  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) =      22.57
  FLOW VELOCITY(FEET/SEC.) =   2.53   FLOW DEPTH(FEET) =   0.42
  TRAVEL TIME(MIN.) =   2.78   Tc(MIN.) =   11.07
  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.) =   11.07
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.446
  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        0.12      0.75     0.900    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        4.14      0.61     1.000    66
  SCHOOL                     B        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) =   20.72
  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) =      39.04

  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  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) =      39.04
  FLOW VELOCITY(FEET/SEC.) =   3.34   FLOW DEPTH(FEET) =   0.48
  TRAVEL TIME(MIN.) =   4.34   Tc(MIN.) =   15.42
  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.) =   15.42
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.825
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```



```
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        4.15      0.61     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.80      0.75     0.900    56
  SCHOOL                     B       20.38      0.75     0.600    56
  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) =   53.39
  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) =      83.98

  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  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) =      83.98
  FLOW VELOCITY(FEET/SEC.) =   3.36   FLOW DEPTH(FEET) =   0.71
  TRAVEL TIME(MIN.) =   4.86   Tc(MIN.) =   20.28
  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.) =   20.28
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.397
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       18.37      0.61     1.000    66
  SCHOOL                     B       15.66      0.75     0.600    56
  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) =   56.92
  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) =     125.31

  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  20305.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
```

```
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2280.00  DOWNSTREAM(FEET) =   2220.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   823.37   CHANNEL SLOPE =  0.0729
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     125.31
  FLOW VELOCITY(FEET/SEC.) =   4.61   FLOW DEPTH(FEET) =   0.74
  TRAVEL TIME(MIN.) =   2.98   Tc(MIN.) =   23.25
  LONGEST FLOWPATH FROM NODE  20300.00 TO NODE  20305.00 =    3755.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20305.00 TO NODE  20305.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   23.25
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.208
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        9.94      0.61     1.000    66
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        0.01      0.75     0.700    56
  SCHOOL                     B        7.91      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.66
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.823
  SUBAREA AREA(ACRES) =   17.86      SUBAREA RUNOFF(CFS) =   26.79
  EFFECTIVE AREA(ACRES) =     92.35   AREA-AVERAGED Fm(INCH/HR) =  0.53
  AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap =  0.79
  TOTAL AREA(ACRES) =       92.3       PEAK FLOW RATE(CFS) =     139.43

  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  20305.00 TO NODE  20306.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2220.00  DOWNSTREAM(FEET) =   2190.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   801.97   CHANNEL SLOPE =  0.0374
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   3.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     139.43
  FLOW VELOCITY(FEET/SEC.) =   3.66   FLOW DEPTH(FEET) =   0.87
  TRAVEL TIME(MIN.) =   3.65   Tc(MIN.) =   26.90
  LONGEST FLOWPATH FROM NODE  20300.00 TO NODE  20306.00 =    4557.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20306.00 TO NODE  20306.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   26.90
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.023
```



```
  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        1.66      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       13.33      0.61     1.000    66
  SCHOOL                     B        2.17      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.63
  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
  AREA-AVERAGED Fp(INCH/HR) =  0.66  AREA-AVERAGED Ap =  0.81
  TOTAL AREA(ACRES) =      109.5       PEAK FLOW RATE(CFS) =     146.27

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

****************************************************************************
  FLOW PROCESS FROM NODE  20306.00 TO NODE  20307.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2190.00  DOWNSTREAM(FEET) =   2185.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   181.13   CHANNEL SLOPE =  0.0276
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   3.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     146.27
  FLOW VELOCITY(FEET/SEC.) =   3.30   FLOW DEPTH(FEET) =   0.94
  TRAVEL TIME(MIN.) =   0.91   Tc(MIN.) =   27.82
  LONGEST FLOWPATH FROM NODE  20300.00 TO NODE  20307.00 =    4739.04 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20307.00 TO NODE  20307.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   27.82
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.982
  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        1.33      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.26      0.75     0.600    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        3.26      0.61     1.000    66
  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
  EFFECTIVE AREA(ACRES) =    114.36   AREA-AVERAGED Fm(INCH/HR) =  0.54
  AREA-AVERAGED Fp(INCH/HR) =  0.66  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =      114.4       PEAK FLOW RATE(CFS) =     148.43

  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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        2.10      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.65      0.75     0.600    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        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
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  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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         Ap     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
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  **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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        3.69      0.75     0.700    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) =    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
```



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  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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        2.87      0.75     0.700    56
 NATURAL FAIR COVER
 "OPEN BRUSH"               B        1.50      0.61     1.000    66
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        0.78      0.75     0.600    56
 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 Tc :
 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.

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 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)<<<<<
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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      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 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
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  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.

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  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      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"          B        6.45      0.75     0.700    56
  RESIDENTIAL
  "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) =   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
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  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.

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  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
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    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      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"                B        3.76      0.61     1.000    66
  RESIDENTIAL
  "2 DWELLINGS/ACRE"          B        5.77      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
  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.

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  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)<<<<<
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  UPSTREAM ELEVATION(FEET) = 2020.00  DOWNSTREAM ELEVATION(FEET) = 1980.00
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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      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
RESIDENTIAL
"2 DWELLINGS/ACRE"         B        6.85      0.75     0.700    56
RESIDENTIAL
"3-4 DWELLINGS/ACRE"       B        1.24      0.75     0.600    56
NATURAL FAIR COVER
"OPEN BRUSH"               B        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
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  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.

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  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) =     203.87
    ***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      Fp         Ap     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    56
  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
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  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.

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  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
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  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        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) =    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.

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

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(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      Fp         Ap     SCS
     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"         B        0.01      0.75     0.900    56
RESIDENTIAL
"2 DWELLINGS/ACRE"         B       10.92      0.75     0.700    56
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 :
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  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =   55.35
    ***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      Fp         Ap     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
  "2 DWELLINGS/ACRE"         B      100.00      0.75     0.700    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       28.82      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       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) =  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
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  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:
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    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         Ap     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) =    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.

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  FLOW PROCESS FROM NODE  20330.00 TO NODE  20330.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
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================================================================================
  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 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) =     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      Fp         Ap     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    56
  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      Fp         Ap     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"               B        8.32      0.61     1.000    66
  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

****************************************************************************
```

```
  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
  MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      56.20
  FLOW VELOCITY(FEET/SEC.) =   3.76   FLOW DEPTH(FEET) =   0.55
  TRAVEL TIME(MIN.) =   3.00   Tc(MIN.) =   31.01
  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.) =   31.01
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.857
  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       14.74      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) =   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) =      69.15

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.93; 1HR = 1.23; 3HR = 2.02; 6HR = 2.75; 24HR = 6.50

****************************************************************************
  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) =      69.15
  FLOW VELOCITY(FEET/SEC.) =   2.89   FLOW DEPTH(FEET) =   0.69
  TRAVEL TIME(MIN.) =   3.64   Tc(MIN.) =   34.65
  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.) =   34.65
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.738
```



```
  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       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) =   11.92
  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) =      74.63

  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  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) =      74.63
  FLOW VELOCITY(FEET/SEC.) =   3.34   FLOW DEPTH(FEET) =   0.67
  TRAVEL TIME(MIN.) =   3.43   Tc(MIN.) =   38.08
  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.) =   38.08
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.642
  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       48.19      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.06      0.75     0.600    56
  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) =   48.58
  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) =     117.11

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.44; 30M = 0.91; 1HR = 1.20; 3HR = 2.00; 6HR = 2.75; 24HR = 6.50

****************************************************************************
  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) =     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      Fp         Ap     SCS
       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) =   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      Fp         Ap     SCS
```



```
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       25.33      0.75     0.700    56
  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 =  0.699
  SUBAREA AREA(ACRES) =   25.60      SUBAREA RUNOFF(CFS) =   20.67
  EFFECTIVE AREA(ACRES) =    160.82   AREA-AVERAGED Fm(INCH/HR) =  0.54
  AREA-AVERAGED Fp(INCH/HR) =  0.71  AREA-AVERAGED Ap =  0.76
  TOTAL AREA(ACRES) =      160.8       PEAK FLOW RATE(CFS) =     127.02

  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  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) =     132.38
    ***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.) =    8.54
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.84
  STREET FLOW TRAVEL TIME(MIN.) =   2.10   Tc(MIN.) =   50.62
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.384
  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) =   10.72
  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) =     132.59

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
```

```
  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.68   HALFSTREET FLOOD WIDTH(FEET) =  27.17
  FLOW VELOCITY(FEET/SEC.) =  8.56   DEPTH*VELOCITY(FT*FT/SEC.) =   5.85
  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
----------------------------------------------------------------------------
  >>>>>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) =     138.83
    ***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.) =    9.61
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.38
  STREET FLOW TRAVEL TIME(MIN.) =   1.61   Tc(MIN.) =   52.23
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.358
  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        0.48      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        5.88      0.75     0.900    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       11.27      0.75     0.700    56
  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) =   12.49
  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) =     141.03

  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) = 0.67   HALFSTREET FLOOD WIDTH(FEET) =  26.37
  FLOW VELOCITY(FEET/SEC.) =  9.63   DEPTH*VELOCITY(FT*FT/SEC.) =   6.43
```



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  *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
         THE MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.66
  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.) =  16.44
  PIPE-FLOW(CFS) =      51.70
  PIPEFLOW TRAVEL TIME(MIN.) =   0.94    Tc(MIN.) =  51.56
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.369
  SUBAREA AREA(ACRES) =   17.63      SUBAREA RUNOFF(CFS) =   12.65
  TOTAL AREA(ACRES) =      192.3        PEAK FLOW RATE(CFS) =     142.86

  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) =   91.16
    ***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.) =    8.50
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.99
  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.) =   51.56
  RAINFALL INTENSITY(INCH/HR) =   1.37
  AREA-AVERAGED Fm(INCH/HR) =  0.54
  AREA-AVERAGED Fp(INCH/HR) =  0.72
  AREA-AVERAGED Ap =  0.76
  EFFECTIVE STREAM AREA(ACRES) =     192.29
  TOTAL STREAM AREA(ACRES) =     192.29
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     142.86

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (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
      2      142.86   51.56    1.369  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      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      527.10   34.94    1.729  0.71( 0.54) 0.77     491.8   20300.00
      2      413.39   51.56    1.369  0.71( 0.54) 0.77     553.8   20320.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
```

```
  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) =     534.13
    ***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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.05      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       12.65      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) =   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
```



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         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 Tc :
  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 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        6.76      0.75     0.700    56   13.21
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        4.25      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.25      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) =    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         Ap     SCS
       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"       B        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) =   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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        2.06      0.75     0.700    56
  RESIDENTIAL
```

```
  ".4 DWELLING/ACRE"         B        2.77      0.75     0.900    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.07      0.75     0.600    56
  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) =    7.75
  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) =      37.87

  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  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) =      37.87
  FLOW VELOCITY(FEET/SEC.) =   3.21   FLOW DEPTH(FEET) =   0.49
  TRAVEL TIME(MIN.) =   2.98   Tc(MIN.) =   23.74
  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.) =   23.74
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.180
  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       12.00      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.27      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        3.29      0.75     0.900    56
  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) =   22.78
  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) =      56.85

  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  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) =      56.85
  FLOW VELOCITY(FEET/SEC.) =   3.73   FLOW DEPTH(FEET) =   0.55
  TRAVEL TIME(MIN.) =   2.50   Tc(MIN.) =   26.23
  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.) =   26.23
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.053
  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        3.53      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.62      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        3.41      0.75     0.900    56
  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) =    9.99
  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) =      62.44

  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  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
  STREET HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      69.09
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    ***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.) =    7.27
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.06
  STREET FLOW TRAVEL TIME(MIN.) =   2.28   Tc(MIN.) =   28.51
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.953
  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        2.71      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        6.04      0.75     0.700    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        1.62      0.75     0.900    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.705
  SUBAREA AREA(ACRES) =   10.37      SUBAREA RUNOFF(CFS) =   13.31
  EFFECTIVE AREA(ACRES) =     56.51    AREA-AVERAGED Fm(INCH/HR) =  0.55
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.73
  TOTAL AREA(ACRES) =       56.5        PEAK FLOW RATE(CFS) =      71.59

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.56   HALFSTREET FLOOD WIDTH(FEET) =  21.19
  FLOW VELOCITY(FEET/SEC.) =  7.37   DEPTH*VELOCITY(FT*FT/SEC.) =   4.16
  LONGEST FLOWPATH FROM NODE  20340.00 TO NODE  20347.00 =    4458.51 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20347.00 TO NODE  20348.00 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) =   874.50   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) =   0.78

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      79.75
    ***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.) =    6.67
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    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.09
  STREET FLOW TRAVEL TIME(MIN.) =   2.18   Tc(MIN.) =   30.70
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.869
  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        0.78      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       12.66      0.75     0.700    56
  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) =   16.32
  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) =      83.61

  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) = 0.62   HALFSTREET FLOOD WIDTH(FEET) =  24.12
  FLOW VELOCITY(FEET/SEC.) =  6.76   DEPTH*VELOCITY(FT*FT/SEC.) =   4.21
  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) =     102.96
    ***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.) =    9.23
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.50
  STREET FLOW TRAVEL TIME(MIN.) =   1.96   Tc(MIN.) =   32.65
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.801
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
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"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) =   38.70
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) =     118.03

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) =  24.05
FLOW VELOCITY(FEET/SEC.) =  9.59   DEPTH*VELOCITY(FT*FT/SEC.) =   5.96
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 1082.4 FT WITH ELEVATION-DROP =  75.0 FT, IS   86.2 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.

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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.) =   32.65
RAINFALL INTENSITY(INCH/HR) =   1.80
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 =     118.03

** CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
    1      527.10   36.19    1.693  0.71( 0.54) 0.76     505.5   20300.00
    1      413.39   52.82    1.349  0.71( 0.54) 0.76     567.5   20320.00
    2      118.03   32.65    1.801  0.75( 0.53) 0.71     103.6   20340.00

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      638.07   32.65    1.801  0.71( 0.54) 0.76     559.6   20340.00
    2      635.07   36.19    1.693  0.71( 0.54) 0.76     609.1   20300.00
    3      489.34   52.82    1.349  0.71( 0.54) 0.76     671.1   20320.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =     638.07    Tc(MIN.) =    32.65
EFFECTIVE AREA(ACRES) =     559.63   AREA-AVERAGED Fm(INCH/HR) =  0.54
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AREA-AVERAGED Fp(INCH/HR) =  0.71  AREA-AVERAGED Ap =  0.76
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= 0.46;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%
         MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
Tc(HR) = 0.60; LAG(HR) = 0.48; Fm(INCH/HR) = 0.54; Ybar = 0.50
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
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=.0500; Lca/L=0.4,n=.0448; Lca/L=0.5,n=.0412;Lca/L=0.6,n=.0384
TIME OF PEAK FLOW(HR) = 16.50  RUNOFF VOLUME(AF) =     201.03
UNIT-HYDROGRAPH METHOD PEAK FLOW RATE(CFS) =    776.51
TOTAL PEAK FLOW RATE(CFS) =    776.51 (SOURCE FLOW INCLUDED)
RATIONAL METHOD PEAK FLOW RATE(CFS) =    638.07
 (UPSTREAM NODE PEAK FLOW RATE(CFS) =    638.07)
PEAK FLOW RATE(CFS) USED =    776.51

****************************************************************************
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

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(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) =     810.65
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  1.22
  HALFSTREET FLOOD WIDTH(FEET) =   53.84
  AVERAGE FLOW VELOCITY(FEET/SEC.) =   13.81
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   16.80
STREET FLOW TRAVEL TIME(MIN.) =   1.56   Tc(MIN.) =   37.75
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.651
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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        4.52      0.75     0.600    56
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= 0.46;30M= 0.94;1H= 1.24;3H= 2.02;6H= 2.75;24H= 6.80
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) = 0.55; 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;
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=.0530; Lca/L=0.4,n=.0475; Lca/L=0.5,n=.0436;Lca/L=0.6,n=.0407
TIME OF PEAK FLOW(HR) = 16.58  RUNOFF VOLUME(AF) =     217.83
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =     842.33
TOTAL AREA(ACRES) =      747.7        PEAK FLOW RATE(CFS) =     842.33

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) = 1.23   HALFSTREET FLOOD WIDTH(FEET) =  54.63
FLOW VELOCITY(FEET/SEC.) = 13.94   DEPTH*VELOCITY(FT*FT/SEC.) =  17.18

*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) =  66.00    NUMBER OF PIPES =   1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY(FEET/SEC.) =  30.33
PIPE-FLOW(CFS) =     721.28
PIPEFLOW TRAVEL TIME(MIN.) =   0.71    Tc(MIN.) =  36.90
UNIT-HYDROGRAPH DATA:
RAINFALL(INCH): 5M= 0.46;30M= 0.94;1H= 1.24;3H= 2.02;6H= 2.75;24H= 6.80
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) = 0.55; 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;
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=.0463; Lca/L=0.4,n=.0415; Lca/L=0.5,n=.0381;Lca/L=0.6,n=.0356
TIME OF PEAK FLOW(HR) = 16.50  RUNOFF VOLUME(AF) =     217.83
TOTAL AREA(ACRES) =      747.7        PEAK FLOW RATE(CFS) =     846.19

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
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STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =  124.91
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.66
  HALFSTREET FLOOD WIDTH(FEET) =   25.76
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    8.92
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.84
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L =  1290.2 FT WITH ELEVATION-DROP =  70.0 FT, IS  170.7 CFS,
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE  20350.00

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 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) =     880.81
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  1.43
  HALFSTREET FLOOD WIDTH(FEET) =   64.28
  AVERAGE FLOW VELOCITY(FEET/SEC.) =   10.57
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   15.06
 STREET FLOW TRAVEL TIME(MIN.) =   2.12   Tc(MIN.) =   39.02
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.618
 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        7.14      0.75     0.600    56
 RESIDENTIAL
 ".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= 0.46;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) = 0.65; LAG(HR) = 0.52; 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
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 UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =      827.4
 LONGEST FLOWPATH FROM NODE  20300.00 TO NODE  20351.00 =   13803.84 FEET.
  EQUIVALENT 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.
  EQUIVALENT 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
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 STREET HALFWIDTH(FEET) = 18.00

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      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) =      843.8
 LONGEST FLOWPATH FROM NODE  20300.00 TO NODE  20352.00 =   15145.87 FEET.
  EQUIVALENT 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 **
```

```
  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
```



```
  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) =    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      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  SCHOOL                      B       10.49      0.75     0.600    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        B        1.59      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"          B       21.45      0.75     0.900    56
  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
```

```
  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 =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  PEAK FLOW RATE(CFS) =     2598.30    Tc(MIN.) =   38.67
  AREA-AVERAGED Fm(INCH/HR) =  0.59    Ybar = 0.54
  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) =      928.70    Tc(MIN.) =   38.66
  AREA-AVERAGED Fm(INCH/HR) =  0.56    Ybar = 0.53
  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= 0.45;30M= 0.93;1H= 1.22;3H= 2.05;6H= 2.84;24H= 6.99
  S-GRAPH: VALLEY(DEV.)= 49.4%;VALLEY(UNDEV.)/DESERT= 50.6%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.64; LAG(HR) = 0.52; 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) =     3979.3
  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) =    1111.72
  PEAK FLOW RATE(CFS) =    3196.90

****************************************************************************
  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) =    3196.90
  FLOW VELOCITY(FEET/SEC.) =  30.40   FLOW DEPTH(FEET) =   4.85
  TRAVEL TIME(MIN.) =   0.80   Tc(MIN.) =   39.47
  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.) =   39.47
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.607
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  SCHOOL                      B       20.64      0.75     0.600    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        B        1.09      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"          B       25.75      0.75     0.900    56
  NATURAL FAIR COVER
  "OPEN BRUSH"                B        2.69      0.61     1.000    66
  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= 0.45;30M= 0.93;1H= 1.22;3H= 2.05;6H= 2.84;24H= 6.98
  S-GRAPH: VALLEY(DEV.)= 50.0%;VALLEY(UNDEV.)/DESERT= 50.0%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.66; LAG(HR) = 0.53; Fm(INCH/HR) = 0.58; Ybar = 0.54
  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) =     4029.5
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  20353.00 =   21552.11 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0366; Lca/L=0.4,n=.0329; Lca/L=0.5,n=.0302;Lca/L=0.6,n=.0282
  TIME OF PEAK FLOW(HR) = 16.58  RUNOFF VOLUME(AF) =    1124.14
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    3202.12
  TOTAL AREA(ACRES) =     4029.5       PEAK FLOW RATE(CFS) =    3202.12

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50

****************************************************************************
  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
  CHANNEL BASE(FEET) =   12.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   6.00
  CHANNEL FLOW THRU SUBAREA(CFS) =    3202.12
  FLOW VELOCITY(FEET/SEC.) =  29.09   FLOW DEPTH(FEET) =   5.00
  TRAVEL TIME(MIN.) =   0.78   Tc(MIN.) =   40.25
  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<<<<<
```

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==========================================================================
  MAINLINE Tc(MIN.) =   40.25
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.588
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B       13.67      0.75     0.250    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       19.97      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        5.87      0.75     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 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        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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        5.52      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.40      0.75     0.600    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        3.20      0.61     1.000    66
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        3.04      0.75     0.400    56
  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) =   25.50
  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<<<<<
```

```
  >>>>>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) =      39.19
  FLOW VELOCITY(FEET/SEC.) =   2.94   FLOW DEPTH(FEET) =   0.58
  TRAVEL TIME(MIN.) =   2.78   Tc(MIN.) =   18.26
  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.) =   18.26
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.552
  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        2.09      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        5.13      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.30      0.61     1.000    66
  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) =   13.85
  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) =      48.54

  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  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) =      48.54
  FLOW VELOCITY(FEET/SEC.) =   2.14   FLOW DEPTH(FEET) =   0.67
  TRAVEL TIME(MIN.) =   4.37   Tc(MIN.) =   22.63
  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.) =   22.63
```



```
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.244
  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       10.47      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.47      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) =   11.94      SUBAREA RUNOFF(CFS) =   18.59
  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) =      59.82

  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  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) =      59.82
  FLOW VELOCITY(FEET/SEC.) =   2.21   FLOW DEPTH(FEET) =   0.74
  TRAVEL TIME(MIN.) =   4.42   Tc(MIN.) =   27.05
  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.) =   27.05
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.016
  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        0.95      0.75     0.600    56
  RESIDENTIAL
  "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) =   17.38
  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

  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  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) =      69.36
 FLOW VELOCITY(FEET/SEC.) =   3.67   FLOW DEPTH(FEET) =   0.62
 TRAVEL TIME(MIN.) =   2.69   Tc(MIN.) =   29.74
 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.) =   29.74
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.905
 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        0.40      0.75     0.600    56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        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) =   10.43
 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) =      74.65

 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  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) =      74.65
 FLOW VELOCITY(FEET/SEC.) =   2.39   FLOW DEPTH(FEET) =   0.79
 TRAVEL TIME(MIN.) =   5.80   Tc(MIN.) =   35.54
 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.) =   35.54
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.712
 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       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) =   47.89
 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

 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  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) =     112.20
 FLOW VELOCITY(FEET/SEC.) =   4.49   FLOW DEPTH(FEET) =   0.71
 TRAVEL TIME(MIN.) =   3.52   Tc(MIN.) =   39.06
 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.) =   39.06
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.617
 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       15.48      0.75     0.700    56
 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) =   15.41
 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) =     118.78

 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  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) =     118.78
  FLOW VELOCITY(FEET/SEC.) =   4.66   FLOW DEPTH(FEET) =   0.71
  TRAVEL TIME(MIN.) =   3.19   Tc(MIN.) =   42.25
  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.) =   42.25
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.543
  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       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 AREA(ACRES) =   29.70      SUBAREA RUNOFF(CFS) =   27.23
  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) =     137.98

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.43; 30M = 0.88; 1HR = 1.16; 3HR = 1.97; 6HR = 2.75; 24HR = 6.42

****************************************************************************
  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) =     137.98
  FLOW VELOCITY(FEET/SEC.) =   3.82   FLOW DEPTH(FEET) =   0.85
  TRAVEL TIME(MIN.) =   4.14   Tc(MIN.) =   46.39
  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<<<<<
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============================================================================
  MAINLINE Tc(MIN.) =   46.39
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.459
  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        9.75      0.75     0.900    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.37      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        7.31      0.75     0.700    56
  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) =   13.38
  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) =     140.04

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.94; 1HR = 1.24; 3HR = 2.02; 6HR = 2.75; 24HR = 5.95

****************************************************************************
  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) =     142.35
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.80
    HALFSTREET FLOOD WIDTH(FEET) =   33.09
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.29
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.04
  STREET FLOW TRAVEL TIME(MIN.) =   2.04   Tc(MIN.) =   48.44
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.421
  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        1.23      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.24      0.75     0.900    56
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  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        4.18      0.75     0.700    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.687
  SUBAREA AREA(ACRES) =    5.65      SUBAREA RUNOFF(CFS) =    4.62
  EFFECTIVE AREA(ACRES) =    172.49    AREA-AVERAGED Fm(INCH/HR) =  0.53
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.71
  TOTAL AREA(ACRES) =      172.5        PEAK FLOW RATE(CFS) =     140.04
  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) = 0.80   HALFSTREET FLOOD WIDTH(FEET) =  32.90
  FLOW VELOCITY(FEET/SEC.) =  6.26   DEPTH*VELOCITY(FT*FT/SEC.) =   4.99
  LONGEST FLOWPATH FROM NODE  20360.00 TO NODE  20371.00 =    8120.76 FEET.

****************************************************************************
  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)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1845.00  DOWNSTREAM ELEVATION(FEET) = 1825.00
  STREET LENGTH(FEET) =   580.50   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) =     155.58
    ***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.) =    7.97
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.00
  STREET FLOW TRAVEL TIME(MIN.) =   1.21   Tc(MIN.) =   49.65
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.400
  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        3.05      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       36.06      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) =   39.11      SUBAREA RUNOFF(CFS) =   31.07
  EFFECTIVE AREA(ACRES) =    211.60    AREA-AVERAGED Fm(INCH/HR) =  0.52
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  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.70
  TOTAL AREA(ACRES) =      211.6        PEAK FLOW RATE(CFS) =     166.88

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.90; 1HR = 1.18; 3HR = 1.99; 6HR = 2.75; 24HR = 5.50

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.77   HALFSTREET FLOOD WIDTH(FEET) =  31.50
  FLOW VELOCITY(FEET/SEC.) =  8.11   DEPTH*VELOCITY(FT*FT/SEC.) =   6.24

  *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 MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.31
  PIPE-FLOW(CFS) =      38.71
  PIPEFLOW TRAVEL TIME(MIN.) =   0.79    Tc(MIN.) =  49.22
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.408
  SUBAREA AREA(ACRES) =   39.11      SUBAREA RUNOFF(CFS) =   31.32
  TOTAL AREA(ACRES) =      211.6        PEAK FLOW RATE(CFS) =     168.27

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.90; 1HR = 1.18; 3HR = 1.99; 6HR = 2.75; 24HR = 5.50
  STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =  129.56
    ***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.) =    7.63
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.42
  LONGEST FLOWPATH FROM NODE  20360.00 TO NODE  20372.00 =    8701.26 FEET.

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  FLOW PROCESS FROM NODE  20372.00 TO NODE  20373.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 18 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1825.00  DOWNSTREAM ELEVATION(FEET) = 1770.00
  STREET LENGTH(FEET) =  1298.78   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) =   0.77

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     198.27
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
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  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      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
RESIDENTIAL
"3-4 DWELLINGS/ACRE"       B        6.56      0.75     0.600    56
RESIDENTIAL
".4 DWELLING/ACRE"         B       75.29      0.75     0.900    56
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 Tc :
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.

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 FLOW PROCESS FROM NODE  20373.00 TO NODE  20374.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 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
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 * 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.

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 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      Fp         Ap     SCS
      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
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 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) =     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 Tc :
 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      Fp         Ap     SCS
```

```
     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"         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 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 Tc :
  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      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1      3220.80   40.25     4068.99    20120.00
     2       366.91   54.31      559.54    20360.00
```



```
  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
```

```
 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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             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 20454                     *
* 100-YR  HC ULTIMATE CONDITION    OCT 2013   DMALOTT                   *
 ************************************************************************

  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-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
          S-GRAPH TYPE                PERCENTAGE(DECIMAL)
        VALLEY(DEVELOPED)                   1.000
        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  20400.00 TO NODE  20401.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   924.07
  ELEVATION DATA: UPSTREAM(FEET) =   1720.00  DOWNSTREAM(FEET) =   1670.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.338
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.397
  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
  ".4 DWELLING/ACRE"         B        0.14      0.75     0.900    56   13.40
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       10.27      0.75     0.600    56   11.34
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.604
  SUBAREA RUNOFF(CFS) =     27.59
  TOTAL AREA(ACRES) =     10.41   PEAK FLOW RATE(CFS) =     27.59

  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  20401.00 TO NODE  20402.00 IS CODE =  63
------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
========================================================================
```

```
 UPSTREAM ELEVATION(FEET) = 1670.00  DOWNSTREAM ELEVATION(FEET) = 1657.00
 STREET LENGTH(FEET) =   293.15   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 18.00

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =      38.35
   ***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.) =    5.62
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.75
 STREET FLOW TRAVEL TIME(MIN.) =   0.87   Tc(MIN.) =   12.21
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.250
 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        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) =   21.51
 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) =      47.73

 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) = 0.52   HALFSTREET FLOOD WIDTH(FEET) =  18.81
 FLOW VELOCITY(FEET/SEC.) =  6.11   DEPTH*VELOCITY(FT*FT/SEC.) =   3.16
 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) =      51.04
   ***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.) =    3.80
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.45
 STREET FLOW TRAVEL TIME(MIN.) =   0.87   Tc(MIN.) =   13.08
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.118
 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        2.76      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) =    2.76      SUBAREA RUNOFF(CFS) =    6.63
 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) =      52.11

 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) = 0.65   HALFSTREET FLOOD WIDTH(FEET) =  25.46
 FLOW VELOCITY(FEET/SEC.) =  3.80   DEPTH*VELOCITY(FT*FT/SEC.) =   2.47
 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) =      61.52
   ***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.) =    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      Fp         Ap     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) =      67.07

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

 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
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 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        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) =   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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 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
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  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         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) =    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:
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  DEPTH(FEET) = 0.83   HALFSTREET FLOOD WIDTH(FEET) =  34.05
  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) =     137.75
    ***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     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) =   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<<<<<
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 >>>>>(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

 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) =     195.25
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.82
   HALFSTREET FLOOD WIDTH(FEET) =   33.75
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    8.66
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    7.11
 STREET FLOW TRAVEL TIME(MIN.) =   0.96   Tc(MIN.) =   22.30
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.264
 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       51.42      0.75     0.600    56
 COMMERCIAL                 B        4.09      0.75     0.100    56
 RESIDENTIAL
 ".4 DWELLING/ACRE"         B        0.43      0.75     0.900    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.566
 SUBAREA AREA(ACRES) =   55.94      SUBAREA RUNOFF(CFS) =   92.67
 EFFECTIVE AREA(ACRES) =    144.19    AREA-AVERAGED Fm(INCH/HR) =  0.44
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.59
 TOTAL AREA(ACRES) =      144.2        PEAK FLOW RATE(CFS) =     236.77

 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) = 0.87   HALFSTREET FLOOD WIDTH(FEET) =  36.13
 FLOW VELOCITY(FEET/SEC.) =  9.15   DEPTH*VELOCITY(FT*FT/SEC.) =   7.95

 *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) =  33.00    NUMBER OF PIPES =   1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) =  16.43
 PIPE-FLOW(CFS) =      97.67
 PIPEFLOW TRAVEL TIME(MIN.) =   0.51    Tc(MIN.) =  21.84
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.292
 SUBAREA AREA(ACRES) =   55.94      SUBAREA RUNOFF(CFS) =   94.09
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 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) =     280.23
   ***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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL FAIR COVER
 "OPEN BRUSH"               B        0.01      0.61     1.000    66
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B       52.45      0.75     0.600    56
 PUBLIC PARK                B        0.03      0.75     0.850    56
 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
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 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 Tc :
 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 <<<<<
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****************************************************************************
 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<<<<<
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 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         Ap      SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B       25.52      0.75      0.600    56
 PUBLIC PARK                B        5.30      0.75      0.850    56
 SCHOOL                     B        8.19      0.75      0.600    56
 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
```

```
  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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      311.41   23.37    2.201  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= 0.45;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
  CHANNEL FLOW THRU SUBAREA(CFS) =    3684.37
```



```
  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         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       25.77      0.75      0.600    56
  PUBLIC PARK                B        1.54      0.75      0.850    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.79      0.61      1.000    66
  COMMERCIAL                 B        0.05      0.75      0.100    56
  MOBILE HOME PARK           B        5.02      0.75      0.250    56
  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
```

```
  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 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
  "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      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           A        2.50      0.98     0.250    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        0.99      0.98     0.600    32
  COMMERCIAL                 A        2.87      0.98     0.100    32
  COMMERCIAL                 B        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
```



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  LONGEST FLOWPATH FROM NODE  20420.00 TO NODE  20422.00 =    1218.93 FEET.

****************************************************************************
  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      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           A        2.62      0.98     0.250    32
  SCHOOL                     A        0.15      0.98     0.600    32
  COMMERCIAL                 A        1.21      0.98     0.100    32
  COMMERCIAL                 B        2.01      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.63      0.75     0.600    56
  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<<<<<
```

```
  >>>>>(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) = 32.00

  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) =      61.67
    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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           A        0.47      0.98     0.250    32
  MOBILE HOME PARK           B        0.58      0.75     0.250    56
  COMMERCIAL                 B        2.83      0.75     0.100    56
  COMMERCIAL                 A        0.03      0.98     0.100    32
  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) =      66.20

  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
```



```
  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) =      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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        0.06      0.75     0.250    56
  COMMERCIAL                 B        1.63      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.63      0.75     0.600    56
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.17      0.75     0.600    56
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  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
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   2.78   Tc(MIN.) =   18.42
  SUBAREA AREA(ACRES) =    9.56       SUBAREA RUNOFF(CFS) =   18.63
  EFFECTIVE AREA(ACRES) =   40.94     AREA-AVERAGED Fm(INCH/HR) =   0.27
  AREA-AVERAGED Fp(INCH/HR) =   0.87  AREA-AVERAGED Ap =   0.31
  TOTAL AREA(ACRES) =       40.9         PEAK FLOW RATE(CFS) =      83.49

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50

  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.

****************************************************************************
  FLOW PROCESS FROM NODE  20426.00 TO NODE  20427.00 IS CODE =  92
----------------------------------------------------------------------------
  >>>>>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"       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 Ap =   0.34
  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
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  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.

****************************************************************************
  FLOW PROCESS FROM NODE  20472.00 TO NODE  20473.00 IS CODE =  92
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  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
  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
  "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

  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.

****************************************************************************
  FLOW PROCESS FROM NODE  20428.00 TO NODE  20429.00 IS CODE =  92
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =   1668.00
  DOWNSTREAM NODE ELEVATION(FEET) =   1664.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   362.53
  "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
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  MAXIMUM DEPTH(FEET) =   1.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.343
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  A        0.97      0.98      0.100    32
  RESIDENTIAL
  "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) =    125.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.14
  AVERAGE FLOW DEPTH(FEET) =   0.96   FLOOD WIDTH(FEET) =   74.77
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.18   Tc(MIN.) =   21.06
  SUBAREA AREA(ACRES) =   18.97       SUBAREA RUNOFF(CFS) =   31.53
  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) =     136.85

  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) =  0.98   FLOOD WIDTH(FEET) =   77.45
  FLOW VELOCITY(FEET/SEC.) =   5.24   DEPTH*VELOCITY(FT*FT/SEC) =   5.15
  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<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =     172.20
    ***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.) =    7.40
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.00
  STREET FLOW TRAVEL TIME(MIN.) =   3.07   Tc(MIN.) =   24.13
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  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.159
  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       21.36      0.98      0.600    32
  COMMERCIAL                  A        7.94      0.98      0.100    32
  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) =   70.66
  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) =     194.76

  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) = 0.85   HALFSTREET FLOOD WIDTH(FEET) =  35.28
  FLOW VELOCITY(FEET/SEC.) =  7.60   DEPTH*VELOCITY(FT*FT/SEC.) =   6.43

  *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
         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 **
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.78
  PIPE-FLOW(CFS) =      33.89
  PIPEFLOW TRAVEL TIME(MIN.) =   2.11    Tc(MIN.) =  23.17
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.213
  SUBAREA AREA(ACRES) =   44.19       SUBAREA RUNOFF(CFS) =   72.79
  TOTAL AREA(ACRES) =      121.3        PEAK FLOW RATE(CFS) =     200.59

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
  STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =  166.70
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.80
    HALFSTREET FLOOD WIDTH(FEET) =   33.15
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.34
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.89
  LONGEST FLOWPATH FROM NODE  20420.00 TO NODE  20430.00 =    5146.63 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
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INSIDE STREET CROSSFALL(DECIMAL) =  0.020
OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(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) =     209.04
  ***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      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
COMMERCIAL                 A        9.50      0.98     0.100    32
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) =   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
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  ***STREET FLOWING FULL***
  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 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
"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
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 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  10.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =      18.63
   ***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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 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
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 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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     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) =   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.

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 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
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  ***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      Fp         Ap     SCS
      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) =   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.

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 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) =      53.57
   ***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
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 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
      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) =   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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
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"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) =   27.83
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) =      76.61

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) = 1.03   HALFSTREET FLOOD WIDTH(FEET) =  44.50
FLOW VELOCITY(FEET/SEC.) =  1.90   DEPTH*VELOCITY(FT*FT/SEC.) =   1.96

*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 MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY(FEET/SEC.) =   3.43
PIPE-FLOW(CFS) =      32.99
PIPEFLOW TRAVEL TIME(MIN.) =   3.84    Tc(MIN.) =  28.28
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.963
SUBAREA AREA(ACRES) =   22.19      SUBAREA RUNOFF(CFS) =   30.24
TOTAL AREA(ACRES) =       61.1        PEAK FLOW RATE(CFS) =      83.26

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50
STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =   50.26
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.89
  HALFSTREET FLOOD WIDTH(FEET) =   37.67
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.73
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.54
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
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0180
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200
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 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) =   0.83

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     101.94
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.71
  HALFSTREET FLOOD WIDTH(FEET) =   28.38
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.42
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.58
 STREET FLOW TRAVEL TIME(MIN.) =   2.50   Tc(MIN.) =   30.78
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.866
 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        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                     B        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 AREA(ACRES) =   31.80      SUBAREA RUNOFF(CFS) =   37.34
 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) =     115.25

 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) = 0.74   HALFSTREET FLOOD WIDTH(FEET) =  29.54
 FLOW VELOCITY(FEET/SEC.) =  6.69   DEPTH*VELOCITY(FT*FT/SEC.) =   4.93
 ** 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.) =  11.71
 PIPE-FLOW(CFS) =      36.83
 PIPEFLOW TRAVEL TIME(MIN.) =   1.37    Tc(MIN.) =  29.65
 * 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

 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) =   81.97
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.68
   HALFSTREET FLOOD WIDTH(FEET) =   26.40
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.93
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.01
 LONGEST FLOWPATH FROM NODE  20440.00 TO NODE  20447.00 =    4131.92 FEET.

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 FLOW PROCESS FROM NODE  20447.00 TO NODE  20448.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
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 >>>>>(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) = 26.00

 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A        9.63      0.98     0.600    32
 COMMERCIAL                 A       12.07      0.98     0.100    32
 COMMERCIAL                 B        0.31      0.75     0.100    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        2.23      0.75     0.600    56
 SCHOOL                     B       11.63      0.75     0.600    56
 SCHOOL                     A        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
 TOTAL AREA(ACRES) =      130.7        PEAK FLOW RATE(CFS) =     165.65
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 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) =     184.63
   ***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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 A        3.48      0.98     0.100    32
 COMMERCIAL                 B        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                     A        0.64      0.98     0.600    32
 SCHOOL                     B       16.30      0.75     0.600    56
 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
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  TOTAL AREA(ACRES) =      159.4        PEAK FLOW RATE(CFS) =     195.83

  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) = 0.89   HALFSTREET FLOOD WIDTH(FEET) =  36.92
  FLOW VELOCITY(FEET/SEC.) =  7.24   DEPTH*VELOCITY(FT*FT/SEC.) =   6.41

  *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
         THE MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.88
  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.) =  12.02
  PIPE-FLOW(CFS) =      59.04
  PIPEFLOW TRAVEL TIME(MIN.) =   1.14    Tc(MIN.) =  31.99
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.823
  SUBAREA AREA(ACRES) =   28.67      SUBAREA RUNOFF(CFS) =   38.64
  TOTAL AREA(ACRES) =      159.4        PEAK FLOW RATE(CFS) =     199.58

  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) =  140.53
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.80
    HALFSTREET FLOOD WIDTH(FEET) =   32.83
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.59
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.29
  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.) =   31.99
  RAINFALL INTENSITY(INCH/HR) =   1.82
  AREA-AVERAGED Fm(INCH/HR) =  0.43
  AREA-AVERAGED Fp(INCH/HR) =  0.81
  AREA-AVERAGED Ap =  0.53
  EFFECTIVE STREAM AREA(ACRES) =     159.38
  TOTAL STREAM AREA(ACRES) =     159.38
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     199.58

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      200.59   26.83    2.026  0.94( 0.36) 0.38     132.2   20420.00
      2      199.58   31.99    1.823  0.81( 0.43) 0.53     159.4   20440.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
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  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      392.39   26.83    2.026  0.87( 0.39) 0.45     265.9   20420.00
      2      375.80   31.99    1.823  0.86( 0.40) 0.46     291.6   20440.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     392.39    Tc(MIN.) =    26.83
  EFFECTIVE AREA(ACRES) =     265.88   AREA-AVERAGED Fm(INCH/HR) =  0.39
  AREA-AVERAGED Fp(INCH/HR) =  0.87  AREA-AVERAGED Ap =  0.45
  TOTAL AREA(ACRES) =      291.6
  LONGEST FLOWPATH FROM NODE  20420.00 TO NODE  20449.00 =    6496.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20449.00 TO NODE  20450.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 18 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1625.00  DOWNSTREAM ELEVATION(FEET) = 1595.00
  STREET LENGTH(FEET) =  1304.02   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) =   0.89

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     468.91
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  1.18
    HALFSTREET FLOOD WIDTH(FEET) =   51.51
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    8.87
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   10.44
  STREET FLOW TRAVEL TIME(MIN.) =   2.45   Tc(MIN.) =   29.28
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.922
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       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
  COMMERCIAL                 B       19.61      0.75      0.100    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        9.23      0.63      1.000    65
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        8.18      0.75      0.600    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        7.04      0.98      0.600    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.77
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.292
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  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
      1      535.94   28.00    1.975  0.85( 0.35) 0.41     366.1   20420.00
      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
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  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       19.78      0.75     0.600    56
  COMMERCIAL                 B        5.95      0.75     0.100    56
  MOBILE HOME PARK           B        6.72      0.75     0.250    56
  PUBLIC PARK                B        6.76      0.75     0.850    56
  SCHOOL                     B        5.51      0.75     0.600    56
  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
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        6.50      0.75      0.600    56
  COMMERCIAL                 B        3.31      0.75      0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        0.25      0.98      0.600    32
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.07      0.61      1.000    66
  PUBLIC PARK                B        0.12      0.75      0.850    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.444
  SUBAREA AREA(ACRES) =   10.25      SUBAREA RUNOFF(CFS) =   12.86
  EFFECTIVE AREA(ACRES) =    421.03   AREA-AVERAGED Fm(INCH/HR) =  0.38
  AREA-AVERAGED Fp(INCH/HR) =  0.83  AREA-AVERAGED Ap =  0.45
  TOTAL AREA(ACRES) =      446.7       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 = 5.50

****************************************************************************
  FLOW PROCESS FROM NODE  20452.00 TO NODE  20452.00 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      535.94   34.95    1.729  0.83( 0.35) 0.42     421.0   20420.00
      2      506.39   40.27    1.588  0.83( 0.36) 0.43     446.7   20440.00
  LONGEST FLOWPATH FROM NODE  20420.00 TO NODE  20452.00 =   11995.85 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  PEAK FLOW RATE(CFS) =     3684.37    Tc(MIN.) =   42.44
  AREA-AVERAGED Fm(INCH/HR) =  0.58    Ybar = 0.54
  TOTAL AREA(ACRES) =     4897.4
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  20452.00 =   27096.44 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= 6.80
  S-GRAPH: VALLEY(DEV.)= 62.3%;VALLEY(UNDEV.)/DESERT= 37.7%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.71; LAG(HR) = 0.57; Fm(INCH/HR) = 0.56; 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= 0.99
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =     5344.1
  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) =    1482.58
  PEAK FLOW RATE(CFS) =    4010.20

****************************************************************************
  FLOW PROCESS FROM NODE  20452.00 TO NODE  20452.00 IS CODE =  12
----------------------------------------------------------------------------
```



```
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  20452.00 TO NODE  20453.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1510.00  DOWNSTREAM(FEET) =   1440.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3395.49   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) =    4010.20
  FLOW VELOCITY(FEET/SEC.) =  32.31   FLOW DEPTH(FEET) =   5.43
  TRAVEL TIME(MIN.) =   1.75   Tc(MIN.) =   44.19
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  20453.00 =   30491.93 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20453.00 TO NODE  20453.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   44.19
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.502
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B       20.13      0.75      0.250    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       19.32      0.75      0.600    56
  SCHOOL                     B        8.94      0.75      0.600    56
  COMMERCIAL                 B        4.10      0.75      0.100    56
  PUBLIC PARK                B        1.64      0.75      0.850    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        0.19      0.98      0.600    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.440
  SUBAREA AREA(ACRES) =   54.32
  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.)= 62.7%;VALLEY(UNDEV.)/DESERT= 37.3%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.74; LAG(HR) = 0.59; Fm(INCH/HR) = 0.56; Ybar = 0.53
  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= 0.99
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =     5398.4
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  20453.00 =   30491.93 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0302; Lca/L=0.4,n=.0270; Lca/L=0.5,n=.0248;Lca/L=0.6,n=.0232
  TIME OF PEAK FLOW(HR) = 16.58  RUNOFF VOLUME(AF) =    1498.95
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    3895.96
  TOTAL AREA(ACRES) =     5398.4       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  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.) =   46.04
  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.) =   46.04
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.465
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  SCHOOL                     B       17.44      0.75     0.600    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        3.70      0.75     0.600    56
  PUBLIC PARK                B        9.17      0.75     0.850    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        5.37      0.75     0.500    56
  COMMERCIAL                 B        1.64      0.75     0.100    56
  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= 0.99
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =     5435.8
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  20454.00 =   33620.61 FEET.
   EQUIVALENT 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) =    4010.20
  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  20454.00 TO NODE  20454.00 IS CODE = 152
```



```
----------------------------------------------------------------------------
  >>>>>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
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             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 20539                     *
* 100-YR  HC ULTIMATE CONDITION    OCT 2013   DMALOTT                   *
 ************************************************************************

  FILE NAME: LR0205ZZ.DAT
  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  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
          S-GRAPH TYPE                PERCENTAGE(DECIMAL)
        VALLEY(DEVELOPED)                   1.000
        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)]**0.20
  SUBAREA 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      Fp         Ap      SCS   Tc
       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
  "ORCHARDS"                 A        0.12      0.88      1.000    44   26.60
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.80
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.612
  SUBAREA RUNOFF(CFS) =      8.25
  TOTAL AREA(ACRES) =      3.95   PEAK FLOW RATE(CFS) =      8.25

  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
------------------------------------------------------------------------
  >>>>>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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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"                 A        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) =      15.34

  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
----------------------------------------------------------------------------
  >>>>>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
  STREET HALFWIDTH(FEET) = 18.00

  DISTANCE FROM CROWN 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) =   0.86

    **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) =  0.49
    HALFSTREET 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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.45      0.75     0.600    56
  MOBILE HOME PARK           B        1.73      0.75     0.250    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        0.21      0.98     0.600    32
  MOBILE HOME PARK           A        0.20      0.98     0.250    32
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 A        0.11      0.88     1.000    44
  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 =  0.56
  TOTAL 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

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.49   HALFSTREET FLOOD WIDTH(FEET) =  18.00
  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.

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  FLOW PROCESS FROM NODE  20503.00 TO NODE  20504.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
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  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1580.00  DOWNSTREAM ELEVATION(FEET) = 1570.00
  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
  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) =   0.86

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      30.36
    ***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.) =    4.26
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.12
  STREET FLOW TRAVEL TIME(MIN.) =   1.63   Tc(MIN.) =   19.71
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.437
  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        0.28      0.75     0.600    56
  MOBILE HOME PARK           B        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) =   12.91
  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) =      35.36

  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) = 0.52   HALFSTREET FLOOD WIDTH(FEET) =  18.81
  FLOW VELOCITY(FEET/SEC.) =  4.53   DEPTH*VELOCITY(FT*FT/SEC.) =   2.34
  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
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  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) =      40.58
    ***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      Fp         Ap     SCS
       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
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  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      58.02
  ***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      Fp         Ap     SCS
      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.

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 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:
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  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      Fp         Ap     SCS
      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    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) =   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
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  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "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) =   20.86
  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      Fp         Ap     SCS
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       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) =    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
  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

  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
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SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow 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) =      94.89
  ***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      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
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
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    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.51
  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 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
  "3-4 DWELLINGS/ACRE"       A        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"       B        0.57      0.75     0.600    56   13.43
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        1.82      0.63     1.000    65   23.01
  COMMERCIAL                 B        0.06      0.75     0.100    56    9.91
  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
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  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) =      15.92
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.41
    HALFSTREET FLOOD WIDTH(FEET) =   12.73
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.40
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.82
  STREET FLOW TRAVEL TIME(MIN.) =   0.94   Tc(MIN.) =   10.85
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.487
  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        1.59      0.88     1.000    44
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        2.00      0.63     1.000    65
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.46      0.75     0.600    56
  MOBILE HOME PARK           B        0.58      0.75     0.250    56
  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) =   11.85
  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) =      21.20

  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) = 0.45   HALFSTREET FLOOD WIDTH(FEET) =  14.37
  FLOW VELOCITY(FEET/SEC.) =  4.70   DEPTH*VELOCITY(FT*FT/SEC.) =   2.10
  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
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  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      30.33
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.56
    HALFSTREET FLOOD WIDTH(FEET) =   19.94
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.64
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.03
  STREET FLOW TRAVEL TIME(MIN.) =   1.40   Tc(MIN.) =   12.26
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.242
  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        1.37      0.88     1.000    44
  MOBILE HOME PARK           A        1.25      0.98     0.250    32
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        1.07      0.63     1.000    65
  MOBILE HOME PARK           B        2.91      0.75     0.250    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.58      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.78
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.533
  SUBAREA AREA(ACRES) =    7.18      SUBAREA RUNOFF(CFS) =   18.26
  EFFECTIVE AREA(ACRES) =     15.48    AREA-AVERAGED Fm(INCH/HR) =  0.54
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.72
  TOTAL AREA(ACRES) =       15.5        PEAK FLOW RATE(CFS) =      37.63

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.59   HALFSTREET FLOOD WIDTH(FEET) =  21.69
  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.

****************************************************************************
  FLOW PROCESS FROM NODE  20513.00 TO NODE  20514.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 18 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1575.00  DOWNSTREAM ELEVATION(FEET) = 1570.00
  STREET LENGTH(FEET) =   416.53   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
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  Manning's FRICTION FACTOR for Streetflow 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) =      51.26
    ***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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           A        3.78      0.98     0.250    32
  MOBILE HOME PARK           B        6.42      0.75     0.250    56
  RESIDENTIAL
  "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:
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    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        5.83      0.75     0.250    56
  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):
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 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
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.

****************************************************************************
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

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) =     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
```



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"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

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) =  37.84
FLOW VELOCITY(FEET/SEC.) =  6.33   DEPTH*VELOCITY(FT*FT/SEC.) =   5.72
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 1115.0 FT WITH ELEVATION-DROP =  20.0 FT, IS   71.2 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE  20517.00
LONGEST FLOWPATH FROM NODE  20510.00 TO NODE  20517.00 =    4267.33 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  20517.00 TO NODE  20518.00 IS CODE =  63
----------------------------------------------------------------------------
>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STREET TABLE SECTION # 18 USED)<<<<<
============================================================================
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

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(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:
  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
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  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.600
  SUBAREA AREA(ACRES) =   41.95      SUBAREA RUNOFF(CFS) =   57.52
  EFFECTIVE AREA(ACRES) =    148.93    AREA-AVERAGED Fm(INCH/HR) =  0.47
  AREA-AVERAGED Fp(INCH/HR) =  0.86  AREA-AVERAGED Ap =  0.55
  TOTAL AREA(ACRES) =      148.9        PEAK FLOW RATE(CFS) =     218.09

  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) = 0.98   HALFSTREET FLOOD WIDTH(FEET) =  41.74
  FLOW VELOCITY(FEET/SEC.) =  6.30   DEPTH*VELOCITY(FT*FT/SEC.) =   6.18
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1340.0 FT WITH ELEVATION-DROP =  20.5 FT, IS   79.2 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE  20518.00
  LONGEST FLOWPATH FROM NODE  20510.00 TO NODE  20518.00 =    5607.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20518.00 TO NODE  20518.00 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.) =   25.37
  RAINFALL INTENSITY(INCH/HR) =   2.10
  AREA-AVERAGED Fm(INCH/HR) =  0.47
  AREA-AVERAGED Fp(INCH/HR) =  0.86
  AREA-AVERAGED Ap =  0.55
  EFFECTIVE STREAM AREA(ACRES) =     148.93
  TOTAL STREAM AREA(ACRES) =     148.93
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     218.09

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       93.84   40.16    1.591  0.83( 0.47) 0.56      82.8   20500.00
      2      218.09   25.37    2.095  0.86( 0.47) 0.55     148.9   20510.00

  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      303.97   25.37    2.095  0.85( 0.47) 0.55     201.2   20510.00
      2      244.30   40.16    1.591  0.85( 0.47) 0.55     231.7   20500.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     303.97    Tc(MIN.) =    25.37
  EFFECTIVE AREA(ACRES) =     201.23   AREA-AVERAGED Fm(INCH/HR) =  0.47
  AREA-AVERAGED Fp(INCH/HR) =  0.85  AREA-AVERAGED Ap =  0.55
  TOTAL AREA(ACRES) =      231.7
  LONGEST FLOWPATH FROM NODE  20500.00 TO NODE  20518.00 =    7021.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20518.00 TO NODE  20519.00 IS CODE =  33
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----------------------------------------------------------------------------
  >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1489.50
  DOWNSTREAM NODE ELEVATION(FEET) =  1440.00
  FLOW LENGTH(FEET) =  2632.61   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  42.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  20.42
  PIPE-FLOW(CFS) =     303.97
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   2.31    Tc(MIN.) =  27.68
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.989
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  SCHOOL                     A       21.65      0.98     0.600    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A       27.03      0.98     0.600    32
  MOBILE HOME PARK           A        8.46      0.98     0.250    32
  SCHOOL                     B        7.51      0.75     0.600    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        5.29      0.75     0.600    56
  MOBILE HOME PARK           B        2.31      0.75     0.250    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.93
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.548
  SUBAREA AREA(ACRES) =   72.25      SUBAREA RUNOFF(CFS) =   96.26
  EFFECTIVE AREA(ACRES) =    273.48    AREA-AVERAGED Fm(INCH/HR) =  0.48
  AREA-AVERAGED Fp(INCH/HR) =  0.87  AREA-AVERAGED Ap =  0.55
  TOTAL AREA(ACRES) =      304.0        PEAK FLOW RATE(CFS) =     371.74

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

  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) =   67.77
    ***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.) =    4.71
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.24

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
```

```
     1      371.74   27.68    1.989  0.87( 0.48) 0.55     273.5   20510.00
     2      289.81   42.55    1.536  0.87( 0.48) 0.55     304.0   20500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     371.74  Tc(MIN.) =   27.68
  AREA-AVERAGED Fm(INCH/HR) =  0.48  AREA-AVERAGED Fp(INCH/HR) =  0.87
  AREA-AVERAGED Ap =  0.55  EFFECTIVE AREA(ACRES) =     273.48
  LONGEST FLOWPATH FROM NODE  20500.00 TO NODE  20519.00 =    9653.93 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20519.00 TO NODE  20520.00 IS CODE =  33
----------------------------------------------------------------------------
  >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1440.00
  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
  DEPTH OF FLOW IN  66.0 INCH PIPE IS  44.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.81
  PIPE-FLOW(CFS) =     371.74
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   1.27    Tc(MIN.) =  28.95
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.936
  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       13.85      0.98     0.600    32
  SCHOOL                     A       16.29      0.98     0.600    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       15.89      0.75     0.600    56
  PUBLIC PARK                B        9.87      0.75     0.850    56
  SCHOOL                     B       12.11      0.75     0.600    56
  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) =   85.66
  EFFECTIVE AREA(ACRES) =    341.49    AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.86  AREA-AVERAGED Ap =  0.57
  TOTAL AREA(ACRES) =      372.0        PEAK FLOW RATE(CFS) =     444.41

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

  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) =   72.67
    ***STREET FLOWING FULL***
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    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.70
    HALFSTREET FLOOD WIDTH(FEET) =   27.52
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.87
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.39

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      444.41   28.95    1.936  0.86( 0.49) 0.57     341.5   20510.00
      2      341.60   43.88    1.508  0.86( 0.49) 0.57     372.0   20500.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     444.41  Tc(MIN.) =   28.95
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.86
  AREA-AVERAGED Ap =  0.57  EFFECTIVE AREA(ACRES) =     341.49
  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<<<<<
  >>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  52.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  20.26
  PIPE-FLOW(CFS) =     444.41
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   0.92    Tc(MIN.) =  29.87
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.900
  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        3.22      0.98     0.600    32
  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) =    6.89
  EFFECTIVE AREA(ACRES) =    347.07    AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.86  AREA-AVERAGED Ap =  0.57
  TOTAL AREA(ACRES) =      377.5        PEAK FLOW RATE(CFS) =     444.41
  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

  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
```

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  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.) =   29.87
  RAINFALL INTENSITY(INCH/HR) =   1.90
  AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.86
  AREA-AVERAGED Ap =  0.57
  EFFECTIVE STREAM AREA(ACRES) =     347.07
  TOTAL STREAM AREA(ACRES) =     377.54
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     444.41

****************************************************************************
  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
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.925
  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
  "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) =     11.22
  TOTAL AREA(ACRES) =      5.33   PEAK FLOW RATE(CFS) =     11.22

  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  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
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  STREET HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      29.29
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.58
    HALFSTREET FLOOD WIDTH(FEET) =   22.22
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.76
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.61
  STREET FLOW TRAVEL TIME(MIN.) =   4.66   Tc(MIN.) =   19.21
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.476
  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       21.08      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) =   21.08      SUBAREA RUNOFF(CFS) =   35.88
  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) =      44.95

  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) = 0.66   HALFSTREET FLOOD WIDTH(FEET) =  26.19
  FLOW VELOCITY(FEET/SEC.) =  3.11   DEPTH*VELOCITY(FT*FT/SEC.) =   2.06
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  771.1 FT WITH ELEVATION-DROP =   5.0 FT, IS   41.1 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  23.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.89
  PIPE-FLOW(CFS) =      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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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      Fp         Ap     SCS
```



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       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) =   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
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  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     121.80
  ***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      Fp         Ap     SCS
      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
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  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      Fp         Ap     SCS
       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) =   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
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 AREA-AVERAGED Ap =  0.60
 EFFECTIVE STREAM AREA(ACRES) =     115.45
 TOTAL STREAM AREA(ACRES) =     115.45
 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
     1      341.60   44.84    1.489  0.86( 0.49) 0.57     377.5   20500.00
     2      136.76   31.69    1.833  0.97( 0.58) 0.60     115.4   20530.00

 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      580.15   29.87    1.900  0.89( 0.51) 0.57     455.9   20510.00
     2      568.66   31.69    1.833  0.89( 0.51) 0.58     466.2   20530.00
     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)<<
============================================================================
 UPSTREAM NODE ELEVATION(FEET) =  1395.00
 DOWNSTREAM NODE ELEVATION(FEET) =  1394.50
 FLOW LENGTH(FEET) =   877.02   MANNING'S N =  0.013

 USER 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.) =   6.43
 PIPE-FLOW(CFS) =     580.15
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME(MIN.) =   2.45    Tc(MIN.) =  32.32
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.812
 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       13.40      0.75     0.600    56
 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) =   26.92
 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
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 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

 *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(CFS) =     580.15
 BOX-FLOW TRAVEL TIME(MIN.) =   0.91    Tc(MIN.) =   33.22
 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.) =   33.22
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.782
 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        6.57      0.75     0.500    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        9.02      0.75     0.600    56
 COMMERCIAL                 B        6.87      0.75     0.100    56
 PUBLIC PARK                B        0.38      0.75     0.850    56
 SCHOOL                     B        0.45      0.75     0.600    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.428
 SUBAREA AREA(ACRES) =   23.29      SUBAREA RUNOFF(CFS) =   30.64
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.02      0.75     0.600    56
  COMMERCIAL                 B        3.73      0.75     0.100    56
  PUBLIC PARK                B        1.42      0.75     0.850    56
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK                B        2.13      0.75     0.850    56
  SCHOOL                     B        8.75      0.75     0.600    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        3.67      0.75     0.600    56
  COMMERCIAL                 B        0.11      0.75     0.100    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.07      0.75     0.500    56
```

```
  MOBILE HOME PARK           B        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= 0.45;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       Q      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
      3      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
```



```
  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)
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             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 20658                      *
* 100-YR  HC ULTIMATE CONDITION    OCT 2013   DMALOTT                    *
 ************************************************************************

  FILE NAME: LR0206ZZ.DAT
  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  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  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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.086
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.161
  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
  "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
  "OPEN BRUSH"               B        0.30      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) =     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) =      20.05
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        0.68      0.75     0.700    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.18      0.75     0.500    56
  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      Fp         Ap     SCS
       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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        1.97      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.08      0.75     0.600    56
  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
```

```
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        2.05      0.75     0.700    56
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        3.11      0.75     0.700    56
```



```
  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 =  0.693
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        0.41      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 =  0.659
  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)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   2092.00  DOWNSTREAM(FEET) =   2080.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   203.75   CHANNEL SLOPE =  0.0589
  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.) =   4.23   FLOW DEPTH(FEET) =   0.77
  TRAVEL TIME(MIN.) =   0.80   Tc(MIN.) =   14.82
  LONGEST FLOWPATH FROM NODE  20600.00 TO NODE  20608.00 =    2246.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20608.00 TO NODE  20608.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   14.82
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.892
  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        2.94      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.31      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.656
  SUBAREA AREA(ACRES) =    5.25      SUBAREA RUNOFF(CFS) =   11.35
  EFFECTIVE AREA(ACRES) =     22.16   AREA-AVERAGED Fm(INCH/HR) =  0.51
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.69
  TOTAL AREA(ACRES) =       22.2       PEAK FLOW RATE(CFS) =      47.48

  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  20608.00 TO NODE  20609.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2080.00  DOWNSTREAM(FEET) =   2065.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   358.70   CHANNEL SLOPE =  0.0418
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  15.000
  MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   1.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      47.48
  FLOW VELOCITY(FEET/SEC.) =   3.95   FLOW DEPTH(FEET) =   0.90
  TRAVEL TIME(MIN.) =   1.51   Tc(MIN.) =   16.34
  LONGEST FLOWPATH FROM NODE  20600.00 TO NODE  20609.00 =    2604.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20609.00 TO NODE  20609.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   16.34
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.728
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
  COMMERCIAL                 B        5.77      0.75     0.100    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        7.52      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.91      0.75     0.600    56
  MOBILE HOME PARK           B        1.23      0.75     0.250    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.92      0.75     0.900    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.460
  SUBAREA AREA(ACRES) =   16.35      SUBAREA RUNOFF(CFS) =   35.08
  EFFECTIVE AREA(ACRES) =     38.51   AREA-AVERAGED Fm(INCH/HR) =  0.44
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.59
  TOTAL AREA(ACRES) =       38.5       PEAK FLOW RATE(CFS) =      79.29

  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  20609.00 TO NODE  20610.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2065.00  DOWNSTREAM ELEVATION(FEET) = 2060.00
  STREET LENGTH(FEET) =   360.92   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) =      85.14
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.72
    HALFSTREET FLOOD WIDTH(FEET) =   28.94
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.87
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.50
  STREET FLOW TRAVEL TIME(MIN.) =   1.23   Tc(MIN.) =   17.57
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.612
  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        1.29      0.75     0.500    56
  COMMERCIAL                 B        2.79      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.24      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        0.95      0.75     0.700    56
  MOBILE HOME PARK           B        0.22      0.75     0.250    56
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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.30      0.75     0.500    56
  COMMERCIAL                 B        1.71      0.75     0.100    56
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        1.66      0.75     0.400    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.04      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       12.96      0.75     0.700    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.604
```



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  SUBAREA AREA(ACRES) =   17.67      SUBAREA RUNOFF(CFS) =   32.50
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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"         B       37.07      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        6.98      0.75     0.600    56
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        0.01      0.75     0.400    56
  NATURAL FAIR COVER
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"OPEN BRUSH"                B        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) =   79.87
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) =     188.57

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) = 1.03   HALFSTREET FLOOD WIDTH(FEET) =  44.62
FLOW VELOCITY(FEET/SEC.) =  4.65   DEPTH*VELOCITY(FT*FT/SEC.) =   4.80

*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) =  30.00    NUMBER OF PIPES =   1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY(FEET/SEC.) =  17.38
PIPE-FLOW(CFS) =      85.38
PIPEFLOW TRAVEL TIME(MIN.) =   0.38    Tc(MIN.) =  19.34
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.466
SUBAREA AREA(ACRES) =   46.90      SUBAREA RUNOFF(CFS) =   83.30
TOTAL AREA(ACRES) =      108.6        PEAK FLOW RATE(CFS) =     196.51

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) =  111.13
  ***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.) =    4.12
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.56
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L =   398.3 FT WITH ELEVATION-DROP =   3.0 FT, IS  145.4 CFS,
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE  20612.00
LONGEST FLOWPATH FROM NODE  20600.00 TO NODE  20612.00 =    3716.33 FEET.

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FLOW PROCESS FROM NODE  20612.00 TO NODE  20613.00 IS CODE =  63
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>>>>>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
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STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(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) =     200.62
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.99
  HALFSTREET FLOOD WIDTH(FEET) =   42.49
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.45
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.39
STREET FLOW TRAVEL TIME(MIN.) =   1.12   Tc(MIN.) =   20.46
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.384
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        0.53      0.75     0.500    56
COMMERCIAL                 B        2.00      0.75     0.100    56
RESIDENTIAL
"2 DWELLINGS/ACRE"         B        1.58      0.75     0.700    56
RESIDENTIAL
"3-4 DWELLINGS/ACRE"       B        0.26      0.75     0.600    56
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) =    8.21
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) =     196.71

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) = 0.98   HALFSTREET FLOOD WIDTH(FEET) =  42.18
FLOW VELOCITY(FEET/SEC.) =  5.42   DEPTH*VELOCITY(FT*FT/SEC.) =   5.33

*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) =  30.00    NUMBER OF PIPES =   1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY(FEET/SEC.) =  20.92
PIPE-FLOW(CFS) =     102.79
PIPEFLOW TRAVEL TIME(MIN.) =   0.29    Tc(MIN.) =  19.63
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.444
SUBAREA AREA(ACRES) =    4.37      SUBAREA RUNOFF(CFS) =    8.45
TOTAL AREA(ACRES) =      112.9        PEAK FLOW RATE(CFS) =     202.80

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) =  100.02
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.79
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    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.

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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.63      0.75     0.500    56
  COMMERCIAL                 B        2.36      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.24      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        2.47      0.75     0.700    56
  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
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  *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 Tc :
  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.

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  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) =     215.93
    ***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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
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  "5-7 DWELLINGS/ACRE"       B        0.61      0.75     0.500    56
  COMMERCIAL                 B        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    56
  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) =    9.90
  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) =     213.10

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 1.04   HALFSTREET FLOOD WIDTH(FEET) =  44.99
  FLOW VELOCITY(FEET/SEC.) =  5.17   DEPTH*VELOCITY(FT*FT/SEC.) =   5.38

  *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.) =  20.51
  PIPE-FLOW(CFS) =     121.93
  PIPEFLOW TRAVEL TIME(MIN.) =   0.26    Tc(MIN.) =  20.24
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.399
  SUBAREA AREA(ACRES) =    5.51      SUBAREA RUNOFF(CFS) =   10.17
  TOTAL AREA(ACRES) =      124.1        PEAK FLOW RATE(CFS) =     219.12

  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) =   97.19
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.80
    HALFSTREET FLOOD WIDTH(FEET) =   32.97
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.33
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.46
  LONGEST FLOWPATH FROM NODE  20600.00 TO NODE  20615.00 =    4797.09 FEET.

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  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
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SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(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) =     229.55
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  1.14
  HALFSTREET FLOOD WIDTH(FEET) =   50.06
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.51
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.15
STREET FLOW TRAVEL TIME(MIN.) =   1.18   Tc(MIN.) =   21.42
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.319
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        2.51      0.75     0.500    56
COMMERCIAL                 B        0.24      0.75     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) =   20.86
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) =     231.01

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) = 1.14   HALFSTREET FLOOD WIDTH(FEET) =  50.24
FLOW VELOCITY(FEET/SEC.) =  4.51   DEPTH*VELOCITY(FT*FT/SEC.) =   5.16

*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.) =  17.87
PIPE-FLOW(CFS) =     126.46
PIPEFLOW TRAVEL TIME(MIN.) =   0.30    Tc(MIN.) =  20.54
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.378
SUBAREA AREA(ACRES) =   12.55      SUBAREA RUNOFF(CFS) =   21.53
TOTAL AREA(ACRES) =      136.7        PEAK FLOW RATE(CFS) =     238.31

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) =  111.85
  ***STREET FLOWING FULL***
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    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        2.43      0.75     0.500    56
  COMMERCIAL                 B        2.02      0.75     0.100    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        3.04      0.75     0.700    56
  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 AREA(ACRES) =    7.76      SUBAREA RUNOFF(CFS) =   13.65
  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
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  FLOW VELOCITY(FEET/SEC.) =  8.67   DEPTH*VELOCITY(FT*FT/SEC.) =   7.63

  *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 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       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) =     29.39
  TOTAL AREA(ACRES) =     12.24   PEAK FLOW RATE(CFS) =     29.39

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
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```
  5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.53

****************************************************************************
  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) =      29.39
  FLOW VELOCITY(FEET/SEC.) =   2.46   FLOW DEPTH(FEET) =   0.58
  TRAVEL TIME(MIN.) =   2.42   Tc(MIN.) =   14.50
  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.) =   14.50
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.931
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        3.73      0.61     1.000    66
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        1.57      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.62      0.75     0.600    56
  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) =   14.80
  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) =      40.45

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50

****************************************************************************
  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) =      40.45
  FLOW VELOCITY(FEET/SEC.) =   2.77   FLOW DEPTH(FEET) =   0.65
  TRAVEL TIME(MIN.) =   0.95   Tc(MIN.) =   15.45
  LONGEST FLOWPATH FROM NODE  20620.00 TO NODE  20623.00 =    1381.29 FEET.
```



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****************************************************************************
  FLOW PROCESS FROM NODE  20623.00 TO NODE  20623.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   15.45
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.821
  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        3.20      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.56      0.61     1.000    66
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        1.58      0.75     0.400    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.74      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) =  0.73
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.631
  SUBAREA AREA(ACRES) =    8.16      SUBAREA RUNOFF(CFS) =   17.32
  EFFECTIVE AREA(ACRES) =     27.32   AREA-AVERAGED Fm(INCH/HR) =  0.55
  AREA-AVERAGED Fp(INCH/HR) =  0.66  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =       27.3       PEAK FLOW RATE(CFS) =      55.88

  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  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) =      55.88
  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  20624.00 TO NODE  20624.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   17.12
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.653
  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        4.38      0.75     0.400    56
  RESIDENTIAL
```

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  "3-4 DWELLINGS/ACRE"       B        5.30      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        1.08      0.75     0.900    56
  CONDOMINIUMS               B        0.14      0.75     0.350    56
  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) =   22.02
  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
----------------------------------------------------------------------------
  >>>>>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
  LONGEST FLOWPATH FROM NODE  20620.00 TO NODE  20625.00 =    1964.97 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20625.00 TO NODE  20625.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   18.88
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.502
  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        5.47      0.75     0.600    56
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        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)<<<<<
```



```
============================================================================
  UPSTREAM ELEVATION(FEET) = 2130.00  DOWNSTREAM ELEVATION(FEET) = 2116.00
  STREET LENGTH(FEET) =   342.35   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) =   0.74

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      83.54
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.61
    HALFSTREET 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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        0.09      0.75     0.400    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.68      0.75     0.600    56
  MOBILE HOME PARK           B        0.24      0.75     0.250    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.04      0.75     0.900    56
  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
  STREET HALFWIDTH(FEET) = 18.00
```

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =      89.15
   ***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      Fp         Ap     SCS
      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"         B        1.53      0.75     0.900    56
 MOBILE HOME PARK           B        0.07      0.75     0.250    56
 COMMERCIAL                 B        0.09      0.75     0.100    56
 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) =      88.21

 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.

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 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
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 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 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"       B        1.65      0.75     0.600    56
 COMMERCIAL                 B        0.68      0.75     0.100    56
 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
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 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =      94.05
   ***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.) =    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) =  2.143
 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        0.98      0.75     0.400    56
 RESIDENTIAL
 ".4 DWELLING/ACRE"         B        0.92      0.75     0.900    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        3.13      0.75     0.600    56
 COMMERCIAL                 B        0.27      0.75     0.100    56
 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) =      95.94

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50

 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.

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 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
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 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):
  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
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"      B        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
 COMMERCIAL                 B        1.62      0.75     0.100    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.

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 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
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 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) =  0.72
   HALFSTREET 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      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
 ".4 DWELLING/ACRE"         B        0.22      0.75     0.900    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        2.91      0.75     0.600    56
 COMMERCIAL                 B        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.

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 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
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 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) =  0.72
   HALFSTREET 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):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"      B        0.65      0.75     0.400    56
 CONDOMINIUMS               B        1.64      0.75     0.350    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        3.35      0.75     0.600    56
 COMMERCIAL                 B        1.11      0.75     0.100    56
 RESIDENTIAL
 ".4 DWELLING/ACRE"         B        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) =   10.53
 EFFECTIVE AREA(ACRES) =     88.94    AREA-AVERAGED Fm(INCH/HR) =  0.44
 AREA-AVERAGED Fp(INCH/HR) =  0.71  AREA-AVERAGED Ap =  0.63
 TOTAL 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
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  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     146.01
  ***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.) =    6.84
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.35
 STREET FLOW TRAVEL TIME(MIN.) =   0.62   Tc(MIN.) =   27.39
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.001
 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        4.07      0.75     0.400    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        3.86      0.75     0.600    56
 RESIDENTIAL
 ".4 DWELLING/ACRE"         B       20.53      0.75     0.900    56
 COMMERCIAL                 B        1.08      0.75     0.100    56
 MOBILE HOME PARK           B        0.18      0.75     0.250    56
 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) =   38.33
 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) =     162.97

 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.) =  7.00   DEPTH*VELOCITY(FT*FT/SEC.) =   5.68
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  252.3 FT WITH ELEVATION-DROP =   6.0 FT, IS  119.7 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
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  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     163.51
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.71
  HALFSTREET FLOOD WIDTH(FEET) =   28.27
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    9.78
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.90
 STREET FLOW TRAVEL TIME(MIN.) =   0.18   Tc(MIN.) =   27.56
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.993
 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        0.22      0.75     0.400    56
 COMMERCIAL                 B        0.35      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) =    1.07
 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) =     163.22

 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) =  28.27
 FLOW VELOCITY(FEET/SEC.) =  9.77   DEPTH*VELOCITY(FT*FT/SEC.) =   6.89

 *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 MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
 ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) =  41.36
 PIPE-FLOW(CFS) =     130.04
 PIPEFLOW TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =  27.43
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.999
 SUBAREA AREA(ACRES) =    0.68      SUBAREA RUNOFF(CFS) =    1.07
 TOTAL AREA(ACRES) =      119.3        PEAK FLOW RATE(CFS) =     163.85

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =   33.81
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.46
  HALFSTREET FLOOD WIDTH(FEET) =   16.48
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.97
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.72
 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
----------------------------------------------------------------------------
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```
  >>>>>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 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
  "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
```



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  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) =  0.67
    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      Fp         Ap     SCS
       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) =    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
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    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):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       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      Fp         Ap     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"       B        0.02      0.75     0.600    56
  COMMERCIAL                 B        0.11      0.75     0.100    56
```



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  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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     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
```

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

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(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      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
RESIDENTIAL
"8-10 DWELLINGS/ACRE"      B        0.33      0.75     0.400    56
COMMERCIAL                 B        2.57      0.75     0.100    56
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
MOBILE HOME PARK           B        0.01      0.75     0.250    56
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
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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) =   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
 NUMBER     (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
    2      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 Ap =  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        9.08      0.75     0.400    56
  COMMERCIAL                 B        5.79      0.75     0.100    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.74      0.75     0.500    56
```

```
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.22      0.75     0.900    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.302
  SUBAREA AREA(ACRES) =   15.83      SUBAREA RUNOFF(CFS) =   34.14
  EFFECTIVE AREA(ACRES) =    126.24    AREA-AVERAGED Fm(INCH/HR) =  0.60
  AREA-AVERAGED Fp(INCH/HR) =  0.72  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =      172.3        PEAK FLOW RATE(CFS) =     229.74

  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) = 0.82   HALFSTREET FLOOD WIDTH(FEET) =  34.19
  FLOW VELOCITY(FEET/SEC.) =  9.53   DEPTH*VELOCITY(FT*FT/SEC.) =   7.85

  *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) =  30.00    NUMBER OF PIPES =   1
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  41.50
  PIPE-FLOW(CFS) =     203.87
  PIPEFLOW TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =  17.05
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.659
  SUBAREA AREA(ACRES) =   15.83      SUBAREA RUNOFF(CFS) =   34.67
  TOTAL AREA(ACRES) =      172.3        PEAK FLOW RATE(CFS) =     233.96

  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) =   30.09
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.46
    HALFSTREET FLOOD WIDTH(FEET) =   16.63
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.22
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.39

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      253.59   17.05    2.659  0.72( 0.43) 0.59     126.2   20640.00
      2      240.45   27.63    1.991  0.72( 0.44) 0.61     172.3   20620.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     253.59  Tc(MIN.) =   17.05
  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  20646.00 TO NODE  20647.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2046.00  DOWNSTREAM(FEET) =  2030.00
  FLOW LENGTH(FEET) =   325.06   MANNING'S N =  0.013
```



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  DEPTH OF FLOW IN  48.0 INCH PIPE IS  34.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  26.31
  ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     253.59
  PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =   17.26
  LONGEST FLOWPATH FROM NODE  20620.00 TO NODE  20647.00 =    5593.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20647.00 TO NODE  20647.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   17.26
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.640
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK            B       20.06      0.75     0.250    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"          B       29.79      0.75     0.900    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        B       14.97      0.75     0.600    56
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"       B       13.31      0.75     0.400    56
  COMMERCIAL                  B       16.98      0.75     0.100    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"        B       17.61      0.75     0.500    56
  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
  EFFECTIVE AREA(ACRES) =    238.96   AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.73  AREA-AVERAGED Ap =  0.68
  TOTAL AREA(ACRES) =      285.0       PEAK FLOW RATE(CFS) =     461.49

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      481.12   17.26    2.640  0.73( 0.40) 0.55     239.0   20640.00
      2      401.92   27.84    1.981  0.73( 0.41) 0.57     285.0   20620.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     481.12  Tc(MIN.) =   17.26
  AREA-AVERAGED Fm(INCH/HR) =  0.40  AREA-AVERAGED Fp(INCH/HR) =  0.73
  AREA-AVERAGED Ap =  0.55  EFFECTIVE AREA(ACRES) =     238.96

****************************************************************************
  FLOW PROCESS FROM NODE  20647.00 TO NODE  20648.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2030.00  DOWNSTREAM(FEET) =  2025.00
  FLOW LENGTH(FEET) =   149.90   MANNING'S N =  0.013
  DEPTH OF FLOW IN  63.0 INCH PIPE IS  49.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  26.28
  ESTIMATED PIPE DIAMETER(INCH) =  63.00    NUMBER OF PIPES =   1
```

```
  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         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      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
      2      705.47   20.80    2.361  0.74( 0.42) 0.57     398.7   20600.00
      3      602.20   27.94    1.977  0.74( 0.42) 0.57     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
```



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  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) =     726.01
    ***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         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        2.58      0.75     0.500    56
  COMMERCIAL                 B        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"               B        0.08      0.61     1.000    66
  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) =     719.20
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
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 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
     1      721.99   17.71    2.600  0.74( 0.41) 0.56     366.6   20640.00
     2      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
```



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****************************************************************************
 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      Fp         Ap      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) =     21.06

 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
```

```
     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) =      54.18
    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      Fp         Ap     SCS
       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"       B        1.35      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) =    7.57      SUBAREA RUNOFF(CFS) =   19.93
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  EFFECTIVE AREA(ACRES) =     23.51    AREA-AVERAGED Fm(INCH/HR) =  0.51
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        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) =   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
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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        0.22      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.46      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        1.74      0.75     0.700    56
  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.

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  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
  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     SCS
       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) =    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
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  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 =      72.74

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      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
      1      606.90   28.25    1.964  0.74( 0.42) 0.57     436.6   20620.00
      2       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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      731.39   13.02    3.127  0.74( 0.42) 0.57     300.2   20649.00
      2      780.12   17.71    2.600  0.74( 0.42) 0.57     397.3   20640.00
      3      756.32   21.15    2.337  0.74( 0.42) 0.57     436.2   20600.00
      4      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.) =    17.71
  EFFECTIVE AREA(ACRES) =     397.30   AREA-AVERAGED Fm(INCH/HR) =  0.42
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.57
  TOTAL 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
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  1.38
    HALFSTREET FLOOD WIDTH(FEET) =   61.84
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    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.66      0.75     0.500    56
  COMMERCIAL                 B        1.28      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.16      0.75     0.600    56
  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 =  0.56
  TOTAL AREA(ACRES) =      470.8        PEAK FLOW RATE(CFS) =     780.12
  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

  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.) =  45.25
  PIPE-FLOW(CFS) =     642.48
  PIPEFLOW 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) =     784.45

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 6.50
  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) =  0.77
    HALFSTREET 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
      2      784.45   17.79    2.592  0.74( 0.42) 0.56     400.9   20640.00
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     3      756.32   21.24    2.331  0.74( 0.42) 0.57     439.8   20600.00
     4      650.99   28.34    1.961  0.74( 0.42) 0.57     470.8   20620.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     784.45  Tc(MIN.) =   17.79
  AREA-AVERAGED Fm(INCH/HR) =  0.42  AREA-AVERAGED Fp(INCH/HR) =  0.74
  AREA-AVERAGED Ap =  0.56  EFFECTIVE AREA(ACRES) =     400.89
  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) =   0.83

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     823.24
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  1.42
    HALFSTREET FLOOD WIDTH(FEET) =   63.79
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   10.03
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   14.19
  STREET FLOW TRAVEL TIME(MIN.) =   0.70   Tc(MIN.) =   18.50
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.533
  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        0.99      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
  "2 DWELLINGS/ACRE"         B       35.47      0.75     0.700    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) =   77.57
  EFFECTIVE AREA(ACRES) =    443.03    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) =     840.57

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 5.86

  END OF SUBAREA STREET FLOW HYDRAULICS:
```



```
  DEPTH(FEET) = 1.43   HALFSTREET FLOOD WIDTH(FEET) =  64.34
  FLOW VELOCITY(FEET/SEC.) = 10.06   DEPTH*VELOCITY(FT*FT/SEC.) =  14.36

  *NOTE: ESTIMATED STREET FLOW DEPTH IS GREATER THAN
         THE MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) = 0.83
  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.) =  45.61
  PIPE-FLOW(CFS) =     726.10
  PIPEFLOW TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =  17.95
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.579
  SUBAREA AREA(ACRES) =   42.14      SUBAREA RUNOFF(CFS) =   79.31
  TOTAL AREA(ACRES) =      513.0        PEAK FLOW RATE(CFS) =     858.94

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 5.86
  STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =  132.84
    ***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.) =    6.65
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.06

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      829.54   13.26    3.092  0.74( 0.43) 0.58     346.0   20649.00
      2      858.94   17.95    2.579  0.74( 0.42) 0.57     443.0   20640.00
      3      821.71   21.39    2.321  0.74( 0.43) 0.58     481.9   20600.00
      4      704.26   28.48    1.955  0.74( 0.43) 0.58     513.0   20620.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     858.94  Tc(MIN.) =   17.95
  AREA-AVERAGED Fm(INCH/HR) =  0.42  AREA-AVERAGED Fp(INCH/HR) =  0.74
  AREA-AVERAGED Ap =  0.57  EFFECTIVE AREA(ACRES) =     443.03
  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
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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      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
RESIDENTIAL
"5-7 DWELLINGS/ACRE"       B        1.69      0.75     0.500    56
RESIDENTIAL
"2 DWELLINGS/ACRE"         B       14.94      0.75     0.700    56
COMMERCIAL                 B        1.47      0.75     0.100    56
NATURAL FAIR COVER
"OPEN BRUSH"               B        1.34      0.61     1.000    66
RESIDENTIAL
"3-4 DWELLINGS/ACRE"       B        1.78      0.75     0.600    56
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***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.79
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  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)           (ACRES)    NODE
    1      861.89   13.65    3.039  0.74( 0.43) 0.58     367.2   20649.00
    2      885.27   18.34    2.546  0.74( 0.43) 0.58     464.3   20640.00
    3      845.59   21.78    2.296  0.74( 0.43) 0.58     503.1   20600.00
    4      725.56   28.83    1.941  0.74( 0.43) 0.58     534.2   20620.00
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) =     464.25
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:
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
PEAK FLOW RATE(CFS)   =     885.27
============================================================================
============================================================================
END OF RATIONAL METHOD ANALYSIS
```

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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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             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

  *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
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 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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.204
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.627
  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        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
  TOTAL AREA(ACRES) =      9.99   PEAK FLOW RATE(CFS) =     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
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```
 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      Fp         Ap     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
 "OPEN BRUSH"               B        2.38      0.61     1.000    66
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"      B        0.08      0.75     0.400    56
 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) =     24.82
 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
 TOTAL AREA(ACRES) =       16.6         PEAK FLOW RATE(CFS) =      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      Fp         Ap     SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        2.10      0.75     0.600    56
 NATURAL FAIR COVER
 "OPEN BRUSH"               B        3.64      0.61     1.000    66
 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
```



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 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         Ap     SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL FAIR COVER
 "OPEN BRUSH"               B        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.

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 FLOW PROCESS FROM NODE  20704.00 TO NODE  20705.00 IS CODE =  92
----------------------------------------------------------------------------
 >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
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==========================================================================
  UPSTREAM NODE ELEVATION(FEET) =   2070.00
  DOWNSTREAM NODE ELEVATION(FEET) =   2065.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   236.79
  "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) =  2.305
  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        4.91      0.75     0.400    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.39      0.75     0.600    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.79      0.61     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.72
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.518
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     49.16
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.48
  AVERAGE FLOW DEPTH(FEET) =   0.70   FLOOD WIDTH(FEET) =   44.30
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.72   Tc(MIN.) =   13.94
  SUBAREA AREA(ACRES) =    8.09       SUBAREA RUNOFF(CFS) =   14.06
  EFFECTIVE AREA(ACRES) =   33.33     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.68  AREA-AVERAGED Ap =   0.72
  TOTAL AREA(ACRES) =       33.3         PEAK FLOW RATE(CFS) =      54.49

  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) =  0.72   FLOOD WIDTH(FEET) =   46.39
  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.

****************************************************************************
  FLOW PROCESS FROM NODE  20705.00 TO NODE  20706.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2065.00  DOWNSTREAM ELEVATION(FEET) = 2060.00
  STREET LENGTH(FEET) =   308.42   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) =      57.86
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    ***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.) =    4.66
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.90
  STREET FLOW TRAVEL TIME(MIN.) =   1.10   Tc(MIN.) =   15.04
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.202
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        3.14      0.61     1.000    66
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.43      0.75     0.600    56
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        0.92      0.75     0.400    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.64
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.839
  SUBAREA AREA(ACRES) =    4.49       SUBAREA RUNOFF(CFS) =    6.74
  EFFECTIVE AREA(ACRES) =     37.82    AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap =  0.73
  TOTAL AREA(ACRES) =       37.8         PEAK FLOW RATE(CFS) =      58.14

  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) = 0.62   HALFSTREET FLOOD WIDTH(FEET) =  24.24
  FLOW VELOCITY(FEET/SEC.) =  4.66   DEPTH*VELOCITY(FT*FT/SEC.) =   2.91
  LONGEST FLOWPATH FROM NODE  20700.00 TO NODE  20706.00 =    2351.93 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20706.00 TO NODE  20707.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2060.00  DOWNSTREAM ELEVATION(FEET) = 2055.00
  STREET LENGTH(FEET) =   216.66   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) =   0.87

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      58.79
    ***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.) =    5.29
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  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.15
 STREET FLOW TRAVEL TIME(MIN.) =   0.68   Tc(MIN.) =   15.73
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.144
 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        0.78      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) =    0.78      SUBAREA RUNOFF(CFS) =    1.29
 EFFECTIVE AREA(ACRES) =     38.60    AREA-AVERAGED Fm(INCH/HR) =  0.49
 AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap =  0.73
 TOTAL AREA(ACRES) =       38.6        PEAK FLOW RATE(CFS) =      58.14
 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

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.59   HALFSTREET FLOOD WIDTH(FEET) =  22.65
 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.

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 FLOW PROCESS FROM NODE  20707.00 TO NODE  20708.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 2055.00  DOWNSTREAM ELEVATION(FEET) = 2040.00
 STREET LENGTH(FEET) =   337.91   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) =      63.26
   ***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.) =    6.76
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.76
 STREET FLOW TRAVEL TIME(MIN.) =   0.83   Tc(MIN.) =   16.56
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.078
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL FAIR COVER
 "OPEN BRUSH"               B        4.36      0.61     1.000    66
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 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        1.39      0.75     0.700    56
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"      B        1.58      0.75     0.400    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.65
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.814
 SUBAREA AREA(ACRES) =    7.33      SUBAREA RUNOFF(CFS) =   10.22
 EFFECTIVE AREA(ACRES) =     45.93    AREA-AVERAGED Fm(INCH/HR) =  0.50
 AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap =  0.74
 TOTAL AREA(ACRES) =       45.9        PEAK FLOW RATE(CFS) =      65.42

 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) = 0.56   HALFSTREET FLOOD WIDTH(FEET) =  21.00
 FLOW VELOCITY(FEET/SEC.) =  6.85   DEPTH*VELOCITY(FT*FT/SEC.) =   3.83
 LONGEST FLOWPATH FROM NODE  20700.00 TO NODE  20708.00 =    2906.50 FEET.

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 FLOW PROCESS FROM NODE  20708.00 TO NODE  20709.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION # 14 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 2040.00  DOWNSTREAM ELEVATION(FEET) = 2035.00
 STREET LENGTH(FEET) =   377.00   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 =  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) =      68.63
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.89
   HALFSTREET FLOOD WIDTH(FEET) =   47.97
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.60
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.10
 STREET FLOW TRAVEL TIME(MIN.) =   1.37   Tc(MIN.) =   17.93
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.982
 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        0.45      0.75     0.700    56
 NATURAL FAIR COVER
 "OPEN BRUSH"               B        1.33      0.61     1.000    66
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"      B        1.75      0.75     0.400    56
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"       B        1.06      0.75     0.500    56
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  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.69
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.626
  SUBAREA AREA(ACRES) =    4.59      SUBAREA RUNOFF(CFS) =    6.41
  EFFECTIVE AREA(ACRES) =     50.52    AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap =  0.73
  TOTAL AREA(ACRES) =       50.5        PEAK FLOW RATE(CFS) =      67.84

  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 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
  LONGEST FLOWPATH FROM NODE  20700.00 TO NODE  20709.00 =    3283.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20709.00 TO NODE  20710.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 14 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2035.00  DOWNSTREAM ELEVATION(FEET) = 2030.00
  STREET LENGTH(FEET) =   326.96   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) =   1.06

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      70.47
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.88
    HALFSTREET FLOOD WIDTH(FEET) =   46.72
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.92
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.32
  STREET FLOW TRAVEL TIME(MIN.) =   1.11   Tc(MIN.) =   19.03
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.912
  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        0.82      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.94      0.61     1.000    66
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        1.18      0.75     0.400    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        1.02      0.75     0.500    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.70
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.630
  SUBAREA AREA(ACRES) =    3.96      SUBAREA RUNOFF(CFS) =    5.25
  EFFECTIVE AREA(ACRES) =     54.48    AREA-AVERAGED Fm(INCH/HR) =  0.49
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  AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap =  0.72
  TOTAL AREA(ACRES) =       54.5        PEAK FLOW RATE(CFS) =      69.91

  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) = 0.88   HALFSTREET FLOOD WIDTH(FEET) =  46.56
  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.

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  FLOW PROCESS FROM NODE  20710.00 TO NODE  20711.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 14 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2030.00  DOWNSTREAM ELEVATION(FEET) = 2025.00
  STREET LENGTH(FEET) =   298.59   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) =   1.04

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      73.36
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.88
    HALFSTREET FLOOD WIDTH(FEET) =   46.56
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.14
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.52
  STREET FLOW TRAVEL TIME(MIN.) =   0.97   Tc(MIN.) =   20.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.856
  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        4.34      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.10      0.61     1.000    66
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        0.27      0.75     0.400    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.92      0.75     0.500    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.658
  SUBAREA AREA(ACRES) =    5.63      SUBAREA RUNOFF(CFS) =    6.92
  EFFECTIVE AREA(ACRES) =     60.11    AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.68  AREA-AVERAGED Ap =  0.72
  TOTAL AREA(ACRES) =       60.1        PEAK FLOW RATE(CFS) =      74.08

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
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  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) = 0.88   HALFSTREET FLOOD WIDTH(FEET) =  46.87
  FLOW VELOCITY(FEET/SEC.) =  5.14   DEPTH*VELOCITY(FT*FT/SEC.) =   4.53
  LONGEST FLOWPATH FROM NODE  20700.00 TO NODE  20711.00 =    3909.05 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20711.00 TO NODE  20712.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2025.00  DOWNSTREAM(FEET) =   2020.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   279.66   CHANNEL SLOPE =  0.0179
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      74.08
  FLOW VELOCITY(FEET/SEC.) =   5.88   FLOW DEPTH(FEET) =   1.55
  TRAVEL TIME(MIN.) =   0.79   Tc(MIN.) =   20.79
  LONGEST FLOWPATH FROM NODE  20700.00 TO NODE  20712.00 =    4188.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20712.00 TO NODE  20712.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   20.79
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.813
  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        2.62      0.75     0.700    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.72      0.75     0.500    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.657
  SUBAREA AREA(ACRES) =    3.34      SUBAREA RUNOFF(CFS) =    3.97
  EFFECTIVE AREA(ACRES) =     63.45   AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.68  AREA-AVERAGED Ap =  0.71
  TOTAL AREA(ACRES) =       63.5       PEAK FLOW RATE(CFS) =      75.74

  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  20712.00 TO NODE  20713.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2020.00  DOWNSTREAM(FEET) =   2000.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   371.84   CHANNEL SLOPE =  0.0538
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   2.50
  CHANNEL FLOW THRU SUBAREA(CFS) =      75.74
  FLOW VELOCITY(FEET/SEC.) =   8.53   FLOW DEPTH(FEET) =   1.13
```



```
  TRAVEL TIME(MIN.) =   0.73   Tc(MIN.) =   21.52
  LONGEST FLOWPATH FROM NODE  20700.00 TO NODE  20713.00 =    4560.55 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20713.00 TO NODE  20713.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   21.52
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.776
  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        2.10      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        3.26      0.61     1.000    66
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        1.09      0.75     0.500    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.67
  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
  AREA-AVERAGED Fp(INCH/HR) =  0.68  AREA-AVERAGED Ap =  0.72
  TOTAL AREA(ACRES) =       69.9       PEAK FLOW RATE(CFS) =      80.78

  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  20713.00 TO NODE  20714.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2000.00  DOWNSTREAM(FEET) =   1960.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   732.38   CHANNEL SLOPE =  0.0546
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   2.50
  CHANNEL FLOW THRU SUBAREA(CFS) =      80.78
  FLOW VELOCITY(FEET/SEC.) =   8.99   FLOW DEPTH(FEET) =   1.21
  TRAVEL TIME(MIN.) =   1.36   Tc(MIN.) =   22.88
  LONGEST FLOWPATH FROM NODE  20700.00 TO NODE  20714.00 =    5292.93 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20724.00 TO NODE  20724.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   22.88
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.712
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.63      0.61     1.000    66
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        1.94      0.75     0.500    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 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
  "3-4 DWELLINGS/ACRE"       B        0.21      0.75     0.600    56    8.74
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        1.38      0.61     1.000    66   14.97
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        5.85      0.75     0.700    56    9.29
  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
```



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  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 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
  "3-4 DWELLINGS/ACRE"       B        0.21      0.75     0.600    56    7.77
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.34      0.61     1.000    66   13.31
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        4.69      0.75     0.700    56    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       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     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
      2       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.
```

```
 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     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
     2       33.11    8.74    3.050  0.70( 0.54) 0.77      14.7   20718.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      34.02    Tc(MIN.) =     7.77
 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 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) =      44.86

 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
```



```
 RAINFALL INTENSITY(INCH/HR) =   3.12
 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      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        1.32      0.75     0.700    56
 NATURAL FAIR COVER
 "OPEN BRUSH"               B        4.12      0.61     1.000    66
 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
```

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  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.29   Tc(MIN.) =   11.97
  SUBAREA AREA(ACRES) =    5.44       SUBAREA RUNOFF(CFS) =    9.47
  EFFECTIVE AREA(ACRES) =   11.09     AREA-AVERAGED Fm(INCH/HR) =   0.56
  AREA-AVERAGED Fp(INCH/HR) =   0.69  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =       11.1          PEAK FLOW RATE(CFS) =      19.64

  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) =   23.24
  FLOW VELOCITY(FEET/SEC.) =   6.70   DEPTH*VELOCITY(FT*FT/SEC) =   3.50
  LONGEST FLOWPATH FROM NODE  20720.00 TO NODE  20722.00 =    1162.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20722.00 TO NODE  20722.00 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.) =   11.97
  RAINFALL INTENSITY(INCH/HR) =   2.53
  AREA-AVERAGED Fm(INCH/HR) =  0.56
  AREA-AVERAGED Fp(INCH/HR) =  0.69
  AREA-AVERAGED Ap =  0.81
  EFFECTIVE STREAM AREA(ACRES) =      11.09
  TOTAL STREAM AREA(ACRES) =      11.09
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      19.64

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       44.86    8.43    3.117  0.72( 0.54) 0.75      19.3   20718.50
      1       43.19    9.40    2.919  0.72( 0.54) 0.75      20.2   20718.00
      2       19.64   11.97    2.525  0.69( 0.56) 0.81      11.1   20720.00

  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       62.85    8.43    3.117  0.71( 0.54) 0.77      27.1   20718.50
      2       61.71    9.40    2.919  0.71( 0.54) 0.77      28.9   20718.00
      3       55.69   11.97    2.525  0.70( 0.55) 0.77      31.2   20720.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      62.85    Tc(MIN.) =     8.43
  EFFECTIVE AREA(ACRES) =      27.14   AREA-AVERAGED Fm(INCH/HR) =  0.54
  AREA-AVERAGED Fp(INCH/HR) =  0.71  AREA-AVERAGED Ap =  0.77
  TOTAL AREA(ACRES) =       31.2
  LONGEST FLOWPATH FROM NODE  20720.00 TO NODE  20722.00 =    1162.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20722.00 TO NODE  20723.00 IS CODE =  92
----------------------------------------------------------------------------
```



```
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =   2015.00
  DOWNSTREAM NODE ELEVATION(FEET) =   2000.00
  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
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.01700
  MAXIMUM DEPTH(FEET) =   1.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.772
  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        5.92      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        5.87      0.61     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.67
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.849
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     74.51
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.10
  AVERAGE FLOW DEPTH(FEET) =   0.77   FLOOD WIDTH(FEET) =   52.21
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.82   Tc(MIN.) =   10.25
  SUBAREA AREA(ACRES) =   11.79       SUBAREA RUNOFF(CFS) =   23.38
  EFFECTIVE AREA(ACRES) =   38.93     AREA-AVERAGED Fm(INCH/HR) =   0.55
  AREA-AVERAGED Fp(INCH/HR) =   0.69  AREA-AVERAGED Ap =   0.79
  TOTAL AREA(ACRES) =       43.0          PEAK FLOW RATE(CFS) =      77.81

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.78   FLOOD WIDTH(FEET) =   53.26
  FLOW VELOCITY(FEET/SEC.) =   6.13   DEPTH*VELOCITY(FT*FT/SEC) =   4.76
  LONGEST FLOWPATH FROM NODE  20720.00 TO NODE  20723.00 =    1827.20 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20723.00 TO NODE  20724.00 IS CODE =  92
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =   2000.00
  DOWNSTREAM NODE ELEVATION(FEET) =   1960.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =     2.00
  "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) =  2.772
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        9.77      0.61     1.000    66
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.38      0.75     0.500    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.62
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.981
```

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  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     87.70
  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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       97.60   10.25    2.772  0.68( 0.56) 0.83      49.1   20718.50
      2       94.24   11.24    2.623  0.68( 0.56) 0.83      50.8   20718.00
      3       83.88   13.85    2.314  0.68( 0.56) 0.83      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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   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
      2      164.35   11.24    2.623  0.68( 0.53) 0.79      87.4   20718.00
      3      157.74   13.85    2.314  0.68( 0.53) 0.78      98.3   20720.00
      4      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
```



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----------------------------------------------------------------------------
  >>>>>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:
   STREAM       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
      2      885.27   18.34  0.74( 0.43) 0.58     464.3   20640.00
      3      845.59   21.78  0.74( 0.43) 0.58     503.1   20600.00
      4      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       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
      2      885.27   18.34  0.74( 0.43) 0.58     464.3   20640.00
      3      845.59   21.78  0.74( 0.43) 0.58     503.1   20600.00
      4      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 =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 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) =     897.46
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  1.30
   HALFSTREET FLOOD WIDTH(FEET) =   58.23
   AVERAGE FLOW VELOCITY(FEET/SEC.) =   13.09
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   17.08
 STREET FLOW TRAVEL TIME(MIN.) =   1.20   Tc(MIN.) =   19.54
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.882
 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        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    56
 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) =   24.38
 EFFECTIVE AREA(ACRES) =    484.71    AREA-AVERAGED Fm(INCH/HR) =  0.43
 AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.59
 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

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.30   HALFSTREET FLOOD WIDTH(FEET) =  57.93
```



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 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 Tc :
 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
     2      885.27   18.87    1.921  0.74( 0.43) 0.59     484.7   20640.00
     3      845.59   22.32    1.738  0.74( 0.43) 0.59     523.6   20600.00
     4      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       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     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
     3      157.74   13.92    2.306  0.68( 0.53) 0.78      98.3   20720.00
     4      136.75   22.96    1.709  0.68( 0.52) 0.77     127.7   20700.00
 LONGEST FLOWPATH FROM NODE  20700.00 TO NODE  20725.00 =    5374.33 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      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
     2      975.35   11.31    2.612  0.72( 0.46) 0.64     396.5   20718.00
     3     1015.44   13.92    2.306  0.72( 0.46) 0.63     478.7   20720.00
```

```
      4     1019.01   14.19    2.280  0.72( 0.46) 0.63     486.8   20649.00
      5     1031.50   18.87    1.921  0.72( 0.45) 0.62     599.1   20640.00
      6      983.82   22.32    1.738  0.72( 0.45) 0.62     649.2   20600.00
      7      971.39   22.96    1.709  0.72( 0.45) 0.63     654.1   20700.00
      8      835.46   29.31    1.476  0.72( 0.45) 0.63     682.3   20620.00
    TOTAL AREA(ACRES) =       682.3

  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.
   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) = 16.42  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
```



```
  LONGEST 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.) =   30.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.455
  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        3.96      0.75     0.500    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        4.31      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       14.46      0.61     1.000    66
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.98      0.75     0.600    56
  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) =      706.0
  LONGEST FLOWPATH FROM NODE  20620.00 TO NODE  20726.00 =   10044.86 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) = 16.42  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.
```

```
****************************************************************************
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        1.92      0.75     0.500    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        6.30      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       12.35      0.61     1.000    66
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.34      0.75     0.600    56
  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= 0.41;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= 1.00
  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=.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) =    1031.50
  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  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.) =   31.03
  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.) =   31.03
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.426
  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        3.88      0.75     0.500    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       12.91      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        6.79      0.75     0.600    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        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= 0.41;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= 1.00
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =      752.9
  LONGEST FLOWPATH FROM NODE  20620.00 TO NODE  20728.00 =   11638.30 FEET.
   EQUIVALENT 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) =    1031.50
  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  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.) =   31.23
  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<<<<<
```

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==========================================================================
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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= 0.41;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 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        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
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.828
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        5.96      0.61     1.000    66
  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
```

```
  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
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.656
  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        0.59      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        7.70      0.61     1.000    66
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        5.46      0.75     0.500    56
  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
  TOTAL AREA(ACRES) =       29.7       PEAK FLOW RATE(CFS) =      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
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.515
  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       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"       B        4.95      0.75     0.500    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       17.32      0.61     1.000    66
  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) =  115.55
  EFFECTIVE 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) =     169.46

  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) =   2.51
  AREA-AVERAGED Fm(INCH/HR) =  0.52
  AREA-AVERAGED Fp(INCH/HR) =  0.69
  AREA-AVERAGED Ap =  0.76
  EFFECTIVE 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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.865
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.539
  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        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) =     14.02

  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
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.393
  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        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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        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) =   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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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) =    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<<<<<
```

```
  >>>>>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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        6.61      0.75     0.700    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 =  0.697
  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):
```



```
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     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"         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) =   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
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.780
  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        0.57      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        9.61      0.75     0.700    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.694
  SUBAREA AREA(ACRES) =   10.18      SUBAREA RUNOFF(CFS) =   11.55
  EFFECTIVE AREA(ACRES) =     53.02   AREA-AVERAGED Fm(INCH/HR) =  0.52
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.70
  TOTAL AREA(ACRES) =       53.0       PEAK FLOW RATE(CFS) =      60.04

  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  20747.00 TO NODE  20748.00 IS CODE =  54
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1840.00  DOWNSTREAM(FEET) =   1815.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   752.37   CHANNEL SLOPE =  0.0332
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  15.000
  MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      60.04
  FLOW VELOCITY(FEET/SEC.) =   3.85   FLOW DEPTH(FEET) =   1.02
  TRAVEL TIME(MIN.) =   3.26   Tc(MIN.) =   24.70
  LONGEST FLOWPATH FROM NODE  20740.00 TO NODE  20748.00 =    4550.01 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20748.00 TO NODE  20748.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   24.70
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.635
  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        8.54      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.23      0.75     0.600    56
  PUBLIC PARK                B        0.78      0.75     0.850    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        1.16      0.75     0.500    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.673
  SUBAREA AREA(ACRES) =   12.71      SUBAREA RUNOFF(CFS) =   12.94
  EFFECTIVE AREA(ACRES) =     65.73   AREA-AVERAGED Fm(INCH/HR) =  0.52
  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):
  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<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =   24.70
  RAINFALL INTENSITY(INCH/HR) =   1.64
  AREA-AVERAGED Fm(INCH/HR) =  0.52
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.69
  EFFECTIVE STREAM AREA(ACRES) =      65.73
  TOTAL STREAM AREA(ACRES) =      65.73
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      66.08
  ** CONFLUENCE DATA **
  STREAM      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
```



```
     1      1031.50   31.23      753.64    20620.00
     2       169.46   12.05       94.59    20730.00
     3        66.08   24.70       65.73    20740.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.40;30M= 0.81;1H= 1.06;3H= 1.82;6H= 2.54;24H= 5.79
  S-GRAPH: VALLEY(DEV.)= 76.6%;VALLEY(UNDEV.)/DESERT= 23.4%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.52; LAG(HR) = 0.42; Fm(INCH/HR) = 0.47; Ybar = 0.48
  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
  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) =     240.33
  PEAK FLOW RATE(CFS) =     956.94
    (UPSTREAM NODE PEAK FLOW RATE(CFS) =    1031.50)
  PEAK FLOW RATE(CFS) USED =    1031.50

****************************************************************************
  FLOW PROCESS FROM NODE  20748.00 TO NODE  20749.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1815.00  DOWNSTREAM(FEET) =   1700.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2764.03   CHANNEL SLOPE =  0.0416
  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.) =  29.50   FLOW DEPTH(FEET) =   2.64
  TRAVEL TIME(MIN.) =   1.56   Tc(MIN.) =   32.79
  LONGEST FLOWPATH FROM NODE  20620.00 TO NODE  20749.00 =   14662.13 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20749.00 TO NODE  20749.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   32.79
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.379
  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       46.16      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        9.13      0.75     0.600    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B       13.04      0.75     0.500    56
  PUBLIC PARK                B       14.63      0.75     0.850    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.684
  SUBAREA AREA(ACRES) =   82.96
  UNIT-HYDROGRAPH DATA:
```

```
  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) =      996.9
  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
  TOTAL AREA(ACRES) =      996.9       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  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      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B       17.57      0.75     0.500    56
  COMMERCIAL                 B        0.79      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       11.86      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       51.53      0.75     0.700    56
  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%
```



```
  Tc(HR) = 0.58; LAG(HR) = 0.46; Fm(INCH/HR) = 0.47; Ybar = 0.49
  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      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        5.98      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) =     15.18

  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  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) =      15.18
  FLOW VELOCITY(FEET/SEC.) =   0.89   FLOW DEPTH(FEET) =   0.04
  TRAVEL TIME(MIN.) =   9.03   Tc(MIN.) =   21.47
  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.) =   21.47
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.779
  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        0.44      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        4.07      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) =    4.51      SUBAREA RUNOFF(CFS) =    5.12
  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) =      15.18
  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  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

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      28.96
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.44
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    HALFSTREET FLOOD WIDTH(FEET) =   15.93
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.45
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.43
  STREET FLOW TRAVEL TIME(MIN.) =   1.25   Tc(MIN.) =   22.72
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.719
  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        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) =   27.55
  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) =      41.84

  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 STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.49   HALFSTREET FLOOD WIDTH(FEET) =  18.00
  FLOW VELOCITY(FEET/SEC.) =  6.01   DEPTH*VELOCITY(FT*FT/SEC.) =   2.96
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  408.2 FT WITH ELEVATION-DROP =  20.0 FT, IS   59.9 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
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      47.97
    ***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.) =    6.94
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.41
  STREET FLOW TRAVEL TIME(MIN.) =   1.45   Tc(MIN.) =   24.16
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 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.657
 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        9.79      0.75     0.700    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        1.89      0.75     0.600    56
 SCHOOL                     B        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) =   12.27
 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) =      51.94

 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) = 0.50   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  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) =      71.67
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.61
   HALFSTREET FLOOD WIDTH(FEET) =   23.57
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.05
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.70
 STREET FLOW TRAVEL TIME(MIN.) =   1.94   Tc(MIN.) =   26.10
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.582
 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       31.15      0.75     0.700    56
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 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        6.15      0.75     0.600    56
 SCHOOL                     B        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) =   39.46
 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) =      88.00

 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) = 0.65   HALFSTREET FLOOD WIDTH(FEET) =  25.52
 FLOW VELOCITY(FEET/SEC.) =  6.40   DEPTH*VELOCITY(FT*FT/SEC.) =   4.16
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        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
 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) =      93.35
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.61
   HALFSTREET FLOOD WIDTH(FEET) =   23.32
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    8.04
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.88
 STREET FLOW TRAVEL TIME(MIN.) =   1.63   Tc(MIN.) =   27.73
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.525
 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        9.12      0.75     0.700    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        2.57      0.75     0.600    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
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  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.678
  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) =      94.08

  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
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.20
  STREET FLOW TRAVEL TIME(MIN.) =   1.62   Tc(MIN.) =   29.36
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.474
  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        8.65      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 =  0.681
  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) =      98.63

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
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  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) = 0.60   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) =  0.71
    HALFSTREET FLOOD WIDTH(FEET) =   28.51
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.30
    PRODUCT 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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       50.96      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       11.45      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) =   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,
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        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
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.351
  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       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) =   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<<<<<
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  >>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
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.320
  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       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     0.850    56
  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
  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.

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 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
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.293
 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       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
 TOTAL AREA(ACRES) =      324.2       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
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.263
 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        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) =   27.64
 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:
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 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
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.246
 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       19.08      0.75     0.500    56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B      133.50      0.75     0.700    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B       16.16      0.75     0.600    56
 COMMERCIAL                 B       11.70      0.75     0.100    56
 MOBILE HOME PARK           B        5.20      0.75     0.250    56
 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
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  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 **
  STREAM      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1      1048.92   34.77     1078.67    20620.00
     2       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.
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****************************************************************************
  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      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        B       27.93      0.75      0.600    56
  MOBILE HOME PARK            B        2.86      0.75      0.250    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"          B       36.04      0.75      0.700    56
  PUBLIC PARK                 B        0.07      0.75      0.850    56
  COMMERCIAL                  B        0.16      0.75      0.100    56
  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= 1.00
  UNIT-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) =    1495.29
  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  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.) =     36.75
  AREA-AVERAGED Fm(INCH/HR)=  0.48   Ybar =  0.51
  PEAK FLOW RATE(CFS)   =   1495.29
============================================================================
============================================================================
  END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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             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 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 SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 1.1910

  *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
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 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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.095
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.470
  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        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) =     23.00
  TOTAL 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
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  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  10.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      30.47
    ***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      Fp         Ap     SCS
       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) =   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
```



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  Manning's FRICTION FACTOR for Streetflow Section(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) =      43.12
    ***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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.63      0.75     0.600    56
  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:
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```
    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      Fp         Ap     SCS
       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    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) =    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) =      69.30
    ***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      Fp         Ap     SCS
       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) =   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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        7.96      0.75     0.700    56
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  RESIDENTIAL
  "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 AREA FRACTION, Ap =  0.679
  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
  TOTAL AREA(ACRES) =       48.8        PEAK FLOW RATE(CFS) =      97.73

  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) = 0.73   HALFSTREET FLOOD WIDTH(FEET) =  29.73
  FLOW VELOCITY(FEET/SEC.) =  5.31   DEPTH*VELOCITY(FT*FT/SEC.) =   3.90
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  315.2 FT WITH ELEVATION-DROP =   5.0 FT, IS   28.1 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE  20805.00
  LONGEST FLOWPATH FROM NODE  20800.00 TO NODE  20805.00 =    2233.04 FEET.

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  FLOW PROCESS FROM NODE  20805.00 TO NODE  20806.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  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

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =     146.04
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.70
    HALFSTREET FLOOD WIDTH(FEET) =   27.96
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    8.92
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.24
  STREET FLOW TRAVEL TIME(MIN.) =   1.15   Tc(MIN.) =   16.15
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.618
  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       36.94      0.75     0.700    56
  SCHOOL                     B        3.99      0.75     0.600    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        9.63      0.75     0.600    56
  RESIDENTIAL
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  ".4 DWELLING/ACRE"         B        0.22      0.75     0.900    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.674
  SUBAREA AREA(ACRES) =   50.78      SUBAREA RUNOFF(CFS) =   96.59
  EFFECTIVE AREA(ACRES) =     99.56    AREA-AVERAGED Fm(INCH/HR) =  0.51
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.68
  TOTAL AREA(ACRES) =       99.6        PEAK FLOW RATE(CFS) =     189.10

  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) = 0.76   HALFSTREET FLOOD WIDTH(FEET) =  30.89
  FLOW VELOCITY(FEET/SEC.) =  9.54   DEPTH*VELOCITY(FT*FT/SEC.) =   7.23

  *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.) =  14.63
  PIPE-FLOW(CFS) =      46.00
  PIPEFLOW TRAVEL TIME(MIN.) =   0.70    Tc(MIN.) =  15.70
  * 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

  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) =  147.11
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.70
    HALFSTREET FLOOD WIDTH(FEET) =   28.02
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    8.95
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.27
  LONGEST FLOWPATH FROM NODE  20800.00 TO NODE  20806.00 =    2849.67 FEET.

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  FLOW PROCESS FROM NODE  20806.00 TO NODE  20807.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2098.00  DOWNSTREAM ELEVATION(FEET) = 2090.00
  STREET LENGTH(FEET) =   573.68   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 =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0180
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200
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MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) =   0.90

  **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      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
RESIDENTIAL
"2 DWELLINGS/ACRE"         B        2.85      0.75     0.700    56
RESIDENTIAL
"3-4 DWELLINGS/ACRE"       B        1.45      0.75     0.600    56
SCHOOL                     B        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.
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  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) =     201.82
    ***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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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) =   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
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  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.

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  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         Ap     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"       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) =   41.09
  EFFECTIVE AREA(ACRES) =    137.36    AREA-AVERAGED Fm(INCH/HR) =  0.51
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  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.68
  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.

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  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) =     255.35
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
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  STREET FLOW DEPTH(FEET) =  0.99
  HALFSTREET FLOOD WIDTH(FEET) =   42.61
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.89
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.84
 STREET FLOW TRAVEL TIME(MIN.) =   1.38   Tc(MIN.) =   19.18
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.361
 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       12.89      0.75     0.700    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        2.65      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) =   15.54      SUBAREA RUNOFF(CFS) =   25.88
 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) =     254.91

 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) = 0.99   HALFSTREET FLOOD WIDTH(FEET) =  42.55
 FLOW VELOCITY(FEET/SEC.) =  6.90   DEPTH*VELOCITY(FT*FT/SEC.) =   6.84

 *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) =  48.00    NUMBER OF PIPES =   1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) =  13.94
 PIPE-FLOW(CFS) =     175.31
 PIPEFLOW TRAVEL TIME(MIN.) =   0.68    Tc(MIN.) =  18.48
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.414
 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
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =   86.91
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.70
   HALFSTREET FLOOD WIDTH(FEET) =   27.84
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.35
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.73
 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) =     291.75
   ***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.) =   11.81
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    9.83
 STREET FLOW TRAVEL TIME(MIN.) =   0.87   Tc(MIN.) =   19.35
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.348
 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       30.03      0.75     0.700    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        5.60      0.75     0.600    56
 PUBLIC PARK                B        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) =   59.08
 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) =     312.24

 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
 FLOW VELOCITY(FEET/SEC.) = 11.98   DEPTH*VELOCITY(FT*FT/SEC.) =  10.20

 *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) =  39.00    NUMBER OF PIPES =   1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) =  23.34
 PIPE-FLOW(CFS) =     193.82
 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
 TOTAL AREA(ACRES) =      188.6        PEAK FLOW RATE(CFS) =     317.65
```

```
  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      Fp         Ap     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
  PUBLIC PARK                B       18.85      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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK                B       80.80      0.75     0.850    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B      130.26      0.75     0.700    56
  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
  "OPEN BRUSH"               B        0.24      0.61     1.000    66
  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.

****************************************************************************
```

```
  FLOW PROCESS FROM NODE  20814.00 TO NODE  20814.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   31.32
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.759
  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       11.54      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       58.78      0.75     0.700    56
  PUBLIC PARK                B        6.25      0.75     0.850    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.697
  SUBAREA AREA(ACRES) =   76.57      SUBAREA RUNOFF(CFS) =   85.29
  EFFECTIVE AREA(ACRES) =    530.27   AREA-AVERAGED Fm(INCH/HR) =  0.54
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.72
  TOTAL AREA(ACRES) =      530.3       PEAK FLOW RATE(CFS) =     583.47

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.44; 30M = 0.89; 1HR = 1.17; 3HR = 1.98; 6HR = 2.75; 24HR = 5.50

****************************************************************************
  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  47.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  32.05
  PIPE-FLOW(CFS) =     583.47
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   1.02    Tc(MIN.) =  32.34
  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.) =   32.34
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.726
  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       28.73      0.75     0.600    56
  RESIDENTIAL
  "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
```



```
  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) =     751.45

  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      Fp         Ap     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= 0.42;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.
   EQUIVALENT 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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        8.26      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.53      0.75     0.600    56
  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) =      763.1
  LONGEST FLOWPATH FROM NODE  20800.00 TO NODE  20823.00 =   14651.10 FEET.
   EQUIVALENT 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      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.07      0.75     0.600    56   12.46
  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
  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
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  20821.00 TO NODE  20822.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1720.00  DOWNSTREAM ELEVATION(FEET) = 1700.00
  STREET LENGTH(FEET) =   668.72   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
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      32.62
    ***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.) =    4.69
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.31
  STREET FLOW TRAVEL TIME(MIN.) =   2.38   Tc(MIN.) =   14.84
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.754
  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        4.10      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        9.73      0.75     0.700    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.670
  SUBAREA AREA(ACRES) =   13.83      SUBAREA RUNOFF(CFS) =   28.03
  EFFECTIVE AREA(ACRES) =     21.91    AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.67
  TOTAL AREA(ACRES) =       21.9        PEAK FLOW RATE(CFS) =      44.39

  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) = 0.53   HALFSTREET FLOOD WIDTH(FEET) =  19.60
  FLOW VELOCITY(FEET/SEC.) =  5.28   DEPTH*VELOCITY(FT*FT/SEC.) =   2.81
  LONGEST FLOWPATH FROM NODE  20820.00 TO NODE  20822.00 =    1393.04 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20822.00 TO NODE  20823.00 IS CODE =  33
----------------------------------------------------------------------------
  >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
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```
  UPSTREAM NODE ELEVATION(FEET) =  1700.00
  DOWNSTREAM NODE ELEVATION(FEET) =  1635.00
  FLOW LENGTH(FEET) =  1753.00   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  15.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.56
  PIPE-FLOW(CFS) =      44.39
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   1.87    Tc(MIN.) =  16.72
  * 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
  "2 DWELLINGS/ACRE"         B       28.07      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        8.56      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.677
  SUBAREA AREA(ACRES) =   36.63      SUBAREA RUNOFF(CFS) =   67.84
  EFFECTIVE AREA(ACRES) =     58.54    AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.67
  TOTAL AREA(ACRES) =       58.5        PEAK FLOW RATE(CFS) =     108.50

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.43; 30M = 0.87; 1HR = 1.15; 3HR = 1.96; 6HR = 2.75; 24HR = 5.50

  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) =   64.10
    ***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.) =    6.40
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.65
  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.) =   16.72
  RAINFALL INTENSITY(INCH/HR) =   2.56
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 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 =     108.50
 ** CONFLUENCE DATA **
 STREAM      Q        Tc      AREA      HEADWATER
 NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
    1       825.98   34.24      763.07    20800.00
    2       108.50   16.72       58.54    20820.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.42;30M= 0.86;1H= 1.13;3H= 1.92;6H= 2.68;24H= 5.34
 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 = 0.96; 30M = 0.96; 1HR = 0.96;
 3HR = 0.99; 6HR = 1.00; 24HR= 1.00
 UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =      821.6
 LONGEST FLOWPATH FROM NODE  20800.00 TO NODE  20823.00 =   14651.10 FEET.
  EQUIVALENT 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) =     176.23
 PEAK FLOW RATE(CFS) =     884.95

****************************************************************************
 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) =   16.49
 ASSUME FULL-FLOWING BOX   BOX-FLOW VELOCITY(FEET/SEC.) =  17.89
 BOX-FLOW(CFS) =     884.95
 BOX-FLOW TRAVEL TIME(MIN.) =   1.38    Tc(MIN.) =   35.62
 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.) =   35.62
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.629
 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       96.44      0.75     0.700    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B       25.64      0.75     0.600    56
 COMMERCIAL                 B        1.07      0.75     0.100    56
```



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 PUBLIC PARK                B        0.22      0.75     0.850    56
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 B        3.67      0.63     1.000    65
 SCHOOL                     B        0.34      0.75     0.600    56
 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= 0.41;30M= 0.83;1H= 1.09;3H= 1.85;6H= 2.58;24H= 5.11
 S-GRAPH: VALLEY(DEV.)= 99.3%;VALLEY(UNDEV.)/DESERT=  0.7%
          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
 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.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0366; Lca/L=0.4,n=.0328; Lca/L=0.5,n=.0302;Lca/L=0.6,n=.0281
 TIME OF PEAK FLOW(HR) = 16.50  RUNOFF VOLUME(AF) =     191.46
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =     932.15
 TOTAL AREA(ACRES) =      949.0       PEAK FLOW RATE(CFS) =     932.15

 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  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  54.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  36.20
 PIPE-FLOW(CFS) =     932.15
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 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  20825.00 TO NODE  20825.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   36.18
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.613
 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       10.70      0.75     0.600    56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B       31.03      0.75     0.700    56
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  AGRICULTURAL FAIR COVER
  "ORCHARDS"                B        0.52      0.63     1.000    65
  PUBLIC PARK               B        6.54      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) =      997.8
  LONGEST FLOWPATH FROM NODE  20800.00 TO NODE  20825.00 =   17342.38 FEET.
   EQUIVALENT 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      Fp         Ap     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"                 B        0.52      0.63     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
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  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      Fp         Ap     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= 0.41;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;
```

```
  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.
   EQUIVALENT 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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       24.73      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) =   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
```



```
  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  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         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= 0.41;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.
   EQUIVALENT 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 <<<<<
============================================================================
```

```
****************************************************************************
  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
```



```
  AREA-AVERAGED Fm(INCH/HR) =  0.52    Ybar = 0.56
  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
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```
  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 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
  "3-4 DWELLINGS/ACRE"       B        6.12      0.75     0.600    56   13.37
  COMMERCIAL                 B        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) =     22.45

  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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        7.31      0.75     0.600    56
  COMMERCIAL                 B        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) =   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
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  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) =   29.92
    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       23.09      0.75     0.600    56
  COMMERCIAL                 B        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) =   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<<<<<
```

```
  >>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
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   0.96    Tc(MIN.) =  12.44
  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.) =   12.44
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.062
  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        2.67      0.75     0.600    56
  MOBILE HOME PARK           B        3.54      0.75     0.250    56
  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) =   15.44
  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
  AREA-AVERAGED Ap =  0.45
  EFFECTIVE STREAM AREA(ACRES) =      57.40
  TOTAL STREAM AREA(ACRES) =      57.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     140.76

****************************************************************************
  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
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.021
  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
  "5-7 DWELLINGS/ACRE"       B        3.00      0.75     0.500    56   10.11
  COMMERCIAL                 B        5.71      0.75     0.100    56    7.90
  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) =     33.63
  TOTAL AREA(ACRES) =      9.80   PEAK FLOW RATE(CFS) =     33.63

  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        3.16      0.75     0.250    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        2.28      0.75     0.500    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.36      0.75     0.600    56
  COMMERCIAL                 B        1.50      0.75     0.100    56
  PUBLIC PARK                B        0.63      0.75     0.850    56
  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
```

```
  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
  CHANNEL FLOW THRU SUBAREA(CFS) =      60.02
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        4.09      0.75     0.250    56
  PUBLIC PARK                B        1.15      0.75     0.850    56
  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 =  0.386
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        2.82      0.75     0.250    56
  PUBLIC PARK                B        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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        0.75      0.75     0.250    56
  PUBLIC PARK                B        1.88      0.75     0.850    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.24      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.672
```

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  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        0.82      0.75     0.250    56
  PUBLIC PARK                B        2.06      0.75     0.850    56
  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 =  0.677
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        2.48      0.75     0.250    56
  PUBLIC PARK                B        2.79      0.75     0.850    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.16      0.75     0.600    56
  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) =      90.45

  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  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) =      90.45
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        0.62      0.75     0.250    56
  PUBLIC PARK                B        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) =   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) =      95.08
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK                B        1.44      0.75     0.850    56
  MOBILE HOME PARK           B        0.53      0.75     0.250    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.02      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) =    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      Fp         Ap     SCS
       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
  "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) =   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
```

```
INSIDE STREET CROSSFALL(DECIMAL) =  0.020
OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(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      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
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
```



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  HALFSTREET FLOOD WIDTH(FEET) =   35.71
  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      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) =   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
```

```
  EFFECTIVE STREAM AREA(ACRES) =     171.98
  TOTAL STREAM AREA(ACRES) =     171.98
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     277.33
  ** CONFLUENCE DATA **
  STREAM      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1      2305.79   38.48     2763.54    20620.00
     2       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= 0.99
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =     2992.9
  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 =  0.52
  PEAK FLOW RATE(CFS)   =   2498.67
============================================================================
============================================================================
  END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

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 ************************************************************************
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                          Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* REDLANDS MPD  - UPDATE                                                *
* REVISED RATIONAL METHOD 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
```



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 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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.372
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.580
  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
  ".4 DWELLING/ACRE"         B        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
  "2 DWELLINGS/ACRE"         B        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) =     28.78
  TOTAL AREA(ACRES) =     10.48   PEAK FLOW RATE(CFS) =     28.78

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.93; 1HR = 1.23; 3HR = 2.01; 6HR = 2.75; 24HR = 5.50

************************************************************************
  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)<<<<<
========================================================================
  UPSTREAM ELEVATION(FEET) = 1798.00  DOWNSTREAM ELEVATION(FEET) = 1770.00
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  STREET LENGTH(FEET) =   427.68   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 =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      35.57
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.45
    HALFSTREET FLOOD WIDTH(FEET) =   16.32
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.39
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.89
  STREET FLOW TRAVEL TIME(MIN.) =   1.11   Tc(MIN.) =   11.49
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.368
  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        2.43      0.75     0.900    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.53      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        2.46      0.75     0.700    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.780
  SUBAREA AREA(ACRES) =    5.42      SUBAREA RUNOFF(CFS) =   13.58
  EFFECTIVE AREA(ACRES) =     15.90    AREA-AVERAGED Fm(INCH/HR) =  0.55
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.73
  TOTAL AREA(ACRES) =       15.9        PEAK FLOW RATE(CFS) =      40.35

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

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.47   HALFSTREET FLOOD WIDTH(FEET) =  17.18
  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.

****************************************************************************
  FLOW PROCESS FROM NODE  20902.00 TO NODE  20903.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1770.00  DOWNSTREAM ELEVATION(FEET) = 1758.00
  STREET LENGTH(FEET) =   465.31   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

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



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  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      46.30
    ***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.) =    5.09
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.79
  STREET FLOW TRAVEL TIME(MIN.) =   1.52   Tc(MIN.) =   13.01
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.125
  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        2.12      0.75     0.900    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.54      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        2.53      0.75     0.700    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.771
  SUBAREA AREA(ACRES) =    5.19      SUBAREA RUNOFF(CFS) =   11.90
  EFFECTIVE AREA(ACRES) =     21.09    AREA-AVERAGED Fm(INCH/HR) =  0.56
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.74
  TOTAL AREA(ACRES) =       21.1        PEAK FLOW RATE(CFS) =      48.78

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

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.56   HALFSTREET FLOOD WIDTH(FEET) =  20.82
  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.

****************************************************************************
  FLOW PROCESS FROM NODE  20903.00 TO NODE  20904.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  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

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

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

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      71.72
   ***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.) =    4.96
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.29
 STREET FLOW TRAVEL TIME(MIN.) =   1.63   Tc(MIN.) =   14.64
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.911
 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        3.95      0.75     0.900    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        2.03      0.75     0.600    56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B       15.54      0.75     0.700    56
 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) =   45.85
 EFFECTIVE AREA(ACRES) =     42.61    AREA-AVERAGED Fm(INCH/HR) =  0.55
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.73
 TOTAL AREA(ACRES) =       42.6        PEAK FLOW RATE(CFS) =      90.57

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.46; 30M = 0.93; 1HR = 1.23; 3HR = 2.01; 6HR = 2.75; 24HR = 5.50

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.71   HALFSTREET FLOOD WIDTH(FEET) =  28.63
 FLOW VELOCITY(FEET/SEC.) =  5.29   DEPTH*VELOCITY(FT*FT/SEC.) =   3.77
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  486.2 FT WITH ELEVATION-DROP =   8.0 FT, IS   55.9 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
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   **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    56
 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***
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    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        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
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  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.66      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        8.47      0.75     0.700    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        0.16      0.63     1.000    65
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        7.50      0.75     0.900    56
  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 Tc :
  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
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  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      Fp         Ap      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"         B        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
```



```
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.349
  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        0.20      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        5.94      0.75     0.900    56
  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      Fp         Ap      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    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) =   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

****************************************************************************
```

```
  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) =      48.03
  FLOW VELOCITY(FEET/SEC.) =   3.40   FLOW DEPTH(FEET) =   0.53
  TRAVEL TIME(MIN.) =   2.42   Tc(MIN.) =   15.72
  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.) =   15.72
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.790
  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        8.27      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) =   16.98
  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) =      59.18

  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  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) =      59.18
  FLOW VELOCITY(FEET/SEC.) =   2.77   FLOW DEPTH(FEET) =   0.65
  TRAVEL TIME(MIN.) =   3.86   Tc(MIN.) =   19.58
  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.) =   19.58
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.445
  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        3.54      0.75     0.900    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.59      0.75     0.600    56
  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) =    6.71
  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
  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  20915.00 TO NODE  20916.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  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) =      75.93
    ***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.) =    6.20
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.84
  STREET FLOW TRAVEL TIME(MIN.) =   1.84   Tc(MIN.) =   21.42
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.317
  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        1.86      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       20.51      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) =   22.37      SUBAREA RUNOFF(CFS) =   33.48
  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) =      85.77

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

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.64   HALFSTREET FLOOD WIDTH(FEET) =  25.09
  FLOW VELOCITY(FEET/SEC.) =  6.44   DEPTH*VELOCITY(FT*FT/SEC.) =   4.13
  *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
  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 HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      99.87
    ***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.) =    8.04
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.01
  STREET FLOW TRAVEL TIME(MIN.) =   1.20   Tc(MIN.) =   22.61
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.243
  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        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) =   28.20
  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) =     110.13
```



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  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) =  25.09
  FLOW VELOCITY(FEET/SEC.) =  8.27   DEPTH*VELOCITY(FT*FT/SEC.) =   5.30
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         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
  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) =     123.60
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.78
    HALFSTREET FLOOD WIDTH(FEET) =   31.67
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.23
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.86
  STREET FLOW TRAVEL TIME(MIN.) =   1.95   Tc(MIN.) =   24.56
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.135
  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       12.63      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        5.91      0.75     0.900    56
  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) =   26.94
  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) =     129.58

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

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  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      Fp         Ap     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
  "ORCHARDS"                 B        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.

****************************************************************************
  FLOW PROCESS FROM NODE  20919.00 TO NODE  20920.00 IS CODE =  63
```



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----------------------------------------------------------------------------
  >>>>>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) =     165.93
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.82
    HALFSTREET 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         Ap     SCS
       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    56
  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 =  0.84
  TOTAL 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<<<<<
```

```
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  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
      2      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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        0.05      0.63     1.000    65
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       11.48      0.75     0.600    56
```



```
  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      Tc   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
      2      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
```

```
  LONGEST FLOWPATH FROM NODE  20910.00 TO NODE  20922.00 =    8456.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20922.00 TO NODE  20922.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   22.09
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.275
  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       10.56      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       31.42      0.75     0.700    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B       17.53      0.75     0.500    56
  MOBILE HOME PARK           B       16.71      0.75     0.250    56
  COMMERCIAL                 B        2.07      0.75     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.530
  SUBAREA AREA(ACRES) =   78.29      SUBAREA RUNOFF(CFS) =  132.35
  EFFECTIVE AREA(ACRES) =    355.77   AREA-AVERAGED Fm(INCH/HR) =  0.61
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =      402.4       PEAK FLOW RATE(CFS) =     531.46

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

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      555.80   22.18    2.269  0.74( 0.53) 0.72     355.8   20900.00
      2      476.15   30.95    1.858  0.74( 0.54) 0.73     402.4   20910.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     555.80  Tc(MIN.) =   22.18
  AREA-AVERAGED Fm(INCH/HR) =  0.53  AREA-AVERAGED Fp(INCH/HR) =  0.74
  AREA-AVERAGED Ap =  0.72  EFFECTIVE AREA(ACRES) =     355.77

****************************************************************************
  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
  USER SPECIFIED PIPE SYSTEM UNDER PRESSURE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  26.35
  PIPE-FLOW(CFS) =     517.82
  PIPEFLOW TRAVEL TIME(MIN.) =   0.95    Tc(MIN.) =  23.13
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.213
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```



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       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    56
  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) =   57.63
  EFFECTIVE AREA(ACRES) =    391.81    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) =     595.32

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

  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 Tc :
  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =   77.50
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.58
    HALFSTREET FLOOD WIDTH(FEET) =   22.16
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.34
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.28

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      595.32   23.13    2.213  0.74( 0.52) 0.70     391.8   20900.00
      2      510.59   31.79    1.829  0.74( 0.53) 0.72     438.5   20910.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     595.32  Tc(MIN.) =   23.13
  AREA-AVERAGED Fm(INCH/HR) =  0.52  AREA-AVERAGED Fp(INCH/HR) =  0.74
  AREA-AVERAGED Ap =  0.70  EFFECTIVE AREA(ACRES) =     391.81
  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
  *GIVEN BOX HEIGHT(FEET) =   4.00   ESTIMATED BOX BASEWIDTH(FEET) =    6.80
  ASSUME FULL-FLOWING BOX   BOX-FLOW VELOCITY(FEET/SEC.) =  21.89
  BOX-FLOW(CFS) =     595.32
  BOX-FLOW TRAVEL TIME(MIN.) =   1.03    Tc(MIN.) =   24.16
```

```
 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 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    56
 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) =     640.04

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

****************************************************************************
 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"       B        2.86      0.75     0.500    56
 SCHOOL                     B        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
```



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 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 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
 "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
```

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      22.12
    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) =      21.94

  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       12.11      0.75     0.600    56
  SCHOOL                     B       22.59      0.75     0.600    56
  PUBLIC PARK                B        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<<<<<
============================================================================
```

```
  MAINLINE Tc(MIN.) =   20.45
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.383
  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       26.74      0.75     0.600    56
  PUBLIC PARK                B        9.16      0.75     0.850    56
  SCHOOL                     B        6.76      0.75     0.600    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        6.64      0.63     1.000    65
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        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) =   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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       67.33      0.75     0.600    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        8.70      0.63     1.000    65
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B      101.89      0.75     0.600    56
  COMMERCIAL                 B        1.19      0.75     0.100    56
  MOBILE HOME PARK           B       18.61      0.75     0.250    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        2.78      0.75     0.500    56
  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
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        6.69      0.75     0.600    56
  MOBILE HOME PARK           B       28.27      0.75     0.250    56
  COMMERCIAL                 B        1.13      0.75     0.100    56
  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) =     549.60

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

****************************************************************************
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        3.30      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       20.77      0.75     0.600    56
  RESIDENTIAL
```



```
  "5-7 DWELLINGS/ACRE"       B       10.89      0.75     0.500    56
  MOBILE HOME PARK           B       29.98      0.75     0.250    56
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        6.87      0.75     0.500    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.91      0.75     0.600    56
  SCHOOL                     B        3.23      0.75     0.600    56
  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<<<<<
```

```
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   24.35
  RAINFALL INTENSITY(INCH/HR) =   2.15
  AREA-AVERAGED Fm(INCH/HR) =  0.40
  AREA-AVERAGED Fp(INCH/HR) =  0.74
  AREA-AVERAGED Ap =  0.54
  EFFECTIVE 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
      1      642.61   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     495.5   20910.00
      2      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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (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
      2     1272.53   25.15    2.105  0.74( 0.46) 0.62     859.8   20900.00
      3     1053.98   33.87    1.760  0.74( 0.47) 0.63     906.5   20910.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =    1283.44    Tc(MIN.) =    24.35
  EFFECTIVE AREA(ACRES) =     845.59   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= 0.46;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%
  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= 1.00
  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=.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
```



```
   (UPSTREAM NODE PEAK FLOW RATE(CFS) =   1283.44)
  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 =  0.014
  GIVEN 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(CFS) =    1283.44
  BOX-FLOW TRAVEL TIME(MIN.) =   2.59    Tc(MIN.) =   36.46
  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.) =   36.46
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.684
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  SCHOOL                     B       57.18      0.75      0.600    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       27.41      0.75      0.600    56
  MOBILE HOME PARK           B        4.75      0.75      0.250    56
  COMMERCIAL                 B        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
  SUBAREA AREA(ACRES) =   94.33
  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.)= 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= 1.00
  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=.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) =    1283.44
  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  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) =     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.
   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
  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
------------------------------------------------------------------------------
```

```
  >>>>>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 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.)
  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) =     18.50
  TOTAL AREA(ACRES) =      5.64   PEAK FLOW RATE(CFS) =     18.50

  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.46      0.75     0.600    56
  MOBILE HOME PARK           B        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) =     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
```



```
  FLOW VELOCITY(FEET/SEC.) =   6.74   DEPTH*VELOCITY(FT*FT/SEC) =   3.82
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.20      0.75     0.600    56
  MOBILE HOME PARK           B        1.83      0.75     0.250    56
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
```

```
  "3-4 DWELLINGS/ACRE"       B        3.52      0.75     0.600    56
  MOBILE HOME PARK           B        0.19      0.75     0.250    56
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK                B        0.07      0.75     0.850    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        7.87      0.75     0.600    56
  MOBILE HOME PARK           B        1.54      0.75     0.250    56
  COMMERCIAL                 B        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) =   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
  TOTAL AREA(ACRES) =       34.4       PEAK FLOW RATE(CFS) =      85.20

  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  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      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1      3254.49   39.87     3993.76    20620.00
     2        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
```

```
  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         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        5.80      0.75      0.600    56
  COMMERCIAL                 B       17.13      0.75      0.100    56
  PUBLIC PARK                B        0.39      0.75      0.850    56
  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
```

```
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =    10049.7
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  20956.00 =   36156.63 FEET.
   EQUIVALENT 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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.51      0.75     0.600    56
  COMMERCIAL                 B        3.07      0.75     0.100    56
  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      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        3.18      0.75     0.500    56   12.95
  COMMERCIAL                 B        4.70      0.75     0.100    56   10.12
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        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) =     26.99

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

****************************************************************************
  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
```

```
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      32.84
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.66
    HALFSTREET FLOOD WIDTH(FEET) =   26.01
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.30
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.52
  STREET FLOW TRAVEL TIME(MIN.) =   2.03   Tc(MIN.) =   12.15
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.256
  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        1.51      0.75     0.500    56
  COMMERCIAL                 B        2.33      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.44      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.293
  SUBAREA AREA(ACRES) =    4.28      SUBAREA RUNOFF(CFS) =   11.70
  EFFECTIVE AREA(ACRES) =     13.07    AREA-AVERAGED Fm(INCH/HR) =  0.22
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.30
  TOTAL AREA(ACRES) =       13.1        PEAK FLOW RATE(CFS) =      35.70

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

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.68   HALFSTREET FLOOD WIDTH(FEET) =  26.86
  FLOW VELOCITY(FEET/SEC.) =  2.35   DEPTH*VELOCITY(FT*FT/SEC.) =   1.59
  *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  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) =      40.40
    ***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.) =    2.18
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.60
  STREET FLOW TRAVEL TIME(MIN.) =   1.45   Tc(MIN.) =   13.60
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.043
  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
  COMMERCIAL                 B        1.91      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) =    9.39
  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) =      42.59

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

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.75   HALFSTREET FLOOD WIDTH(FEET) =  30.46
  FLOW VELOCITY(FEET/SEC.) =  2.21   DEPTH*VELOCITY(FT*FT/SEC.) =   1.65
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  189.1 FT WITH ELEVATION-DROP =   0.5 FT, IS   13.1 CFS,
         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.

****************************************************************************
  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) =      46.87
```

```
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.78
  HALFSTREET FLOOD WIDTH(FEET) =   32.05
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.20
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.72
 STREET FLOW TRAVEL TIME(MIN.) =   1.53   Tc(MIN.) =   15.12
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.855
 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        1.22      0.75     0.500    56
 COMMERCIAL                 B        1.94      0.75     0.100    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 =  0.298
 SUBAREA AREA(ACRES) =    3.61      SUBAREA RUNOFF(CFS) =    8.55
 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) =      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

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.79   HALFSTREET FLOOD WIDTH(FEET) =  32.42
 FLOW VELOCITY(FEET/SEC.) =  2.22   DEPTH*VELOCITY(FT*FT/SEC.) =   1.75
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        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  20964.00
 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
 STREET HALFWIDTH(FEET) = 18.00

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =      52.48
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.81
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  HALFSTREET FLOOD WIDTH(FEET) =   33.51
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.26
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.83
 STREET FLOW TRAVEL TIME(MIN.) =   1.49   Tc(MIN.) =   16.61
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.699
 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"       A        0.14      0.98     0.500    32
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"       B        1.29      0.75     0.500    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        0.85      0.75     0.600    56
 COMMERCIAL                 B        1.55      0.75     0.100    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.76
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.360
 SUBAREA AREA(ACRES) =    3.83      SUBAREA RUNOFF(CFS) =    8.36
 EFFECTIVE AREA(ACRES) =     24.22    AREA-AVERAGED Fm(INCH/HR) =  0.23
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.31
 TOTAL AREA(ACRES) =       24.2        PEAK FLOW RATE(CFS) =      53.80

 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) = 0.82   HALFSTREET FLOOD WIDTH(FEET) =  33.82
 FLOW VELOCITY(FEET/SEC.) =  2.28   DEPTH*VELOCITY(FT*FT/SEC.) =   1.86
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  201.6 FT WITH ELEVATION-DROP =   0.5 FT, IS   13.0 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE  20965.00
 LONGEST FLOWPATH FROM NODE  20960.00 TO NODE  20965.00 =    1808.10 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  20965.00 TO NODE  20966.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
 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) =      58.43
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.84
  HALFSTREET FLOOD WIDTH(FEET) =   35.16
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  AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.29
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.94
STREET FLOW TRAVEL TIME(MIN.) =   1.51   Tc(MIN.) =   18.12
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.562
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"       A        0.74      0.98     0.500    32
RESIDENTIAL
"5-7 DWELLINGS/ACRE"       B        0.93      0.75     0.500    56
COMMERCIAL                 B        2.70      0.75     0.100    56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.82
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.253
SUBAREA AREA(ACRES) =    4.37      SUBAREA RUNOFF(CFS) =    9.26
EFFECTIVE AREA(ACRES) =     28.59    AREA-AVERAGED Fm(INCH/HR) =  0.23
AREA-AVERAGED Fp(INCH/HR) =  0.76  AREA-AVERAGED Ap =  0.30
TOTAL AREA(ACRES) =       28.6        PEAK FLOW RATE(CFS) =      60.07

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

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.85   HALFSTREET FLOOD WIDTH(FEET) =  35.53
FLOW VELOCITY(FEET/SEC.) =  2.31   DEPTH*VELOCITY(FT*FT/SEC.) =   1.97
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L =  207.5 FT WITH ELEVATION-DROP =   0.5 FT, IS   15.0 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
 Manning's FRICTION FACTOR for Streetflow Section(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) =      66.33
   ***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.) =    2.54
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.17
 STREET FLOW TRAVEL TIME(MIN.) =   2.24   Tc(MIN.) =   20.35
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 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.389
 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"       A        2.02      0.98     0.500    32
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"       B        0.32      0.75     0.500    56
 COMMERCIAL                 A        0.04      0.98     0.100    32
 COMMERCIAL                 B        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) =   12.52
 EFFECTIVE AREA(ACRES) =     35.00    AREA-AVERAGED Fm(INCH/HR) =  0.23
 AREA-AVERAGED Fp(INCH/HR) =  0.78  AREA-AVERAGED Ap =  0.29
 TOTAL AREA(ACRES) =       35.0        PEAK FLOW RATE(CFS) =      68.14

 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) = 0.86   HALFSTREET FLOOD WIDTH(FEET) =  35.96
 FLOW VELOCITY(FEET/SEC.) =  2.56   DEPTH*VELOCITY(FT*FT/SEC.) =   2.20
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  341.5 FT WITH ELEVATION-DROP =   1.0 FT, IS   19.8 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  23.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  12.11
 PIPE-FLOW(CFS) =      68.14
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME(MIN.) =   2.54    Tc(MIN.) =  22.89
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.227
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B       13.57      0.75     0.100    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        3.04      0.75     0.600    56
 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) =   31.15
 EFFECTIVE AREA(ACRES) =     51.61    AREA-AVERAGED Fm(INCH/HR) =  0.20
 AREA-AVERAGED Fp(INCH/HR) =  0.77  AREA-AVERAGED Ap =  0.26
 TOTAL AREA(ACRES) =       51.6        PEAK FLOW RATE(CFS) =      94.17
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  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) =   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      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1      6046.33   47.77    10055.32    20120.00
     2        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
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  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
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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
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             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 21070                     *
* 100-YR  HC ULTIMATE CONDITION    OCT 2013   DMALOTT                   *
 ************************************************************************

  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
     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
```



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 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 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
  "3-4 DWELLINGS/ACRE"       B        5.92      0.75      0.600    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
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  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      25.99
    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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
  FLOW VELOCITY(FEET/SEC.) =   6.26   FLOW DEPTH(FEET) =   1.09
  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
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  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.629
  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        7.03      0.75     0.600    56
  SCHOOL                     B        7.98      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) =   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 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
  "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
```

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****************************************************************************
  FLOW PROCESS FROM NODE  21011.00 TO NODE  21012.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1462.00  DOWNSTREAM ELEVATION(FEET) = 1440.00
  STREET LENGTH(FEET) =   809.73   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) =   0.83

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      23.08
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.45
    HALFSTREET FLOOD WIDTH(FEET) =   16.40
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.11
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.87
  STREET FLOW TRAVEL TIME(MIN.) =   3.28   Tc(MIN.) =   15.91
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.772
  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        4.37      0.75     0.600    56
  SCHOOL                     B        1.10      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) =    5.47      SUBAREA RUNOFF(CFS) =   11.44
  EFFECTIVE AREA(ACRES) =     12.52    AREA-AVERAGED Fm(INCH/HR) =  0.45
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.60
  TOTAL AREA(ACRES) =       12.5        PEAK FLOW RATE(CFS) =      26.18

  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) = 0.47   HALFSTREET FLOOD WIDTH(FEET) =  17.26
  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.

****************************************************************************
  FLOW PROCESS FROM NODE  21012.00 TO NODE  21013.00 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) =   312.07   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00
```



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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      28.76
    ***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.) =    4.08
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.02
  STREET FLOW TRAVEL TIME(MIN.) =   1.27   Tc(MIN.) =   17.19
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.647
  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        0.66      0.75     0.600    56
  SCHOOL                     B        1.95      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) =    2.61      SUBAREA RUNOFF(CFS) =    5.16
  EFFECTIVE AREA(ACRES) =     15.13    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) =      29.93

  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 STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.50   HALFSTREET FLOOD WIDTH(FEET) =  18.01
  FLOW VELOCITY(FEET/SEC.) =  4.14   DEPTH*VELOCITY(FT*FT/SEC.) =   2.07
  LONGEST FLOWPATH FROM NODE  21010.00 TO NODE  21013.00 =    2033.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21013.00 TO NODE  21013.00 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.) =   17.19
  RAINFALL INTENSITY(INCH/HR) =   2.65
  AREA-AVERAGED Fm(INCH/HR) =  0.45
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.60
  EFFECTIVE STREAM AREA(ACRES) =      15.13
  TOTAL STREAM AREA(ACRES) =      15.13
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      29.93
```

```
 ** 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.

 ** 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
 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.

****************************************************************************
 FLOW PROCESS FROM NODE  21013.00 TO NODE  21014.00 IS CODE =  54
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 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
 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 **
  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:
 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

****************************************************************************
 FLOW PROCESS FROM NODE  21014.00 TO NODE  21014.00 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
```



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 "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

 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  21014.00 TO NODE  21015.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
 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
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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
   ***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.) =    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):
  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
 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
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.55
 TOTAL AREA(ACRES) =       80.6        PEAK FLOW RATE(CFS) =     128.84

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
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  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.74   HALFSTREET FLOOD WIDTH(FEET) =  30.04
  FLOW VELOCITY(FEET/SEC.) =  6.86   DEPTH*VELOCITY(FT*FT/SEC.) =   5.08
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1339.5 FT WITH ELEVATION-DROP =  35.0 FT, IS   35.9 CFS,
         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  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) =     136.12
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.84
    HALFSTREET FLOOD WIDTH(FEET) =   34.80
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.46
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.56
  STREET FLOW TRAVEL TIME(MIN.) =   2.89   Tc(MIN.) =   26.42
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.045
  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        1.76      0.75     0.600    56
  SCHOOL                     B        3.85      0.75     0.600    56
  MOBILE HOME PARK           B        2.60      0.75     0.250    56
  PUBLIC PARK                B        0.44      0.75     0.850    56
  COMMERCIAL                 B        0.91      0.75     0.100    56
  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) =   14.57
  EFFECTIVE AREA(ACRES) =     89.83    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) =     132.79

  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) = 0.83   HALFSTREET FLOOD WIDTH(FEET) =  34.49
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  FLOW VELOCITY(FEET/SEC.) =  5.41   DEPTH*VELOCITY(FT*FT/SEC.) =   4.49
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  945.3 FT WITH ELEVATION-DROP =  13.0 FT, IS   26.6 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE  21032.00
  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.) =   26.42
  RAINFALL INTENSITY(INCH/HR) =   2.04
  AREA-AVERAGED Fm(INCH/HR) =  0.40
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.54
  EFFECTIVE STREAM AREA(ACRES) =      89.83
  TOTAL STREAM AREA(ACRES) =      90.17
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     132.79

****************************************************************************
  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
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.837
  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
  "3-4 DWELLINGS/ACRE"       B        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) =     14.34
  TOTAL AREA(ACRES) =      6.20   PEAK FLOW RATE(CFS) =     14.34

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

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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      Fp         Ap     SCS
       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) =      25.31

  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) = 0.44   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
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    **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
       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    56
  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
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 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.631
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 MOBILE HOME PARK           B        6.35      0.75     0.250    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        0.47      0.75     0.600    56
 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
 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) =      55.87

 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) = 0.52   HALFSTREET FLOOD WIDTH(FEET) =  19.05
 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.

****************************************************************************
 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) =   0.70

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      63.20
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.58
   HALFSTREET FLOOD WIDTH(FEET) =   22.16
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.99
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.49
 STREET FLOW TRAVEL TIME(MIN.) =   1.09   Tc(MIN.) =   18.45
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.536
 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        4.17      0.75     0.600    56
 MOBILE HOME PARK           B        3.23      0.75     0.250    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
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 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.447
 SUBAREA AREA(ACRES) =    7.40      SUBAREA RUNOFF(CFS) =   14.66
 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) =      68.34

 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) = 0.60   HALFSTREET FLOOD WIDTH(FEET) =  22.83
 FLOW VELOCITY(FEET/SEC.) =  6.12   DEPTH*VELOCITY(FT*FT/SEC.) =   3.65
 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) =   0.70

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      71.61
   ***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.) =    4.68
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.18
 STREET FLOW TRAVEL TIME(MIN.) =   1.27   Tc(MIN.) =   19.72
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.437
 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        1.32      0.75     0.600    56
 COMMERCIAL                 B        1.20      0.75     0.100    56
 MOBILE HOME PARK           B        0.81      0.75     0.250    56
 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) =    6.55
 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) =      71.91

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.67      0.75     0.600    56
  COMMERCIAL                 B        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) =   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.

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  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) =      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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.72      0.75     0.600    56
  COMMERCIAL                 B        2.05      0.75     0.100    56
  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) =    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
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  STREET HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      92.77
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.72
    HALFSTREET FLOOD WIDTH(FEET) =   28.88
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.33
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.82
  STREET FLOW TRAVEL TIME(MIN.) =   0.94   Tc(MIN.) =   22.53
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.250
  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        2.13      0.75     0.600    56
  COMMERCIAL                 B        2.11      0.75     0.100    56
  MOBILE HOME PARK           B        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) =    9.24
  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) =      94.88

  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) =  29.12
  FLOW VELOCITY(FEET/SEC.) =  5.36   DEPTH*VELOCITY(FT*FT/SEC.) =   3.87
  LONGEST FLOWPATH FROM NODE  21020.00 TO NODE  21029.00 =    3156.87 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
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  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        9.68      0.75     0.100    56
  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) =   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<<<<<
============================================================================
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```
  MAINLINE Tc(MIN.) =   23.79
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.177
  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        2.14      0.75     0.600    56
  COMMERCIAL                 B        3.35      0.75     0.100    56
  SCHOOL                     B        0.63      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.326
  SUBAREA AREA(ACRES) =    6.12      SUBAREA RUNOFF(CFS) =   10.65
  EFFECTIVE AREA(ACRES) =     98.68   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.39
  TOTAL AREA(ACRES) =       98.7       PEAK FLOW RATE(CFS) =     167.70

  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  21032.00 TO NODE  21032.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   23.79
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.177
  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        0.62      0.75     0.600    56
  SCHOOL                     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) =    1.89      SUBAREA RUNOFF(CFS) =    2.94
  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) =     170.64

  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  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.) =   23.79
  RAINFALL INTENSITY(INCH/HR) =   2.18
  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 =     170.64
```



```
  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      132.79   26.42    2.045  0.75( 0.40) 0.54      89.8   21010.00
      1      132.53   26.62    2.035  0.75( 0.40) 0.54      90.2   21000.00
      2      170.64   23.79    2.177  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)     Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      299.88   23.79    2.177  0.75( 0.34) 0.46     181.5   21020.00
      2      291.41   26.42    2.045  0.75( 0.34) 0.46     190.4   21010.00
      3      290.32   26.62    2.035  0.75( 0.34) 0.46     190.7   21000.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     299.88    Tc(MIN.) =    23.79
  EFFECTIVE AREA(ACRES) =     181.46   AREA-AVERAGED Fm(INCH/HR) =  0.34
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.46
  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  1.77 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  15.36
  BOX-FLOW(CFS) =     299.88
  BOX-FLOW TRAVEL TIME(MIN.) =   0.38    Tc(MIN.) =   24.18
  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.) =   24.18
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.157
  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        2.84      0.75     0.600    56
  SCHOOL                     B        2.77      0.75     0.600    56
  COMMERCIAL                 B        2.00      0.75     0.100    56
  MOBILE HOME PARK           B        6.89      0.75     0.250    56
  PUBLIC PARK                B        1.56      0.75     0.850    56
  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) =   26.72
```

```
  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
      1      323.39   24.16    2.158  0.75( 0.34) 0.45     197.5   21020.00
      2      313.54   26.77    2.029  0.75( 0.34) 0.46     206.5   21010.00
      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 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        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) =     31.28
  TOTAL AREA(ACRES) =     11.28   PEAK FLOW RATE(CFS) =     31.28

  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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.00      0.75     0.600    56
  COMMERCIAL                 B        5.39      0.75     0.100    56
  SCHOOL                     B        1.37      0.75     0.600    56
  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) =      53.31

  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) = 0.62   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
```

```
----------------------------------------------------------------------------
  >>>>>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  1.00 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  10.62
  BOX-FLOW(CFS) =      53.31
  BOX-FLOW TRAVEL TIME(MIN.) =   1.41    Tc(MIN.) =   15.96
  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.) =   15.96
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.767
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       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
  SCHOOL                     B        2.94      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.590
  SUBAREA AREA(ACRES) =    5.56      SUBAREA RUNOFF(CFS) =   11.64
  EFFECTIVE AREA(ACRES) =     27.60   AREA-AVERAGED Fm(INCH/HR) =  0.28
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.37
  TOTAL AREA(ACRES) =       27.6       PEAK FLOW RATE(CFS) =      61.83

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

****************************************************************************
  FLOW PROCESS FROM NODE  21043.00 TO NODE  21043.00 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.) =   15.96
  RAINFALL INTENSITY(INCH/HR) =   2.77
  AREA-AVERAGED Fm(INCH/HR) =  0.28
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.37
  EFFECTIVE STREAM AREA(ACRES) =      27.60
  TOTAL STREAM AREA(ACRES) =      27.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      61.83

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   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
      1      313.54   26.77    2.029  0.75( 0.34) 0.46     206.5   21010.00
```



```
      1      312.50   26.95    2.020  0.75( 0.34) 0.46     206.8   21000.00
      2       61.83   15.96    2.767  0.75( 0.28) 0.37      27.6   21040.00

  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      347.00   15.96    2.767  0.75( 0.33) 0.44     158.1   21040.00
      2      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
      4      355.77   26.95    2.020  0.75( 0.33) 0.45     234.4   21000.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     370.07    Tc(MIN.) =    24.16
  EFFECTIVE AREA(ACRES) =     225.12   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  21043.00 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) =  1327.00  DOWNSTREAM(FEET) =  1318.00
  FLOW LENGTH(FEET) =   665.51   MANNING'S N =  0.014
  GIVEN BOX BASEWIDTH(FEET) =  12.00   GIVEN BOX HEIGHT(FEET) =   2.50
  *GIVEN BOX HEIGHT(FEET) =   2.50   ESTIMATED BOX BASEWIDTH(FEET) =   12.64
  ASSUME FULL-FLOWING BOX   BOX-FLOW VELOCITY(FEET/SEC.) =  11.71
  BOX-FLOW(CFS) =     370.07
  BOX-FLOW TRAVEL TIME(MIN.) =   0.95    Tc(MIN.) =   25.10
  LONGEST FLOWPATH FROM NODE  21000.00 TO NODE  21044.00 =    7328.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21044.00 TO NODE  21044.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   25.10
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.108
  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        4.70      0.75     0.600    56
  COMMERCIAL                 B       13.39      0.75     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.230
  SUBAREA AREA(ACRES) =   18.09      SUBAREA RUNOFF(CFS) =   31.53
  EFFECTIVE AREA(ACRES) =    243.21   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) =     391.62

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

```
  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      377.91   16.67    2.696  0.75( 0.31) 0.42     176.1   21040.00
      2      394.82   24.82    2.123  0.75( 0.32) 0.43     243.2   21020.00
      3      380.83   27.41    2.000  0.75( 0.32) 0.43     252.1   21010.00
      4      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
```



```
  FLOWDEPTH IN BOX IS  7.42 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  35.44
  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
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      377.91   16.67    2.696  0.75( 0.31) 0.42     176.1   21040.00
      2      394.82   24.82    2.123  0.75( 0.32) 0.43     243.2   21020.00
      3      380.83   27.41    2.000  0.75( 0.32) 0.43     252.1   21010.00
      4      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.
   EQUIVALENT 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
```

```
  CHANNEL FLOW THRU SUBAREA(CFS) =    6141.10
  FLOW VELOCITY(FEET/SEC.) =  33.09   FLOW DEPTH(FEET) =   6.59
  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  21045.00 TO NODE  21045.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   49.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.411
  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"       A       25.15      0.98     0.500    32
  COMMERCIAL                 A       34.08      0.98     0.100    32
  SCHOOL                     A        9.02      0.98     0.600    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        6.36      0.98     0.600    32
  COMMERCIAL                 B       60.62      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       23.64      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.87
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.286
  SUBAREA AREA(ACRES) =  158.87
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.44;30M= 0.90;1H= 1.18;3H= 1.97;6H= 2.72;24H= 6.12
  S-GRAPH: VALLEY(DEV.)= 70.3%;VALLEY(UNDEV.)/DESERT= 29.7%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.82; LAG(HR) = 0.65; 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) =    10518.3
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21045.00 =   39604.08 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) = 16.67  RUNOFF VOLUME(AF) =    2658.39
  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 = 5.50

****************************************************************************
  FLOW PROCESS FROM NODE  21045.00 TO NODE  21046.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1295.00  DOWNSTREAM(FEET) =   1250.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2744.77   CHANNEL SLOPE =  0.0164
  CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   7.50
  CHANNEL FLOW THRU SUBAREA(CFS) =    6166.87
  FLOW VELOCITY(FEET/SEC.) =  32.99   FLOW DEPTH(FEET) =   6.62
```



```
  TRAVEL TIME(MIN.) =   1.39   Tc(MIN.) =   50.39
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21046.00 =   42348.85 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21046.00 TO NODE  21046.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   50.39
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.388
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A       22.52      0.98     0.100    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        7.83      0.98     0.600    32
  COMMERCIAL                 B       38.49      0.75     0.100    56
  PUBLIC PARK                A        8.61      0.98     0.850    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.45      0.75     0.600    56
  MOBILE HOME PARK           B        0.52      0.75     0.250    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.90
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.254
  SUBAREA AREA(ACRES) =   82.42
  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.)= 70.6%;VALLEY(UNDEV.)/DESERT= 29.4%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.84; LAG(HR) = 0.67; 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) =    10600.7
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21046.00 =   42348.85 FEET.
   EQUIVALENT 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=.0197
  TIME OF PEAK FLOW(HR) = 16.75  RUNOFF VOLUME(AF) =    2685.67
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    6087.60
  TOTAL AREA(ACRES) =    10600.7       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 = 2.03; 6HR = 2.75; 24HR = 5.47

****************************************************************************
  FLOW PROCESS FROM NODE  21046.00 TO NODE  21069.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>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
  CHANNEL BASE(FEET) =   18.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   9.00
  CHANNEL FLOW THRU SUBAREA(CFS) =    6166.87
  FLOW VELOCITY(FEET/SEC.) =  29.88   FLOW DEPTH(FEET) =   6.61
  TRAVEL TIME(MIN.) =   1.52   Tc(MIN.) =   51.91
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21069.00 =   45066.88 FEET.
```

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****************************************************************************
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        5.29      0.75     0.600    56
  COMMERCIAL                 B       24.38      0.75     0.100    56
  COMMERCIAL                 A        9.45      0.98     0.100    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        1.36      0.98     0.600    32
  PUBLIC PARK                A        5.30      0.98     0.850    32
  PUBLIC PARK                B        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.
   EQUIVALENT 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
```



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  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.396
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.802
  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
  "5-7 DWELLINGS/ACRE"       A        2.98      0.98     0.500    32   12.02
  COMMERCIAL                 A        5.49      0.98     0.100    32    9.40
  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) =      43.15
    ***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         Ap     SCS
       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) =   26.97
```

```
  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) =      53.91

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.38; 6HR = 1.88; 24HR = 3.38

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.64   HALFSTREET FLOOD WIDTH(FEET) =  25.09
  FLOW VELOCITY(FEET/SEC.) =  4.05   DEPTH*VELOCITY(FT*FT/SEC.) =   2.60
  *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  21051.00 TO NODE  21052.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  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) =      80.81
    ***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.) =    4.74
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.37
  STREET FLOW TRAVEL TIME(MIN.) =   2.66   Tc(MIN.) =   13.56
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.051
  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"       A        1.87      0.98     0.500    32
  COMMERCIAL                 A       17.40      0.98     0.100    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        1.43      0.98     0.600    32
  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) =   53.74
  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) =     100.48
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  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 4.96

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.76   HALFSTREET FLOOD WIDTH(FEET) =  31.13
  FLOW VELOCITY(FEET/SEC.) =  4.99   DEPTH*VELOCITY(FT*FT/SEC.) =   3.81
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  756.6 FT WITH ELEVATION-DROP =  10.0 FT, IS   64.2 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
  STREET LENGTH(FEET) =  1432.84   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =     146.88
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.89
    HALFSTREET FLOOD WIDTH(FEET) =   37.42
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.11
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.54
  STREET FLOW TRAVEL TIME(MIN.) =   4.67   Tc(MIN.) =   18.23
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.554
  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"       A       17.32      0.98     0.500    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.30      0.75     0.600    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        5.92      0.75     0.500    56
  COMMERCIAL                 B        6.47      0.75     0.100    56
  COMMERCIAL                 A       13.55      0.98     0.100    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        1.00      0.98     0.600    32
  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) =   92.47
  EFFECTIVE AREA(ACRES) =     84.91    AREA-AVERAGED Fm(INCH/HR) =  0.26
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 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 Tc :
 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 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
 "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                 A        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):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"       A        1.79      0.98     0.500    32
 COMMERCIAL                 A        7.48      0.98     0.100    32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A        1.27      0.98     0.600    32
```

```
  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) =      36.98

  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A        1.53      0.98     0.500    32
  COMMERCIAL                 A        4.98      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
```



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  EFFECTIVE AREA(ACRES) =     27.21    AREA-AVERAGED Fm(INCH/HR) =  0.22
  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     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A        4.16      0.98     0.500    32
  COMMERCIAL                 A        5.34      0.98     0.100    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        0.77      0.98     0.600    32
  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
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A        4.73      0.98     0.500    32
  COMMERCIAL                 A        3.54      0.98     0.100    32
  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.

****************************************************************************
```



```
  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) =      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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        2.04      0.98     0.600    32
  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
```

```
 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) =      80.62
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.76
   HALFSTREET FLOOD WIDTH(FEET) =   30.88
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.28
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.27
 STREET FLOW TRAVEL TIME(MIN.) =   3.35   Tc(MIN.) =   34.63
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.738
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B        1.85      0.75     0.100    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        0.05      0.75     0.600    56
 COMMERCIAL                 A        0.62      0.98     0.100    32
 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) =    3.74
 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) =      78.75
 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 = 5.15

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.76   HALFSTREET FLOOD WIDTH(FEET) =  30.64
 FLOW VELOCITY(FEET/SEC.) =  4.25   DEPTH*VELOCITY(FT*FT/SEC.) =   3.22
 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<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   34.63
 RAINFALL INTENSITY(INCH/HR) =   1.74
 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
```



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 PEAK FLOW RATE(CFS) AT CONFLUENCE =      78.75

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      200.78   14.87    2.887  0.93( 0.26) 0.28      84.9   21050.00
     2       78.75   34.63    1.738  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      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      260.72   14.87    2.887  0.94( 0.26) 0.27     109.6   21050.00
     2      191.74   34.63    1.738  0.95( 0.26) 0.27     142.5   21060.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     260.72    Tc(MIN.) =    14.87
 EFFECTIVE AREA(ACRES) =     109.64   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
 USER SPECIFIED PIPE SYSTEM UNDER PRESSURE
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.59
 PIPE-FLOW(CFS) =     253.73
 PIPEFLOW TRAVEL TIME(MIN.) =   3.41    Tc(MIN.) =  18.28
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.551
 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        7.32      0.98     0.600    32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        5.09      0.75     0.600    56
 COMMERCIAL                 A       15.30      0.98     0.100    32
 COMMERCIAL                 B       41.62      0.75     0.100    56
 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) =  149.10
 EFFECTIVE AREA(ACRES) =    178.97    AREA-AVERAGED Fm(INCH/HR) =  0.22
 AREA-AVERAGED Fp(INCH/HR) =  0.91  AREA-AVERAGED Ap =  0.24
 TOTAL AREA(ACRES) =      211.9        PEAK FLOW RATE(CFS) =     375.34

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.00; 6HR = 2.69; 24HR = 4.84
```

```
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
*NOTE: STREET-CAPACITY MAY BE EXCEEDED*
STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =  121.61
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  1.12
  HALFSTREET FLOOD WIDTH(FEET) =   61.64
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.20
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.47

*DEFICIENCY ANALYSIS(BASED ON REPLACEMENT SYSTEM HYDROLOGY):
*REPLACEMENT PIPE SYSTEM (MANNING'S N = .0050):
ESTIMATED PIPE DIAMETER(INCH) =  60.00    NUMBER OF PIPES =   1
DEPTH OF FLOW IN  60.0 INCH PIPE IS  47.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =  15.63
PIPE-FLOW(CFS) =     260.72
PIPEFLOW TRAVEL TIME(MIN.) =   1.44    Tc(MIN.) =  16.30
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.732
SUBAREA AREA(ACRES) =   69.33      SUBAREA RUNOFF(CFS) =  160.39
TOTAL AREA(ACRES) =      211.9        PEAK FLOW RATE(CFS) =     404.49
*NOTE: STREET-CAPACITY MAY BE EXCEEDED*
STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =  143.77
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  1.17
  HALFSTREET FLOOD WIDTH(FEET) =   64.39
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.31
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.72

*PARALLEL PIPE SYSTEM (MANNING'S N = .0130):
PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L =  1347.9 FT WITH ELEVATION-DROP =   2.5 FT, IS  144.9 CFS,
       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE  21068.00

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      404.49   16.30    2.732  0.91( 0.22) 0.24     179.0   21050.00
    2      271.85   37.73    1.651  0.92( 0.23) 0.24     211.9   21060.00
NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) =     404.49  Tc(MIN.) =   16.30
AREA-AVERAGED Fm(INCH/HR) =  0.22  AREA-AVERAGED Fp(INCH/HR) =  0.91
AREA-AVERAGED Ap =  0.24  EFFECTIVE AREA(ACRES) =     178.97
LONGEST FLOWPATH FROM NODE  21060.00 TO NODE  21068.00 =    5875.96 FEET.
```



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****************************************************************************
  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 =  0.013

  USER SPECIFIED PIPE DIAMETER(INCH) =  93.00    NUMBER OF PIPES =   1
  USER SPECIFIED PIPE SYSTEM UNDER PRESSURE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.64
  PIPE-FLOW(CFS) =     360.86
  PIPEFLOW TRAVEL TIME(MIN.) =   2.50    Tc(MIN.) =  18.81
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.507
  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        1.21      0.75     0.600    56
  COMMERCIAL                 A       33.09      0.98     0.100    32
  PUBLIC PARK                B        0.04      0.75     0.850    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.93
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.118
  SUBAREA AREA(ACRES) =   34.34      SUBAREA RUNOFF(CFS) =   74.08
  EFFECTIVE AREA(ACRES) =    213.31    AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.92  AREA-AVERAGED Ap =  0.26
  TOTAL AREA(ACRES) =      246.2        PEAK FLOW RATE(CFS) =     435.02

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.88; 6HR = 2.44; 24HR = 4.76

  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
  *NOTE: STREET-CAPACITY MAY BE EXCEEDED*
  STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =   74.15
    ***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.) =    2.00
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.92

  *DEFICIENCY ANALYSIS(BASED ON REPLACEMENT SYSTEM HYDROLOGY):
  *REPLACEMENT PIPE SYSTEM (MANNING'S N = .0050):
  ESTIMATED PIPE DIAMETER(INCH) =  69.00    NUMBER OF PIPES =   1
  DEPTH OF FLOW IN  69.0 INCH PIPE IS  53.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.59
```

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  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 Tc :
  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
      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
  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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     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;
```



```
  3HR = 0.94; 6HR = 0.97; 24HR= 0.98
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =    10893.4
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21069.00 =   45066.88 FEET.
   EQUIVALENT 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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B      108.13      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       17.27      0.75     0.600    56
  PUBLIC PARK                B        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= 0.44;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
```

```
  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) =    6262.02
  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  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 =  0.50
  PEAK FLOW RATE(CFS)   =   6262.02
============================================================================
============================================================================
  END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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             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 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:  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
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 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  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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.418
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.797
  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
  "3-4 DWELLINGS/ACRE"       B        0.91      0.75     0.600    56    9.42
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        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) =     22.07
  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

************************************************************************
  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
```

```
  MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      22.07
  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      Fp         Ap     SCS
       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    56
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.23      0.75     0.600    56
  RESIDENTIAL
```



```
  "2 DWELLINGS/ACRE"         B        8.43      0.75     0.700    56
  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) =   22.13
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       20.18      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.62      0.75     0.600    56
  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
```

```
  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) =     117.96
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.76
    HALFSTREET FLOOD WIDTH(FEET) =   30.88
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.26
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.78
  STREET FLOW TRAVEL TIME(MIN.) =   1.07   Tc(MIN.) =   16.36
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.726
  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        2.78      0.75     0.700    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.85      0.75     0.500    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.653
  SUBAREA AREA(ACRES) =    3.63      SUBAREA RUNOFF(CFS) =    7.31
  EFFECTIVE AREA(ACRES) =     58.19    AREA-AVERAGED Fm(INCH/HR) =  0.51
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.68
  TOTAL AREA(ACRES) =       58.2        PEAK FLOW RATE(CFS) =     116.06

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

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.76   HALFSTREET FLOOD WIDTH(FEET) =  30.70
  FLOW VELOCITY(FEET/SEC.) =  6.23   DEPTH*VELOCITY(FT*FT/SEC.) =   4.74
  LONGEST FLOWPATH FROM NODE  21100.00 TO NODE  21105.00 =    2989.90 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21105.00 TO NODE  21106.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 18 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1705.00  DOWNSTREAM ELEVATION(FEET) = 1690.00
  STREET LENGTH(FEET) =   562.31   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
```



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  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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         Ap     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    56
  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***
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```
  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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B       28.69      0.75     0.700    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        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) =   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
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SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(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      Fp         Ap     SCS
     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 Tc :
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
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  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.21
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) =     231.33
  ***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      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
RESIDENTIAL
"2 DWELLINGS/ACRE"         B        6.59      0.75     0.700    56
RESIDENTIAL
"3-4 DWELLINGS/ACRE"       B        1.29      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) =    7.88      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
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  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      Fp         Ap     SCS
       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
```



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****************************************************************************
  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      Fp         Ap     SCS   Tc
       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
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    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.67
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.53
  STREET FLOW TRAVEL TIME(MIN.) =   3.88   Tc(MIN.) =   15.13
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.856
  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        0.67      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       10.86      0.75     0.700    56
  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) =   24.25
  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) =      38.97

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.38; 6HR = 1.87; 24HR = 3.39

  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
  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) =      68.27
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.57
    HALFSTREET FLOOD WIDTH(FEET) =   21.74
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.71
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.85
  STREET FLOW TRAVEL TIME(MIN.) =   4.63   Tc(MIN.) =   19.77
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.434
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
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  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) =   58.27
  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) =      90.20

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.89; 24HR = 3.41

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.62   HALFSTREET FLOOD WIDTH(FEET) =  24.12
  FLOW VELOCITY(FEET/SEC.) =  7.30   DEPTH*VELOCITY(FT*FT/SEC.) =   4.54
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         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
  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) =      94.11
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.58
    HALFSTREET FLOOD WIDTH(FEET) =   21.86
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    9.15
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.28
  STREET FLOW TRAVEL TIME(MIN.) =   0.86   Tc(MIN.) =   20.63
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.372
  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        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) =    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) =      99.83
    ***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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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 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        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
```

```
  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) =      27.55
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.41
    HALFSTREET FLOOD WIDTH(FEET) =   14.05
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.58
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.68
  STREET FLOW TRAVEL TIME(MIN.) =   1.67   Tc(MIN.) =   15.99
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.764
  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       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) =      38.93

  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 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
```



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  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      49.90
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.51
    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
  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) =   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
  STREET HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      65.10
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.61
  HALFSTREET FLOOD WIDTH(FEET) =   23.32
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.61
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.40
 STREET FLOW TRAVEL TIME(MIN.) =   2.40   Tc(MIN.) =   20.22
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.401
 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        7.02      0.75     0.700    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        1.50      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) =    8.52      SUBAREA RUNOFF(CFS) =   14.50
 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) =      67.05

 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) = 0.61   HALFSTREET FLOOD WIDTH(FEET) =  23.63
 FLOW VELOCITY(FEET/SEC.) =  5.64   DEPTH*VELOCITY(FT*FT/SEC.) =   3.45
 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.) =   20.22
 RAINFALL INTENSITY(INCH/HR) =   2.40
 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 =      67.05

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      100.76   21.75    2.298  0.75( 0.51) 0.69      62.7   21121.00
     2       67.05   20.22    2.401  0.73( 0.52) 0.72      39.7   21150.00

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

 ** PEAK FLOW RATE TABLE **
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  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      166.11   20.22    2.401  0.74( 0.52) 0.70      98.0   21150.00
     2      164.13   21.75    2.298  0.74( 0.52) 0.70     102.4   21121.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     166.11    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
 TOTAL AREA(ACRES) =      102.4
 LONGEST FLOWPATH FROM NODE  21121.00 TO NODE  21126.00 =    5128.21 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  21126.00 TO NODE  21127.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
 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

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =     168.51
  ***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.) =    8.63
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.50
 STREET FLOW TRAVEL TIME(MIN.) =   0.62   Tc(MIN.) =   20.84
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.358
 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        2.16      0.75     0.700    56
 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) =    4.80
 EFFECTIVE AREA(ACRES) =    100.88    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) =     167.09

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.34; 6HR = 1.79; 24HR = 3.39
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       10.17      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       45.95      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) =   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
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      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     SCS
       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
```

```
  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
      2      267.41   24.02    2.165  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       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      263.55   20.95    2.350  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
      1      533.83   20.95    2.350  0.75( 0.51) 0.68     321.6   21100.00
      2      524.35   22.48    2.253  0.75( 0.51) 0.68     333.5   21150.00
      3      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
  PIPE-FLOW(CFS) =     533.83
  *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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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) =  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      Fp         Ap     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"                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) =     624.71

  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 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
  "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      Fp         Ap     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) =   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
```

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  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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         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) =   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) =      32.88

  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
```



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    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      Fp         Ap     SCS
       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) =   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) =      41.85
  *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      Fp         Ap     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:
```

```
  CURB HEIGHT(INCHES) =  6.0       STREET HALFWIDTH(FEET) = 18.00
  DISTANCE FROM CROWN TO 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
    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.

****************************************************************************
  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  24.0 INCHES
  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
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       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) =      71.15
  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

  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
```



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  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<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   19.05
  RAINFALL INTENSITY(INCH/HR) =   2.49
  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 =      71.15

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      623.12   23.65    2.185  0.75( 0.49) 0.66     409.5   21100.00
      1      610.26   25.20    2.104  0.75( 0.49) 0.66     421.4   21150.00
      1      587.97   26.76    2.029  0.75( 0.49) 0.66     425.8   21121.00
      2       71.15   19.05    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.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      662.88   19.05    2.488  0.75( 0.49) 0.65     366.9   21140.00
      2      683.77   23.65    2.185  0.75( 0.49) 0.66     446.7   21100.00
      3      668.09   25.20    2.104  0.75( 0.49) 0.66     458.6   21150.00
      4      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.) =    23.65
  EFFECTIVE AREA(ACRES) =     446.73   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
  CHANNEL FLOW THRU SUBAREA(CFS) =     683.77
  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 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        8.73      0.61     1.000    66   17.34
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.90      0.75     0.600    56   10.12
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        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
  TOTAL AREA(ACRES) =      9.81   PEAK FLOW RATE(CFS) =     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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       15.02      0.61     1.000    66
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        4.09      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        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) =   47.29
  EFFECTIVE 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.) =   14.25
  LONGEST 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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       17.09      0.61     1.000    66
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        4.24      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.47      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) =   21.80      SUBAREA RUNOFF(CFS) =   46.47
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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.30      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       39.32      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        7.87      0.61     1.000    66
  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
```



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

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(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         Ap     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) =   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***
```

```
    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         Ap     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 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
  "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
```

```
------------------------------------------------------------------------------
  >>>>>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         Ap     SCS
       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

******************************************************************************
```



```
  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.) =   13.38
  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
      2       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       Q      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
      2      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
```

```
  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      Fp         Ap     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"                 B        1.74      0.63     1.000    65
  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)     Ap     Ae     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
```



```
  LONGEST FLOWPATH FROM NODE  21154.00 TO NODE  21165.00 =    7499.85 FEET.

****************************************************************************
  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
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  SCHOOL                     B        1.72      0.75     0.600    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       10.42      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) =   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 =  0.73
  TOTAL 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)     Ap     Ae     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
      2      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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     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
      2      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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      662.88   19.66    2.441  0.75( 0.49) 0.65     366.9   21140.00
      2      683.77   24.26    2.152  0.75( 0.49) 0.66     446.7   21100.00
      3      668.09   25.81    2.073  0.75( 0.49) 0.66     458.6   21150.00
      4      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 **
```

```
 STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
    1      932.33   14.49    2.932  0.73( 0.49) 0.68     417.6   21160.00
    2      982.50   19.66    2.441  0.73( 0.50) 0.68     551.1   21140.00
    3      985.44   20.35    2.391  0.73( 0.50) 0.68     568.0   21154.00
    4      962.46   24.26    2.152  0.73( 0.50) 0.68     635.8   21100.00
    5      933.45   25.81    2.073  0.73( 0.50) 0.68     647.7   21150.00
    6      896.30   27.38    2.001  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) =      985.44  Tc(MIN.) =   20.354
  EFFECTIVE AREA(ACRES) =    568.01  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
----------------------------------------------------------------------------
  >>>>>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= 0.88;1H= 1.16;3H= 1.87;6H= 2.53;24H= 5.01
  S-GRAPH: VALLEY(DEV.)= 91.4%;VALLEY(UNDEV.)/DESERT=  8.6%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.40; LAG(HR) = 0.32; Fm(INCH/HR) = 0.50; 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) =  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=.0332; Lca/L=0.4,n=.0298; Lca/L=0.5,n=.0273;Lca/L=0.6,n=.0255
  TIME OF PEAK FLOW(HR) = 16.42  RUNOFF VOLUME(AF) =     147.25
  UNIT-HYDROGRAPH METHOD PEAK FLOW RATE(CFS) =    919.45
  TOTAL PEAK FLOW RATE(CFS) =    919.45 (SOURCE FLOW INCLUDED)
  RATIONAL METHOD PEAK FLOW RATE(CFS) =    985.44
   (UPSTREAM NODE PEAK FLOW RATE(CFS) =    985.44)
  PEAK FLOW RATE(CFS) USED =    985.44

****************************************************************************
  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  58.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  34.03
  PIPE-FLOW(CFS) =     985.44
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   0.53    Tc(MIN.) =  24.80
  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.) =   24.80
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.124
  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       28.30      0.75     0.600    56
  SCHOOL                     B       18.42      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) =   46.72
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.43;30M= 0.88;1H= 1.16;3H= 1.88;6H= 2.55;24H= 5.04
  S-GRAPH: VALLEY(DEV.)= 92.0%;VALLEY(UNDEV.)/DESERT=  8.0%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.41; LAG(HR) = 0.33; Fm(INCH/HR) = 0.49; 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) =  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=.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 PEAK FLOW RATE(CFS) =     981.26
  TOTAL AREA(ACRES) =      698.8       PEAK FLOW RATE(CFS) =     985.44
  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  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  63.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  31.57
  PIPE-FLOW(CFS) =     985.44
```

```
  *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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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.
   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=.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.) =     25.49
  AREA-AVERAGED Fm(INCH/HR)=  0.49   Ybar =  0.53
  PEAK FLOW RATE(CFS)   =   1031.19
============================================================================
============================================================================
  END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

```
 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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                          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
  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)    (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
```



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 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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.219
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.843
  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.)
  SCHOOL                     B        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
  "2 DWELLINGS/ACRE"         B        4.38      0.75     0.700    56    9.80
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.673
  SUBAREA RUNOFF(CFS) =     18.09
  TOTAL AREA(ACRES) =      6.02   PEAK FLOW RATE(CFS) =     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
```

```
  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) =      22.19
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.44
    HALFSTREET FLOOD WIDTH(FEET) =   14.02
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.15
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.26
  STREET FLOW TRAVEL TIME(MIN.) =   0.79   Tc(MIN.) =   10.01
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.658
  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        1.00      0.75     0.600    56
  SCHOOL                     B        1.16      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        0.69      0.75     0.700    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.624
  SUBAREA AREA(ACRES) =    2.85      SUBAREA RUNOFF(CFS) =    8.19
  EFFECTIVE AREA(ACRES) =      8.87    AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.66
  TOTAL AREA(ACRES) =        8.9        PEAK FLOW RATE(CFS) =      25.28

  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) = 0.45   HALFSTREET FLOOD WIDTH(FEET) =  14.84
  FLOW VELOCITY(FEET/SEC.) =  5.29   DEPTH*VELOCITY(FT*FT/SEC.) =   2.40
  LONGEST FLOWPATH FROM NODE  21200.00 TO NODE  21202.00 =     813.59 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21202.00 TO NODE  21203.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 18 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1695.00  DOWNSTREAM ELEVATION(FEET) = 1675.00
  STREET LENGTH(FEET) =   482.35   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) =   0.77

    **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      Fp         Ap     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) =   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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      59.22
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.58
```

```
  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         Ap     SCS
     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        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) =   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) =      65.18

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      Fp         Ap     SCS
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     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   HALFSTREET FLOOD WIDTH(FEET) =  29.17
  FLOW VELOCITY(FEET/SEC.) =  4.65   DEPTH*VELOCITY(FT*FT/SEC.) =   3.40
  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) =      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
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  SUBAREA AREA(ACRES) =    5.38      SUBAREA RUNOFF(CFS) =   11.30
  EFFECTIVE AREA(ACRES) =     41.46    AREA-AVERAGED Fm(INCH/HR) =  0.51
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.68
  TOTAL AREA(ACRES) =       41.5        PEAK FLOW RATE(CFS) =      87.07

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

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.73   HALFSTREET FLOOD WIDTH(FEET) =  28.93
  FLOW VELOCITY(FEET/SEC.) =  5.27   DEPTH*VELOCITY(FT*FT/SEC.) =   3.82
  LONGEST FLOWPATH FROM NODE  21200.00 TO NODE  21206.00 =    2574.90 FEET.

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  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) =      93.43
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.70
    HALFSTREET FLOOD WIDTH(FEET) =   27.58
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.23
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.35
  STREET FLOW TRAVEL TIME(MIN.) =   1.63   Tc(MIN.) =   16.88
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.674
  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        5.03      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 AREA(ACRES) =    6.52      SUBAREA RUNOFF(CFS) =   12.72
  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) =      93.53

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
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  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.70   HALFSTREET FLOOD WIDTH(FEET) =  27.58
  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.

****************************************************************************
  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) =     100.90
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.70
    HALFSTREET FLOOD WIDTH(FEET) =   27.46
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.79
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.72
  STREET FLOW TRAVEL TIME(MIN.) =   1.31   Tc(MIN.) =   18.18
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.556
  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        6.92      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.09      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) =    8.01      SUBAREA RUNOFF(CFS) =   14.73
  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) =     103.20

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

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.70   HALFSTREET FLOOD WIDTH(FEET) =  27.64
  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.

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 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)<<<<<
============================================================================
 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) =     106.67
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.67
   HALFSTREET FLOOD WIDTH(FEET) =   25.38
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    8.04
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.35
 STREET FLOW TRAVEL TIME(MIN.) =   1.40   Tc(MIN.) =   19.59
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.445
 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        0.99      0.75     0.600    56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        2.98      0.75     0.700    56
 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) =    6.93
 EFFECTIVE AREA(ACRES) =     59.96    AREA-AVERAGED Fm(INCH/HR) =  0.51
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.68
 TOTAL AREA(ACRES) =       60.0        PEAK FLOW RATE(CFS) =     104.51

 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) = 0.66   HALFSTREET FLOOD WIDTH(FEET) =  25.15
 FLOW VELOCITY(FEET/SEC.) =  8.02   DEPTH*VELOCITY(FT*FT/SEC.) =   5.30
 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
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 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 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 =  0.600
 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 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.)
 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) =     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
```

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****************************************************************************
  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) =      39.68
    ***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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  SCHOOL                     B        3.65      0.75     0.600    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.28      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       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 =  0.64
  TOTAL AREA(ACRES) =       29.9        PEAK FLOW RATE(CFS) =      50.85

  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) =  0.55
    HALFSTREET 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         Ap     SCS
       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    56
  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 =  0.66
  TOTAL 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
----------------------------------------------------------------------------
```

```
  >>>>>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 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        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) =     13.42
  TOTAL AREA(ACRES) =      5.34   PEAK FLOW RATE(CFS) =     13.42

  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  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      Fp         Ap     SCS
       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
```



```
  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  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      Fp         Ap     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    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) =   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
```

```
****************************************************************************
  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
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.369
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.581
  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.)
  PUBLIC PARK                B        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) =      9.76
  TOTAL AREA(ACRES) =      3.60   PEAK FLOW RATE(CFS) =      9.76

  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  21213.00 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) =      14.39
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.42
    HALFSTREET FLOOD WIDTH(FEET) =   14.60
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.20
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.34
  STREET FLOW TRAVEL TIME(MIN.) =   4.92   Tc(MIN.) =   15.29
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.836
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```



```
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK                B        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) =    9.21
  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) =      16.56

  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) = 0.43   HALFSTREET FLOOD WIDTH(FEET) =  15.38
  FLOW VELOCITY(FEET/SEC.) =  3.33   DEPTH*VELOCITY(FT*FT/SEC.) =   1.45
  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.) =   15.29
  RAINFALL INTENSITY(INCH/HR) =   2.84
  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 =      16.56

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       39.70   15.34    2.831  0.75( 0.52) 0.69      19.1   21210.00
      2       16.56   15.29    2.836  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      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       56.22   15.29    2.836  0.75( 0.53) 0.70      27.0   21213.10
      2       56.22   15.34    2.831  0.75( 0.53) 0.70      27.1   21210.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      56.22    Tc(MIN.) =    15.29
  EFFECTIVE AREA(ACRES) =      27.05   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
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   1.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      56.22
  FLOW VELOCITY(FEET/SEC.) =   6.05   FLOW DEPTH(FEET) =   0.96
  TRAVEL TIME(MIN.) =   1.60   Tc(MIN.) =   16.89
  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.) =   16.89
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.672
  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        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) =    9.01
  EFFECTIVE AREA(ACRES) =     31.69   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) =      61.23

  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  21214.00 TO NODE  21214.00 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       61.23   16.89    2.672  0.75( 0.52) 0.70      31.7   21213.10
      2       61.22   16.94    2.667  0.75( 0.52) 0.70      31.8   21210.00
  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
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       65.51   25.88    2.069  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      120.36   16.89    2.672  0.75( 0.51) 0.68      61.8   21213.10
      2      120.39   16.94    2.667  0.75( 0.51) 0.68      62.0   21210.00
      3      109.63   25.88    2.069  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) =      120.39  Tc(MIN.) =   16.944
  EFFECTIVE AREA(ACRES) =     61.98  AREA-AVERAGED Fm(INCH/HR) =  0.51
  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 #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1540.00  DOWNSTREAM ELEVATION(FEET) = 1520.00
  STREET LENGTH(FEET) =   601.35   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) =   0.70

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     129.12
    ***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.) =    7.51
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.36
  STREET FLOW TRAVEL TIME(MIN.) =   1.34   Tc(MIN.) =   18.28
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.549
  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"       B        0.90      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        8.64      0.75     0.700    56
  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) =   17.45
  EFFECTIVE AREA(ACRES) =     71.52    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) =     131.22

  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) = 0.72   HALFSTREET FLOOD WIDTH(FEET) =  28.88
  FLOW VELOCITY(FEET/SEC.) =  7.54   DEPTH*VELOCITY(FT*FT/SEC.) =   5.41

  *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.) =  31.51
  PIPE-FLOW(CFS) =      99.09
  PIPEFLOW TRAVEL TIME(MIN.) =   0.32    Tc(MIN.) =  17.26
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.638
  SUBAREA AREA(ACRES) =    9.54      SUBAREA RUNOFF(CFS) =   18.21
  TOTAL AREA(ACRES) =       87.5        PEAK FLOW RATE(CFS) =     136.95

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.39; 6HR = 1.90; 24HR = 3.54
  STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =   37.87
    ***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.) =    5.12
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.59

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      136.96   17.21    2.642  0.75( 0.51) 0.68      71.4   21213.10
      2      136.95   17.26    2.638  0.75( 0.51) 0.68      71.5   21210.00
      3      121.77   26.19    2.054  0.75( 0.51) 0.68      87.5   21213.30
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     136.96  Tc(MIN.) =   17.21
  AREA-AVERAGED Fm(INCH/HR) =  0.51  AREA-AVERAGED Fp(INCH/HR) =  0.75
  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  21215.00 TO NODE  21215.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 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      136.96   17.21    2.642  0.75( 0.51) 0.68      71.4   21213.10
      2      136.95   17.26    2.638  0.75( 0.51) 0.68      71.5   21210.00
      3      121.77   26.19    2.054  0.75( 0.51) 0.68      87.5   21213.30
  LONGEST FLOWPATH FROM NODE  21213.30 TO NODE  21215.00 =    5452.99 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   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
  LONGEST FLOWPATH FROM NODE  21200.00 TO NODE  21215.00 =    5371.61 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      242.62   17.21    2.642  0.75( 0.51) 0.68     126.2   21213.10
      2      242.70   17.26    2.638  0.75( 0.51) 0.68     126.6   21210.00
      3      241.80   20.55    2.375  0.75( 0.51) 0.68     142.9   21200.00
      4      213.24   26.19    2.054  0.75( 0.51) 0.68     153.0   21213.30
    TOTAL AREA(ACRES) =       153.0

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      242.70  Tc(MIN.) =   17.262
  EFFECTIVE AREA(ACRES) =    126.56  AREA-AVERAGED Fm(INCH/HR) =  0.51
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.68
  TOTAL AREA(ACRES) =      153.0
  LONGEST FLOWPATH FROM NODE  21213.30 TO NODE  21215.00 =    5452.99 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21215.00 TO NODE  21215.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  21215.00 TO NODE  21216.00 IS CODE =  48
----------------------------------------------------------------------------
  >>>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1520.00  DOWNSTREAM(FEET) =  1470.00
  FLOW LENGTH(FEET) =  1371.54   MANNING'S N =  0.014
  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
  BOX-FLOW(CFS) =     242.70
  BOX-FLOW TRAVEL TIME(MIN.) =   1.04    Tc(MIN.) =   18.30
  LONGEST FLOWPATH FROM NODE  21213.30 TO NODE  21216.00 =    6824.53 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21216.00 TO NODE  21216.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   18.30
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.547
  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       23.70      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) =   23.70      SUBAREA RUNOFF(CFS) =   44.75
EFFECTIVE AREA(ACRES) =    150.26   AREA-AVERAGED Fm(INCH/HR) =  0.50
AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.67
TOTAL AREA(ACRES) =      176.7       PEAK FLOW RATE(CFS) =     277.12

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

** PEAK FLOW RATE TABLE **
 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
    2      277.78   18.19    2.556  0.75( 0.50) 0.67     149.9   21213.10
    3      272.78   21.43    2.317  0.75( 0.50) 0.67     166.6   21200.00
    4      241.20   27.05    2.014  0.75( 0.50) 0.67     176.7   21213.30
NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) =     277.78  Tc(MIN.) =   18.19
AREA-AVERAGED Fm(INCH/HR) =  0.50  AREA-AVERAGED Fp(INCH/HR) =  0.75
AREA-AVERAGED Ap =  0.67  EFFECTIVE AREA(ACRES) =     149.94

****************************************************************************
FLOW PROCESS FROM NODE  21216.00 TO NODE  21217.00 IS CODE =  48
----------------------------------------------------------------------------
>>>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =  1470.00  DOWNSTREAM(FEET) =  1415.00
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  1.70 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  23.42
BOX-FLOW(CFS) =     278.39
BOX-FLOW TRAVEL TIME(MIN.) =   0.96    Tc(MIN.) =   19.15
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.) =   19.15
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.478
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       12.77      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) =   12.77      SUBAREA RUNOFF(CFS) =   23.33
EFFECTIVE AREA(ACRES) =    162.71   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) =     290.46

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



```
** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      291.77   19.05    2.486  0.75( 0.49) 0.66     162.7   21213.10
    2      291.79   19.10    2.483  0.75( 0.49) 0.66     163.0   21210.00
    3      285.92   22.24    2.265  0.75( 0.49) 0.66     179.4   21200.00
    4      253.19   27.86    1.979  0.75( 0.49) 0.66     189.5   21213.30
NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) =     291.77  Tc(MIN.) =   19.05
AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.75
AREA-AVERAGED Ap =  0.66  EFFECTIVE AREA(ACRES) =     162.71

****************************************************************************
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  1.74 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  20.91
BOX-FLOW(CFS) =     291.79
BOX-FLOW TRAVEL TIME(MIN.) =   1.52    Tc(MIN.) =   20.57
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.) =   20.57
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.374
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       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) =   34.19
EFFECTIVE AREA(ACRES) =    182.44   AREA-AVERAGED Fm(INCH/HR) =  0.49
AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.65
TOTAL AREA(ACRES) =      209.2       PEAK FLOW RATE(CFS) =     309.39

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

** PEAK FLOW RATE TABLE **
 STREAM       Q      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      310.44   20.49    2.380  0.75( 0.49) 0.65     182.4   21213.10
    3      304.56   23.55    2.189  0.75( 0.49) 0.65     199.1   21200.00
    4      270.42   29.15    1.926  0.75( 0.49) 0.65     209.2   21213.30
NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) =     310.44  Tc(MIN.) =   20.49
```

```
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.65  EFFECTIVE AREA(ACRES) =     182.44

****************************************************************************
  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
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.537
  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.)
  PUBLIC PARK                B        8.02      0.75     0.850    56   12.41
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        0.68      0.75     0.700    56   11.25
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        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) =     23.56
  TOTAL AREA(ACRES) =      8.98   PEAK FLOW RATE(CFS) =     23.56

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

****************************************************************************
  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) =      23.56
  FLOW VELOCITY(FEET/SEC.) =   3.29   FLOW DEPTH(FEET) =   0.38
  TRAVEL TIME(MIN.) =   3.71   Tc(MIN.) =   14.29
  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.) =   14.29
```



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  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.954
  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        0.88      0.75     0.600    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        9.97      0.63     1.000    65
  PUBLIC PARK                B        3.94      0.75     0.850    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        2.50      0.75     0.700    56
  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) =   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
  TOTAL AREA(ACRES) =       26.3       PEAK FLOW RATE(CFS) =      55.38

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

****************************************************************************
  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
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      67.62
    ***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.) =    6.15
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.65
  STREET FLOW TRAVEL TIME(MIN.) =   1.29   Tc(MIN.) =   15.59
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.804
  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       11.55      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) =   11.55      SUBAREA RUNOFF(CFS) =   24.49
```

```
  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) =      76.32

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

  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      Fp         Ap     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
  "ORCHARDS"                 B        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) =   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
```



```
  END OF SUBAREA STREET FLOW HYDRAULICS:
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        3.82      0.75     0.600    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        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) =    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) =     104.44

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

  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.
```

```
****************************************************************************
  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):
   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    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) =     128.88

  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.) =    9.384
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.802
  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
  "3-4 DWELLINGS/ACRE"       B        4.58      0.75     0.600    56    9.38
  SCHOOL                     B        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) =     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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.65      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) =    4.65      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
```

```
  TOTAL AREA(ACRES) =        9.3        PEAK FLOW RATE(CFS) =      23.14

  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) = 0.48   HALFSTREET FLOOD WIDTH(FEET) =  16.19
  FLOW VELOCITY(FEET/SEC.) =  4.12   DEPTH*VELOCITY(FT*FT/SEC.) =   1.99
  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) =      33.10
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.61
    HALFSTREET FLOOD WIDTH(FEET) =   22.51
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.15
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.92
  STREET FLOW TRAVEL TIME(MIN.) =   3.53   Tc(MIN.) =   16.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.760
  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        9.55      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) =    9.55      SUBAREA RUNOFF(CFS) =   19.87
  EFFECTIVE AREA(ACRES) =     18.88    AREA-AVERAGED Fm(INCH/HR) =  0.45
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.60
  TOTAL AREA(ACRES) =       18.9        PEAK FLOW RATE(CFS) =      39.27

  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) = 0.64   HALFSTREET FLOOD WIDTH(FEET) =  24.07
  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.
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  21233.00 TO NODE  21233.00 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.) =   16.00
  RAINFALL INTENSITY(INCH/HR) =   2.76
  AREA-AVERAGED Fm(INCH/HR) =  0.45
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.60
  EFFECTIVE STREAM AREA(ACRES) =      18.88
  TOTAL STREAM AREA(ACRES) =      18.88
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      39.27

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      128.88   19.98    2.416  0.71( 0.53) 0.74      75.8   21220.00
      2       39.27   16.00    2.760  0.75( 0.45) 0.60      18.9   21230.00

  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      161.30   16.00    2.760  0.72( 0.51) 0.71      79.6   21230.00
      2      162.30   19.98    2.416  0.72( 0.51) 0.71      94.7   21220.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     162.30    Tc(MIN.) =    19.98
  EFFECTIVE AREA(ACRES) =      94.67   AREA-AVERAGED Fm(INCH/HR) =  0.51
  AREA-AVERAGED Fp(INCH/HR) =  0.72  AREA-AVERAGED Ap =  0.71
  TOTAL AREA(ACRES) =       94.7
  LONGEST FLOWPATH FROM NODE  21220.00 TO NODE  21233.00 =    4438.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21233.00 TO NODE  21234.00 IS CODE =  48
----------------------------------------------------------------------------
  >>>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1423.00  DOWNSTREAM(FEET) =  1373.00
  FLOW LENGTH(FEET) =  1343.35   MANNING'S N =  0.014
  GIVEN BOX BASEWIDTH(FEET) =   8.00   GIVEN BOX HEIGHT(FEET) =   1.50
  FLOWDEPTH IN BOX IS  1.10 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  18.51
  BOX-FLOW(CFS) =     162.30
  BOX-FLOW TRAVEL TIME(MIN.) =   1.21    Tc(MIN.) =   21.19
  LONGEST FLOWPATH FROM NODE  21220.00 TO NODE  21234.00 =    5781.89 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21234.00 TO NODE  21234.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
```

```
 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         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 MOBILE HOME PARK           B        8.16      0.75     0.250    56
 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
```



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 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       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      234.28   18.15    2.559  0.73( 0.47) 0.65     124.6   21230.00
     2      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
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      234.28   18.67    2.516  0.73( 0.47) 0.65     124.6   21230.00
     2      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       Q      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      310.44   20.49    2.380  0.75( 0.49) 0.65     182.4   21213.10
     3      304.56   23.55    2.189  0.75( 0.49) 0.65     199.1   21200.00
     4      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 **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  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
     3      541.10   20.49    2.380  0.74( 0.48) 0.65     314.1   21213.10
```

```
      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
  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.

****************************************************************************
  FLOW PROCESS FROM NODE  21236.00 TO NODE  21236.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  21236.00 TO NODE  21246.00 IS CODE =  48
----------------------------------------------------------------------------
  >>>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT)<<<<<
============================================================================
  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.

****************************************************************************
  FLOW PROCESS FROM NODE  21246.00 TO NODE  21246.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   21.90
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.287
  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
  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
  TOTAL AREA(ACRES) =      406.2       PEAK FLOW RATE(CFS) =     613.51

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

  ** PEAK FLOW RATE TABLE **
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   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
  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  21246.00 TO NODE 212146.00 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) =  0.45
  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  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
  * 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.)
  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):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50

****************************************************************************
  FLOW PROCESS FROM NODE  21241.00 TO NODE  21242.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
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  >>>>>(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) =      33.78
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.51
    HALFSTREET FLOOD WIDTH(FEET) =   17.47
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.21
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.64
  STREET FLOW TRAVEL TIME(MIN.) =   4.32   Tc(MIN.) =   15.05
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.864
  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       13.82      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) =   13.82      SUBAREA RUNOFF(CFS) =   30.04
  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) =      44.78

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

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.55   HALFSTREET FLOOD WIDTH(FEET) =  19.58
  FLOW VELOCITY(FEET/SEC.) =  5.56   DEPTH*VELOCITY(FT*FT/SEC.) =   3.06
  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
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  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       14.61      0.75     0.600    56
  COMMERCIAL                 B        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,
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        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) =      87.88
    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      Fp         Ap     SCS
       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) =   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
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  TOTAL AREA(ACRES) =       50.0        PEAK FLOW RATE(CFS) =     102.45

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
  STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       11.63      0.75     0.600    56
  SCHOOL                     B        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) =   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
```

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  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.74   HALFSTREET FLOOD WIDTH(FEET) =  29.90
  FLOW VELOCITY(FEET/SEC.) =  6.80   DEPTH*VELOCITY(FT*FT/SEC.) =   5.06
  ** 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.) =  30.60
  PIPE-FLOW(CFS) =      96.22
  PIPEFLOW TRAVEL TIME(MIN.) =   0.73    Tc(MIN.) =  17.09
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.654
  SUBAREA AREA(ACRES) =   16.96      SUBAREA RUNOFF(CFS) =   33.66
  TOTAL AREA(ACRES) =       67.0        PEAK FLOW RATE(CFS) =     132.94

  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) =   36.72
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.54
    HALFSTREET FLOOD WIDTH(FEET) =   18.88
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.89
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.62
  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)<<<<<
============================================================================
  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

  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) =     140.09
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.82
    HALFSTREET FLOOD WIDTH(FEET) =   33.87
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.17
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.08
  STREET FLOW TRAVEL TIME(MIN.) =   2.54   Tc(MIN.) =   19.63
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.442
  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        2.70      0.75     0.600    56
```



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  MOBILE HOME PARK           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) =   14.30
  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) =     134.48

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

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.82   HALFSTREET FLOOD WIDTH(FEET) =  33.44
  FLOW VELOCITY(FEET/SEC.) =  6.07   DEPTH*VELOCITY(FT*FT/SEC.) =   4.95
  ** 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.) =  26.58
  PIPE-FLOW(CFS) =     105.77
  PIPEFLOW TRAVEL TIME(MIN.) =   0.59    Tc(MIN.) =  17.68
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.600
  SUBAREA AREA(ACRES) =    7.36      SUBAREA RUNOFF(CFS) =   15.35
  TOTAL AREA(ACRES) =       74.3        PEAK FLOW RATE(CFS) =     145.07

  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) =   39.30
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.58
    HALFSTREET FLOOD WIDTH(FEET) =   21.17
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.21
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.45
  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.) =   17.68
  RAINFALL INTENSITY(INCH/HR) =   2.60
  AREA-AVERAGED Fm(INCH/HR) =  0.43
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.58
  EFFECTIVE STREAM AREA(ACRES) =      74.32
  TOTAL STREAM AREA(ACRES) =      74.32
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     145.07

  ** CONFLUENCE DATA **
   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
      1      617.37   21.70    2.299  0.74( 0.45) 0.61     371.5   21213.10
      1      616.76   21.75    2.296  0.74( 0.45) 0.61     371.7   21210.00
```

```
     1      606.87   23.68    2.182  0.74( 0.46) 0.62     390.6   21220.00
     1      596.94   24.64    2.130  0.74( 0.46) 0.62     396.1   21200.00
     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

  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      740.72   17.68    2.600  0.74( 0.45) 0.60     382.0   21240.00
     2      748.50   20.03    2.412  0.74( 0.45) 0.60     423.0   21230.00
     3      742.30   21.70    2.299  0.74( 0.45) 0.61     445.8   21213.10
     4      741.50   21.75    2.296  0.74( 0.45) 0.61     446.0   21210.00
     5      723.96   23.68    2.182  0.74( 0.45) 0.61     464.9   21220.00
     6      710.59   24.64    2.130  0.74( 0.45) 0.61     470.5   21200.00
     7      619.09   30.23    1.885  0.74( 0.45) 0.61     480.5   21213.30

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     748.50    Tc(MIN.) =    20.03
  EFFECTIVE AREA(ACRES) =     423.00   AREA-AVERAGED Fm(INCH/HR) =  0.45
  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  21246.00 TO NODE  21247.00 IS CODE =  48
----------------------------------------------------------------------------
  >>>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1311.00  DOWNSTREAM(FEET) =  1290.00
  FLOW LENGTH(FEET) =  1258.84   MANNING'S N =  0.014
  GIVEN BOX BASEWIDTH(FEET) =  12.00   GIVEN BOX HEIGHT(FEET) =   4.00
  FLOWDEPTH IN BOX IS  2.91 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  21.44
  BOX-FLOW(CFS) =     748.50
  BOX-FLOW TRAVEL TIME(MIN.) =   0.98    Tc(MIN.) =   21.01
  LONGEST FLOWPATH FROM NODE  21213.30 TO NODE  21247.00 =   13319.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21247.00 TO NODE  21247.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   21.01
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.344
  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       23.54      0.75     0.600    56
  COMMERCIAL                 B        1.26      0.75     0.100    56
  MOBILE HOME PARK           B        0.22      0.75     0.250    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        1.80      0.63     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.73
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.600
```



```
  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
     2      771.36   20.90    2.351  0.74( 0.45) 0.60     449.8   21230.00
     3      765.37   22.53    2.248  0.74( 0.45) 0.61     472.6   21213.10
     4      765.68   22.53    2.248  0.74( 0.45) 0.61     472.8   21210.00
     5      748.08   24.43    2.141  0.74( 0.45) 0.61     491.7   21220.00
     6      735.14   25.35    2.094  0.74( 0.45) 0.61     497.3   21200.00
     7      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) =     449.82

****************************************************************************
  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 <<<<<
============================================================================
```

```
****************************************************************************
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        0.01      0.75     0.250    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        7.68      0.75     0.600    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        2.53      0.63     1.000    65
  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 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       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
      2      771.36   20.90    2.351  0.74( 0.45) 0.60     449.8   21230.00
      3      765.37   22.53    2.248  0.74( 0.45) 0.61     472.6   21213.10
      4      765.68   22.53    2.248  0.74( 0.45) 0.61     472.8   21210.00
      5      748.08   24.43    2.141  0.74( 0.45) 0.61     491.7   21220.00
      6      735.14   25.35    2.094  0.74( 0.45) 0.61     497.3   21200.00
      7      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
  FLOW VELOCITY(FEET/SEC.) =  26.60   FLOW DEPTH(FEET) =   3.81
  TRAVEL TIME(MIN.) =   0.28   Tc(MIN.) =   26.55
```

```
  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
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B       37.17      0.75     0.250    56
  COMMERCIAL                 B       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= 0.43;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.
   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) = 16.42  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.) =     26.55
  AREA-AVERAGED Fm(INCH/HR)=  0.46   Ybar =  0.50
  PEAK FLOW RATE(CFS)   =   1796.65
============================================================================
============================================================================
  END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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             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 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

  *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
```



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 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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.326
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.593
  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   10.98
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        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) =     14.40
  TOTAL AREA(ACRES) =      5.18   PEAK FLOW RATE(CFS) =     14.40

  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  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
```

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =      17.48
   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      Fp         Ap     SCS
      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) =      19.79

 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) = 0.46   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
```



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 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         Ap     SCS
      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    56
 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
```

```
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.87
  STREET FLOW TRAVEL TIME(MIN.) =   0.42   Tc(MIN.) =   12.52
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.200
  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        1.38      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 =  0.675
  SUBAREA AREA(ACRES) =    1.83      SUBAREA RUNOFF(CFS) =    4.44
  EFFECTIVE AREA(ACRES) =     11.65    AREA-AVERAGED Fm(INCH/HR) =  0.51
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.68
  TOTAL AREA(ACRES) =       11.6        PEAK FLOW RATE(CFS) =      28.23

  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) = 0.39   HALFSTREET FLOOD WIDTH(FEET) =  13.20
  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.

****************************************************************************
  FLOW PROCESS FROM NODE  21304.00 TO NODE  21305.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1600.00  DOWNSTREAM ELEVATION(FEET) = 1580.00
  STREET LENGTH(FEET) =   267.45   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      33.35
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.44
    HALFSTREET FLOOD WIDTH(FEET) =   15.54
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.58
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.88
  STREET FLOW TRAVEL TIME(MIN.) =   0.68   Tc(MIN.) =   13.20
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.101
  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        0.80      0.75     0.600    56
```



```
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        3.59      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) =    4.39      SUBAREA RUNOFF(CFS) =   10.24
  EFFECTIVE AREA(ACRES) =     16.04    AREA-AVERAGED Fm(INCH/HR) =  0.51
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.68
  TOTAL AREA(ACRES) =       16.0        PEAK FLOW RATE(CFS) =      37.42

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.02; 6HR = 2.74; 24HR = 5.50

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.45   HALFSTREET FLOOD WIDTH(FEET) =  16.24
  FLOW VELOCITY(FEET/SEC.) =  6.79   DEPTH*VELOCITY(FT*FT/SEC.) =   3.06
  LONGEST FLOWPATH FROM NODE  21300.00 TO NODE  21305.00 =    1528.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21305.00 TO NODE  21306.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  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

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      49.85
    ***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.) =    6.74
    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
  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        8.99      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.29      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.680
  SUBAREA AREA(ACRES) =   11.28      SUBAREA RUNOFF(CFS) =   24.86
  EFFECTIVE AREA(ACRES) =     27.32    AREA-AVERAGED Fm(INCH/HR) =  0.51
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.68
```

```
  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) =      75.99
    ***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      Fp         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) =   31.57
  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
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  FLOW VELOCITY(FEET/SEC.) =  8.27   DEPTH*VELOCITY(FT*FT/SEC.) =   4.87
  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      Fp         Ap     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    56
  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<<<<<
```

```
  >>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) =     196.98

  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       18.20      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) =   18.20      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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       19.39      0.75     0.600    56
  SCHOOL                     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) =   54.08
  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
```

```
****************************************************************************
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       77.43      0.75     0.600    56
  SCHOOL                     B        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
```



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  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
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       10.40      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) =   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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.55      0.75     0.600    56
  MOBILE HOME PARK           B        1.01      0.75     0.250    56
  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
```

```
  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      Fp         Ap     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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        9.34      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) =     9.34      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<<<<<
```

```
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   17.49
  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
  EFFECTIVE STREAM AREA(ACRES) =      25.49
  TOTAL STREAM AREA(ACRES) =      25.49
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      49.80

****************************************************************************
  FLOW PROCESS FROM NODE  21330.00 TO NODE  21331.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   870.87
  ELEVATION DATA: UPSTREAM(FEET) =   1440.00  DOWNSTREAM(FEET) =   1425.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.920
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.003
  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
  "3-4 DWELLINGS/ACRE"       B        9.67      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) =     22.23
  TOTAL AREA(ACRES) =      9.67   PEAK FLOW RATE(CFS) =     22.23

  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  21331.00 TO NODE  21332.00 IS CODE =  33
----------------------------------------------------------------------------
  >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
==============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1425.00
  DOWNSTREAM NODE ELEVATION(FEET) =  1355.00
  FLOW LENGTH(FEET) =  1286.35   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   9.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.61
  PIPE-FLOW(CFS) =      22.23
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   1.46    Tc(MIN.) =  15.38
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.829
  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       22.89      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) =   22.89      SUBAREA RUNOFF(CFS) =   49.04
  EFFECTIVE AREA(ACRES) =     32.56    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) =      69.76

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 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) =   0.66
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  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) =   47.53
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.50
    HALFSTREET FLOOD WIDTH(FEET) =   18.13
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.50
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.27
  LONGEST FLOWPATH FROM NODE  21330.00 TO NODE  21332.00 =    2157.22 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21332.00 TO NODE  21332.00 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.) =   15.38
  RAINFALL INTENSITY(INCH/HR) =   2.83
  AREA-AVERAGED Fm(INCH/HR) =  0.45
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.60
  EFFECTIVE STREAM AREA(ACRES) =      32.56
  TOTAL STREAM AREA(ACRES) =      32.56
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      69.76

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       49.80   17.49    2.619  0.75( 0.45) 0.60      25.5   21320.00
      2       69.76   15.38    2.829  0.75( 0.45) 0.60      32.6   21330.00

  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      117.79   15.38    2.829  0.75( 0.45) 0.60      55.0   21330.00
    2      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      Fp         Ap     SCS
       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) =   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 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
  "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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       10.28      0.75     0.600    56
  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) =   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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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) =  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 Tc :
  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<<<<<
```

```
================================================================================
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       23.13      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) =   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
  TOTAL AREA(ACRES) =       89.2       PEAK FLOW RATE(CFS) =     242.84

  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 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        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) =     13.08
```



```
  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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        1.96      0.75     0.700    56
  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 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
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.89      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        6.98      0.75     0.700    56
  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) =      36.72

  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.59      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        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) =   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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       33.72      0.75     0.600    56
  COMMERCIAL                 B        0.32      0.75     0.100    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        1.48      0.75     0.700    56
  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<<<<<
```

```
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.50
  RAINFALL INTENSITY(INCH/HR) =   2.93
  AREA-AVERAGED Fm(INCH/HR) =  0.48
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.64
  EFFECTIVE STREAM AREA(ACRES) =      59.69
  TOTAL STREAM AREA(ACRES) =      59.69
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     131.94

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      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

  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      363.59   10.74    3.510  0.75( 0.48) 0.64     133.4   21340.00
      2      328.35   14.50    2.931  0.75( 0.48) 0.64     148.9   21350.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     363.59    Tc(MIN.) =    10.74
  EFFECTIVE AREA(ACRES) =     133.42   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  40.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  28.69
  PIPE-FLOW(CFS) =     363.59
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   0.76    Tc(MIN.) =  11.50
  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.) =   11.50
```



```
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.368
  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        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) =   18.03
  EFFECTIVE AREA(ACRES) =    140.28   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) =     364.67

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.91

****************************************************************************
  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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      363.59   11.56    3.358  0.75( 0.48) 0.64     140.3   21340.00
      2      330.23   15.32    2.835  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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      145.04   16.03    2.760  0.75( 0.45) 0.60      69.7   21330.00
      2      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.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   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
      2      473.42   15.32    2.835  0.75( 0.47) 0.63     222.4   21350.00
      3      464.70   16.03    2.760  0.75( 0.47) 0.63     225.5   21330.00
      4      430.47   18.14    2.562  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) =      495.25  Tc(MIN.) =   11.557
  EFFECTIVE AREA(ACRES) =    190.57  AREA-AVERAGED Fm(INCH/HR) =  0.47
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.63
  TOTAL 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 =  0.013

  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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) =   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) =     495.25
  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         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) =   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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        7.40      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) =    7.40      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
```

```
****************************************************************************
  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):
   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) =   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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        3.67      0.75     0.600    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) =   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) =     560.39
  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  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
   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
      2      529.39   18.95    2.496  0.75( 0.46) 0.62     284.3   21350.00
      3      519.64   19.67    2.441  0.75( 0.46) 0.62     287.3   21330.00
      4      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
      1      418.93   21.72    2.300  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 **
   STREAM       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
      2      933.86   18.95    2.496  0.75( 0.46) 0.62     504.1   21350.00
      3      928.08   19.67    2.441  0.75( 0.46) 0.62     515.5   21330.00
      4      903.97   21.72    2.300  0.75( 0.46) 0.62     542.2   21300.00
      5      900.12   21.85    2.292  0.75( 0.46) 0.62     542.3   21320.00
    TOTAL AREA(ACRES) =       542.3

  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
```

```
  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) =     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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       11.84      0.75     0.600    56
  MOBILE HOME PARK           B        3.43      0.75     0.250    56
  COMMERCIAL                 B        1.54      0.75     0.100    56
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       42.57      0.75     0.600    56
  MOBILE HOME PARK           B       41.35      0.75     0.250    56
  COMMERCIAL                 B       17.40      0.75     0.100    56
  AGRICULTURAL FAIR COVER
```

```
"ORCHARDS"                 B        0.33      0.63     1.000    65
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= 0.44;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%
         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;
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.
 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
TIME OF PEAK FLOW(HR) = 16.42  RUNOFF VOLUME(AF) =     337.63
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    1903.12
TOTAL AREA(ACRES) =     1442.0       PEAK FLOW RATE(CFS) =    1903.12

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.17

****************************************************************************
FLOW PROCESS FROM NODE  21361.00 TO NODE  21361.00 IS CODE =  11
----------------------------------------------------------------------------
>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

** MAIN STREAM CONFLUENCE DATA **
PEAK FLOW RATE(CFS) =     1903.12    Tc(MIN.) =   27.41
AREA-AVERAGED Fm(INCH/HR) =  0.45    Ybar = 0.49
TOTAL AREA(ACRES) =     1442.0
LONGEST FLOWPATH FROM NODE  21100.00 TO NODE  21361.00 =   17083.18 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      939.14   16.26    2.736  0.75( 0.46) 0.61     444.9   21340.00
    2      933.86   20.07    2.411  0.75( 0.46) 0.61     520.9   21350.00
    3      928.08   20.79    2.361  0.75( 0.46) 0.61     532.3   21330.00
    4      903.97   22.85    2.231  0.75( 0.46) 0.61     559.0   21300.00
    5      900.12   22.98    2.224  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= 0.44;30M= 0.91;1H= 1.20;3H= 1.90;6H= 2.54;24H= 5.15
S-GRAPH: VALLEY(DEV.)= 96.0%;VALLEY(UNDEV.)/DESERT=  4.0%
         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 = 0.91; 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=.0268; Lca/L=0.4,n=.0241; Lca/L=0.5,n=.0221;Lca/L=0.6,n=.0206
```



```
TIME OF PEAK FLOW(HR) = 16.42  RUNOFF VOLUME(AF) =     466.52
PEAK FLOW RATE(CFS) =    2588.96

****************************************************************************
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) =    2588.96
FLOW VELOCITY(FEET/SEC.) =  17.10   FLOW DEPTH(FEET) =   6.04
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  21378.00 TO NODE  21378.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
MAINLINE Tc(MIN.) =   28.38
* 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.959
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        4.75      0.75     0.600    56
COMMERCIAL                 B       11.57      0.75     0.100    56
MOBILE HOME PARK           B       12.66      0.75     0.250    56
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= 0.44;30M= 0.91;1H= 1.20;3H= 1.90;6H= 2.54;24H= 5.14
S-GRAPH: VALLEY(DEV.)= 96.1%;VALLEY(UNDEV.)/DESERT=  3.9%
         MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
Tc(HR) = 0.47; LAG(HR) = 0.38; Fm(INCH/HR) = 0.45; Ybar = 0.49
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=.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) =     475.57
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    2553.34
TOTAL AREA(ACRES) =     2030.2       PEAK FLOW RATE(CFS) =    2588.96
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
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  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 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
  "3-4 DWELLINGS/ACRE"       B        3.63      0.75     0.600    56   10.33
  COMMERCIAL                 B        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
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  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) =   0.90

    **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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        5.99      0.75     0.600    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 =  0.599
  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      Fp         Ap     SCS
       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) =   14.18
  EFFECTIVE AREA(ACRES) =     18.46    AREA-AVERAGED Fm(INCH/HR) =  0.37
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  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.50
  TOTAL AREA(ACRES) =       18.5        PEAK FLOW RATE(CFS) =      51.98

  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.94      0.75     0.600    56
  COMMERCIAL                 B        0.17      0.75     0.100    56
  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
```



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  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 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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       10.88      0.75     0.600    56
  COMMERCIAL                 B       14.84      0.75     0.100    56
  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) =     137.22

  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  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  28.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.71
  PIPE-FLOW(CFS) =     137.22
  *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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       33.59      0.75     0.600    56
  MOBILE HOME PARK           B        3.65      0.75     0.250    56
  COMMERCIAL                 B        1.26      0.75     0.100    56
  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
  TOTAL AREA(ACRES) =       87.8       PEAK FLOW RATE(CFS) =     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

  USER SPECIFIED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  35.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.89
  PIPE-FLOW(CFS) =     220.08
```



```
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  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):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B       12.70      0.75     0.250    56
  RESIDENTIAL
  "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) =   44.03
  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) =     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 =  0.013

  USER 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):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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) =   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.
   EQUIVALENT 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.) =     28.38
  AREA-AVERAGED Fm(INCH/HR)=  0.44   Ybar =  0.48
```



```
  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)
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             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

  *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  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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.742
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.271
  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
  "3-4 DWELLINGS/ACRE"       B        8.19      0.75      0.600    56   10.49
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        0.62      0.75      0.700    56   11.15
  COMMERCIAL                 B        0.44      0.75      0.100    56    7.74
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.583
  SUBAREA RUNOFF(CFS) =     31.92
  TOTAL AREA(ACRES) =      9.25   PEAK FLOW RATE(CFS) =     31.92

  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  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
```

```
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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) =      38.31

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75

****************************************************************************
  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) =      38.31
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        3.90      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) =    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      Fp         Ap     SCS
       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
```

```
  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
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       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) =    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       26.61      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) =   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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        1.06      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        5.55      0.75     0.600    56
  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) =   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
----------------------------------------------------------------------------
```

```
  >>>>>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 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
  "3-4 DWELLINGS/ACRE"       B        3.87      0.75     0.600    56   11.68
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        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      Fp         Ap     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 AREA(ACRES) =    7.50      SUBAREA RUNOFF(CFS) =   15.57
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.80      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) =    1.80      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
```

```
----------------------------------------------------------------------------
  >>>>>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) =      27.63
  FLOW VELOCITY(FEET/SEC.) =   2.52   FLOW DEPTH(FEET) =   0.47
  TRAVEL TIME(MIN.) =   2.15   Tc(MIN.) =   19.90
  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.) =   19.90
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.424
  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        5.90      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) =   10.49
  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) =      35.90

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75

****************************************************************************
  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  12.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.71
  PIPE-FLOW(CFS) =      35.90
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   0.28    Tc(MIN.) =  20.18
  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.) =   20.18
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.404
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        0.54      0.75     0.250    56
  PUBLIC PARK                B        1.31      0.75     0.850    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.69      0.75     0.600    56
  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) =    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
  TOTAL AREA(ACRES) =       22.8       PEAK FLOW RATE(CFS) =      39.91

  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  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  15.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.37
  PIPE-FLOW(CFS) =      39.91
  *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  21416.00 TO NODE  21416.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   20.77
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.362
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        2.38      0.75     0.250    56
  PUBLIC PARK                B        2.15      0.75     0.850    56
  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) =    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
  TOTAL AREA(ACRES) =       27.3       PEAK FLOW RATE(CFS) =      47.06

  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  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

  USER SPECIFIED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  15.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.67
  PIPE-FLOW(CFS) =      47.06
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   0.44    Tc(MIN.) =  21.21
  LONGEST FLOWPATH FROM NODE  21410.00 TO NODE  21417.00 =    3166.72 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21417.00 TO NODE  21417.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   21.21
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.333
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        0.24      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.73      0.75     0.600    56
  MOBILE HOME PARK           B        0.34      0.75     0.250    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.418
  SUBAREA AREA(ACRES) =    1.31      SUBAREA RUNOFF(CFS) =    2.38
  EFFECTIVE AREA(ACRES) =     28.62   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) =      48.71

  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  21417.00 TO NODE  21417.00 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.) =   21.21
  RAINFALL INTENSITY(INCH/HR) =   2.33
  AREA-AVERAGED Fm(INCH/HR) =  0.44
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.59
  EFFECTIVE STREAM AREA(ACRES) =      28.62
  TOTAL STREAM AREA(ACRES) =      28.62
```



```
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      48.71

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      164.31   15.19    2.850  0.75( 0.40) 0.53      74.4   21400.00
      2       48.71   21.21    2.333  0.75( 0.44) 0.59      28.6   21410.00

  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      208.74   15.19    2.850  0.75( 0.41) 0.54      94.9   21400.00
      2      178.37   21.21    2.333  0.75( 0.41) 0.55     103.1   21410.00

  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
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.54
  TOTAL AREA(ACRES) =      103.1
  LONGEST FLOWPATH FROM NODE  21400.00 TO NODE  21417.00 =    3607.36 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21417.00 TO NODE  21418.00 IS CODE =  42
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1250.00
  DOWNSTREAM NODE ELEVATION(FEET) =  1218.00
  FLOW LENGTH(FEET) =  2374.87   MANNING'S N =  0.013

  USER SPECIFIED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
  USER SPECIFIED PIPE SYSTEM UNDER PRESSURE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.73
  PIPE-FLOW(CFS) =     180.72
  PIPEFLOW TRAVEL TIME(MIN.) =   3.11    Tc(MIN.) =  18.30

  *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  29.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  31.39
  PIPE-FLOW(CFS) =     208.74
  PIPEFLOW TRAVEL TIME(MIN.) =   1.26    Tc(MIN.) =  16.45

  *PARALLEL PIPE SYSTEM (MANNING'S N = .0050):
  PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  LONGEST FLOWPATH FROM NODE  21400.00 TO NODE  21418.00 =    5982.23 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21418.00 TO NODE  21418.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   16.45
```

```
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.717
 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        3.88      0.75     0.600    56
 COMMERCIAL                 B        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) =   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       Q      Tc   Intensity   Fp(Fm)     Ap     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
     2      250.39   22.49    2.252  0.75( 0.34) 0.46     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
----------------------------------------------------------------------------
 >>>>>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) =     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.
```



```
****************************************************************************
 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<<<<<
 >>>>>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     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        7.20      0.75     0.600    56
 COMMERCIAL                 B       26.95      0.75     0.100    56
 MOBILE HOME PARK           B       13.18      0.75     0.250    56
 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= 0.44;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.
  EQUIVALENT 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
```

```
****************************************************************************
  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) =     2711.70    Tc(MIN.) =   29.20
  AREA-AVERAGED Fm(INCH/HR) =  0.44    Ybar = 0.48
  TOTAL AREA(ACRES) =     2201.0
  LONGEST FLOWPATH FROM NODE  21100.00 TO NODE  21418.00 =   19307.12 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      295.12   16.42    2.720  0.75( 0.34) 0.45     137.7   21400.00
      2      250.39   22.49    2.252  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:
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.44;30M= 0.91;1H= 1.20;3H= 1.88;6H= 2.50;24H= 5.08
  S-GRAPH: VALLEY(DEV.)= 96.6%;VALLEY(UNDEV.)/DESERT=  3.4%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.49; LAG(HR) = 0.39; Fm(INCH/HR) = 0.43; Ybar = 0.47
  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) =     2346.8
  LONGEST FLOWPATH FROM NODE  21100.00 TO NODE  21418.00 =   19307.12 FEET.
   EQUIVALENT 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) =     556.88
  PEAK FLOW RATE(CFS) =    2866.13

****************************************************************************
  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) =    2866.13
  FLOW VELOCITY(FEET/SEC.) =  21.82   FLOW DEPTH(FEET) =   5.48
  TRAVEL TIME(MIN.) =   1.51   Tc(MIN.) =   30.71
  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.) =   30.71
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.868
  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       13.22      0.75     0.600    56
  COMMERCIAL                 B       80.88      0.75     0.100    56
  MOBILE HOME PARK           B       29.32      0.75     0.250    56
  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= 0.44;30M= 0.91;1H= 1.20;3H= 1.88;6H= 2.49;24H= 5.06
  S-GRAPH: VALLEY(DEV.)= 96.8%;VALLEY(UNDEV.)/DESERT=  3.2%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  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.
  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=.0247; Lca/L=0.4,n=.0221; Lca/L=0.5,n=.0203;Lca/L=0.6,n=.0190
  TIME OF PEAK FLOW(HR) = 16.50  RUNOFF VOLUME(AF) =     597.13
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    2932.34
  TOTAL AREA(ACRES) =     2470.2       PEAK FLOW RATE(CFS) =    2932.34

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.84; 6HR = 2.35; 24HR = 4.75

****************************************************************************
  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) =   35.60
  ASSUME FULL-FLOWING BOX   BOX-FLOW VELOCITY(FEET/SEC.) =  16.47
  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.

****************************************************************************
  FLOW PROCESS FROM NODE  21420.00 TO NODE  21420.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   33.76
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.765
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                B       73.53      0.75      0.100    56
  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               B       28.10      0.75      0.850    56
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"     B       24.44      0.75      0.400    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 =  0.365
  SUBAREA AREA(ACRES) =  234.35
  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) = 0.56; LAG(HR) = 0.45; 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) =     2704.5
  LONGEST FLOWPATH FROM NODE  21100.00 TO NODE  21420.00 =   24292.93 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0241; Lca/L=0.4,n=.0216; Lca/L=0.5,n=.0199;Lca/L=0.6,n=.0185
  TIME OF PEAK FLOW(HR) = 16.50  RUNOFF VOLUME(AF) =     661.38
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    3079.58
  TOTAL AREA(ACRES) =     2704.5       PEAK FLOW RATE(CFS) =    3079.58

  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  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
  *GIVEN BOX HEIGHT(FEET) =   5.00   ESTIMATED BOX BASEWIDTH(FEET) =   33.43
  ASSUME FULL-FLOWING BOX   BOX-FLOW VELOCITY(FEET/SEC.) =  18.42
  BOX-FLOW(CFS) =    3079.58
  BOX-FLOW TRAVEL TIME(MIN.) =   0.79    Tc(MIN.) =   34.55
  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.) =   34.55
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.741
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK               B        0.85      0.75      0.850    56
```



```
  COMMERCIAL                B        0.87      0.75      0.100    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 =  0.482
  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.
   EQUIVALENT 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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       51.49      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        5.09      0.75     0.600    56
  PUBLIC PARK                B        3.37      0.75     0.850    56
  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.
   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) =    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<<<<<
==============================================================================
```

```
 MAINLINE Tc(MIN.) =   55.22
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.314
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B       65.40      0.75     0.100    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        1.90      0.75     0.600    56
 RESIDENTIAL
 "11+ DWELLINGS/ACRE"       B        4.85      0.75     0.200    56
 PUBLIC PARK                B        2.00      0.75     0.850    56
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"      B       47.14      0.75     0.400    56
 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= 0.44;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%
          MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
 Tc(HR) = 0.92; LAG(HR) = 0.74; Fm(INCH/HR) = 0.47; Ybar = 0.49
 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.
  EQUIVALENT 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) = 16.75  RUNOFF VOLUME(AF) =    3484.88
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    7414.68
 TOTAL AREA(ACRES) =    13911.6       PEAK FLOW RATE(CFS) =    7420.39
 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  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) =    7420.39
 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  21423.00 TO NODE  21423.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   55.65
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.308
```



```
 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        1.99      0.75     0.600    56
 COMMERCIAL                 B       11.78      0.75     0.100    56
 MOBILE HOME PARK           B        4.78      0.75     0.250    56
 PUBLIC PARK                B        1.74      0.75     0.850    56
 RESIDENTIAL
 "11+ DWELLINGS/ACRE"       B        0.99      0.75     0.200    56
 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= 0.44;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%
          MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
 Tc(HR) = 0.93; LAG(HR) = 0.74; 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) =    13932.8
 LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21423.00 =   51338.76 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0239; Lca/L=0.4,n=.0214; Lca/L=0.5,n=.0197;Lca/L=0.6,n=.0183
 TIME OF PEAK FLOW(HR) = 16.75  RUNOFF VOLUME(AF) =    3491.33
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    7374.18
 TOTAL AREA(ACRES) =    13932.8       PEAK FLOW RATE(CFS) =    7420.39
 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  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) =    7420.39
 FLOW VELOCITY(FEET/SEC.) =  25.18   FLOW DEPTH(FEET) =   8.13
 TRAVEL TIME(MIN.) =   0.46   Tc(MIN.) =   56.12
 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.) =   56.12
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.301
 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        0.52      0.75     0.600    56
  PUBLIC PARK                B        1.21      0.75     0.850    56
  MOBILE HOME PARK           B        4.21      0.75     0.250    56
  SCHOOL                     B        0.18      0.75     0.600    56
  COMMERCIAL                 B        0.96      0.75     0.100    56
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        0.39      0.75     0.200    56
  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= 0.44;30M= 0.90;1H= 1.19;3H= 1.95;6H= 2.65;24H= 5.84
  S-GRAPH: VALLEY(DEV.)= 77.1%;VALLEY(UNDEV.)/DESERT= 22.9%
           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;
  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=.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) =    3493.33
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    7317.10
  TOTAL AREA(ACRES) =    13940.3       PEAK FLOW RATE(CFS) =    7420.39
  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  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) =    7420.39    Tc(MIN.) =   56.12
  AREA-AVERAGED Fm(INCH/HR) =  0.47   Ybar = 0.49
  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
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.484
  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
```



```
  "5-7 DWELLINGS/ACRE"       B        0.20      0.75     0.500    56    6.53
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.38      0.75     0.600    56    6.92
  COMMERCIAL                 B        3.33      0.75     0.100    56    5.10
  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 = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.90; 6HR = 2.48; 24HR = 4.75

****************************************************************************
  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
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.840
  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        0.32      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    56
  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 = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.83; 6HR = 2.34; 24HR = 4.75
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  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         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) =   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 = 0.46; 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.

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  FLOW PROCESS FROM NODE  21433.00 TO NODE  21434.00 IS CODE =  63
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----------------------------------------------------------------------------
  >>>>>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) =      91.18
    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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        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    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) =   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
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 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) =     129.13
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.89
   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
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.432
 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
 "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) =   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 = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.92   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
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 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow 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
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.978
 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        2.44      0.75     0.600    56
 COMMERCIAL                 B       28.76      0.75     0.100    56
 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) =   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 = 0.46; 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) =  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
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 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.889
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B       22.52      0.75     0.100    56
 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) =   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

 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) =   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
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.771
 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"                 B        0.28      0.63     1.000    65
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 COMMERCIAL                 B       35.84      0.75     0.100    56
 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 = 0.46; 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) =   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
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.673
 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"                 B        0.33      0.63     1.000    65
 COMMERCIAL                 B       21.36      0.75     0.100    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        3.94      0.75     0.600    56
 MOBILE HOME PARK           B        2.98      0.75     0.250    56
 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) =     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      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1      7420.39   56.12    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= 0.44;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;
```



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  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=.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      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  MOBILE HOME PARK           B        6.41      0.75      0.250    56   12.59
  PUBLIC PARK                B        0.38      0.75      0.850    56   18.09
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.07      0.75      0.600    56   15.43
  SCHOOL                     B        0.09      0.75      0.600    56   15.43
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        0.25      0.75      0.200    56   12.14
```

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  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) =      39.29
    ***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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK                B        1.22      0.75     0.850    56
  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) =   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,
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         AND L =  701.1 FT WITH ELEVATION-DROP =   2.0 FT, IS   44.0 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  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      Q        Tc      AREA      HEADWATER
  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.
   EQUIVALENT 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
```

```
  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 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.)
  MOBILE HOME PARK           B        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
```



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  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.02      0.75     0.900    56
  MOBILE HOME PARK           B       18.33      0.75     0.250    56
  PUBLIC PARK                B        0.30      0.75     0.850    56
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        0.28      0.75     0.200    56
  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      Fp         Ap     SCS
       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) =      53.78
  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      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1      7433.87   58.08    14141.99    20120.00
     2        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 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
  "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
  COMMERCIAL                 B        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) =     26.96

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
```

```
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 4.75

****************************************************************************
  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

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      34.56
    ***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.) =    2.86
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.76
  STREET FLOW TRAVEL TIME(MIN.) =   2.79   Tc(MIN.) =   14.42
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.941
  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        6.47      0.75     0.500    56
  COMMERCIAL                 B        0.09      0.75     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.495
  SUBAREA AREA(ACRES) =    6.56      SUBAREA RUNOFF(CFS) =   15.17
  EFFECTIVE AREA(ACRES) =     16.55    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) =      38.50

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.02; 6HR = 2.73; 24HR = 4.75

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.64   HALFSTREET FLOOD WIDTH(FEET) =  24.79
  FLOW VELOCITY(FEET/SEC.) =  2.96   DEPTH*VELOCITY(FT*FT/SEC.) =   1.88
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  478.6 FT WITH ELEVATION-DROP =   3.0 FT, IS   19.6 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE  21462.00
  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) =      38.50
  FLOW VELOCITY(FEET/SEC.) =   9.79   FLOW DEPTH(FEET) =   0.99
  TRAVEL TIME(MIN.) =   0.46   Tc(MIN.) =   14.88
  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.) =   14.88
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.886
  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        0.34      0.75     0.600    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        8.08      0.75     0.500    56
  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.) =   15.51
  LONGEST 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<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   15.51
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.815
```

```
  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    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        0.26      0.75     0.100    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        8.00      0.75     0.500    56
  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) =   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 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21467.00 TO NODE  21467.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   19.14
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.481
  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        7.62      0.75      0.500    56
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 B        1.76      0.63      1.000    65
 COMMERCIAL                 B        2.13      0.75      0.100    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        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      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B        0.73      0.75      0.100    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        0.64      0.75      0.600    56
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"       B       11.78      0.75      0.500    56
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 B        2.68      0.63      1.000    65
 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      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B        8.14      0.75      0.100    56
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 B        7.28      0.63      1.000    65
 PUBLIC PARK                B        6.06      0.75      0.850    56
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"       B        3.35      0.75      0.500    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        0.97      0.75      0.600    56
 RESIDENTIAL
 ".4 DWELLING/ACRE"         B        0.23      0.75      0.900    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) =   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
```

```
  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      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1      7449.45   58.64    14163.99    20120.00
     2       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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B       17.62      0.75     0.500    56
  COMMERCIAL                 B        0.37      0.75     0.100    56
  PUBLIC PARK                B        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= 0.44;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)
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                          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

  *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
```



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 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  21500.00 TO NODE  21501.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   886.72
  ELEVATION DATA: UPSTREAM(FEET) =   1129.00  DOWNSTREAM(FEET) =   1127.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   15.536
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.812
  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        9.85      0.75      0.100    56   15.54
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.49      0.75      0.500    56   19.88
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.119
  SUBAREA RUNOFF(CFS) =     25.34
  TOTAL AREA(ACRES) =     10.34   PEAK FLOW RATE(CFS) =     25.34

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75

************************************************************************
  FLOW PROCESS FROM NODE  21501.00 TO NODE  21502.00 IS CODE =  92
------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
========================================================================
  UPSTREAM NODE ELEVATION(FEET) =   1127.00
  DOWNSTREAM NODE ELEVATION(FEET) =   1123.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   598.48
  "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) =  2.524
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        9.33      0.75     0.100    56
  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) =      45.10

  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       14.82      0.75     0.100    56
  RESIDENTIAL
```



```
  "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 =      80.30

****************************************************************************
  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 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        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) =     23.16

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75

****************************************************************************
  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) =  1110.00
  DOWNSTREAM NODE ELEVATION(FEET) =  1109.00
  FLOW LENGTH(FEET) =   221.35   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  18.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.39
  PIPE-FLOW(CFS) =      23.16
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  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  21512.00 TO NODE  21512.00 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.) =   17.27
  RAINFALL INTENSITY(INCH/HR) =   2.64
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       9.83
  TOTAL STREAM AREA(ACRES) =       9.83
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      23.16

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   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
      2       23.16   17.27    2.639  0.75( 0.07) 0.10       9.8   21510.00

  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       98.96   17.27    2.639  0.75( 0.11) 0.14      43.2   21510.00
      2      101.34   20.18    2.403  0.75( 0.11) 0.14      48.8   21500.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  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
  LONGEST FLOWPATH FROM NODE  21500.00 TO NODE  21512.00 =    2549.66 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21512.00 TO NODE  21513.00 IS CODE =  42
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
```



```
  UPSTREAM NODE ELEVATION(FEET) =  1109.00
  DOWNSTREAM NODE ELEVATION(FEET) =  1104.00
  FLOW LENGTH(FEET) =   128.97   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  23.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  20.50
  PIPE-FLOW(CFS) =     101.34
  *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.

****************************************************************************
  FLOW PROCESS FROM NODE  21513.00 TO NODE  21513.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  21470.00 TO NODE  21470.00 IS CODE = 15.1
----------------------------------------------------------------------------
  >>>>>DEFINE MEMORY BANK # 2 <<<<<
============================================================================
  PEAK FLOWRATE TABLE FILE NAME: 21470.DNA
  MEMORY BANK #  2 DEFINED AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     7472.38    Tc(MIN.) =   58.81
  AREA-AVERAGED Fm(INCH/HR) =  0.47    Ybar = 0.48
  TOTAL AREA(ACRES) =    14283.7
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21470.00 =   55971.39 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21470.00 TO NODE  21470.00 IS CODE = 14.0
----------------------------------------------------------------------------
  >>>>>MEMORY BANK #  2 COPIED ONTO MAIN-STREAM MEMORY<<<<<
============================================================================

  MAIN-STREAM MEMORY DEFINED AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     7472.38    Tc(MIN.) =   58.81
  AREA-AVERAGED Fm(INCH/HR) =  0.47    Ybar = 0.48
  TOTAL AREA(ACRES) =    14283.7
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21470.00 =   55971.39 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21470.00 TO NODE  21470.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  21470.00 TO NODE  21513.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1110.00  DOWNSTREAM(FEET) =   1104.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   186.42   CHANNEL SLOPE =  0.0322
  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.) =  43.17   FLOW DEPTH(FEET) =   5.31
  TRAVEL TIME(MIN.) =   0.07   Tc(MIN.) =   58.88
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21513.00 =   56157.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21513.00 TO NODE  21513.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   58.88
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.264
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       11.80      0.75     0.100    56
  PUBLIC PARK                B        1.02      0.75     0.850    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.70      0.75     0.500    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.46      0.75     0.900    56
  MOBILE HOME PARK           B        0.08      0.75     0.250    56
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        0.03      0.75     0.200    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.201
  SUBAREA AREA(ACRES) =   14.09
  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) = 0.79; 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) =    14297.7
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21513.00 =   56157.82 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) =    3595.09
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    7475.90
  TOTAL AREA(ACRES) =    14297.7       PEAK FLOW RATE(CFS) =    7475.90

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75

****************************************************************************
  FLOW PROCESS FROM NODE  21513.00 TO NODE  21513.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  PEAK FLOW RATE(CFS) =     7475.90    Tc(MIN.) =   58.88
  AREA-AVERAGED Fm(INCH/HR) =  0.47    Ybar = 0.48
  TOTAL AREA(ACRES) =    14297.7
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21513.00 =   56157.82 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       98.96   17.39    2.628  0.75( 0.11) 0.14      43.2   21510.00
      2      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.

  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= 5.81
  S-GRAPH: VALLEY(DEV.)= 77.6%;VALLEY(UNDEV.)/DESERT= 22.4%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  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.
  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) =    14346.6
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21513.00 =   56157.82 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) =    3611.45
  PEAK FLOW RATE(CFS) =    7503.95

****************************************************************************
  FLOW PROCESS FROM NODE  21513.00 TO NODE  21513.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  21513.00 TO NODE  21532.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1104.00  DOWNSTREAM(FEET) =   1081.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1794.30   CHANNEL SLOPE =  0.0128
  CHANNEL BASE(FEET) =   22.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =  11.00
  CHANNEL FLOW THRU SUBAREA(CFS) =    7503.95
  FLOW VELOCITY(FEET/SEC.) =  31.08   FLOW DEPTH(FEET) =   6.79
  TRAVEL TIME(MIN.) =   0.96   Tc(MIN.) =   59.85
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21532.00 =   57952.12 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21532.00 TO NODE  21532.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   59.85
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.252
  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        0.05      0.75     0.600    56
  PUBLIC PARK                B        3.40      0.75     0.850    56
  COMMERCIAL                 B        2.34      0.75     0.100    56
```

```
  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      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  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) =     22.56
```



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

****************************************************************************
  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      Fp         Ap      SCS
       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"       B        0.13      0.75     0.600    56
  COMMERCIAL                 B        0.15      0.75     0.100    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A        1.54      0.98     0.500    32
  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.
```

```
****************************************************************************
  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) = 32.00

  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) =      73.96
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.76
    HALFSTREET FLOOD WIDTH(FEET) =   34.59
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.93
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.98
  STREET 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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       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    56
  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) =      94.28

  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.

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  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) =     136.65
    ***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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        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    56
  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 =  0.28
  TOTAL 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.

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  FLOW PROCESS FROM NODE  21524.00 TO NODE  21525.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
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 >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
================================================================================
 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) =     206.10
   ***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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B       42.84      0.75     0.100    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        8.01      0.75     0.600    56
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"       B        5.50      0.75     0.500    56
 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
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 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.

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 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) =     293.51
   ***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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B       47.24      0.75     0.100    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        9.37      0.75     0.600    56
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"       B        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
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  AREA-AVERAGED Fp(INCH/HR) =  0.76  AREA-AVERAGED Ap =  0.23
  TOTAL AREA(ACRES) =      205.1        PEAK FLOW RATE(CFS) =     317.57

  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) = 1.11   HALFSTREET FLOOD WIDTH(FEET) =  53.99
  FLOW VELOCITY(FEET/SEC.) =  6.32   DEPTH*VELOCITY(FT*FT/SEC.) =   6.99

  *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) =  54.00    NUMBER OF PIPES =   1
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.41
  PIPE-FLOW(CFS) =     213.40
  PIPEFLOW TRAVEL TIME(MIN.) =   1.71    Tc(MIN.) =  27.92
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.978
  SUBAREA AREA(ACRES) =   56.77      SUBAREA RUNOFF(CFS) =   94.06
  TOTAL AREA(ACRES) =      205.1        PEAK FLOW RATE(CFS) =     332.40

  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) =  118.99
    ***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.) =    4.73
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.98
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         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
  LONGEST FLOWPATH FROM NODE  21520.00 TO NODE  21526.00 =    6183.54 FEET.

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  FLOW PROCESS FROM NODE  21526.00 TO NODE  21527.00 IS CODE =  33
----------------------------------------------------------------------------
  >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1173.00
  DOWNSTREAM NODE ELEVATION(FEET) =  1155.00
  FLOW LENGTH(FEET) =  1315.02   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.) =  13.82
  PIPE-FLOW(CFS) =     245.05
  PIPEFLOW TRAVEL TIME(MIN.) =   1.59    Tc(MIN.) =  29.50
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.914
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       49.34      0.75     0.100    56
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  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.74      0.75     0.600    56
  SCHOOL                     B        0.33      0.75     0.600    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.53      0.75     0.500    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.150
  SUBAREA AREA(ACRES) =   54.94      SUBAREA RUNOFF(CFS) =   89.08
  EFFECTIVE AREA(ACRES) =    260.07    AREA-AVERAGED Fm(INCH/HR) =  0.16
  AREA-AVERAGED Fp(INCH/HR) =  0.76  AREA-AVERAGED Ap =  0.22
  TOTAL AREA(ACRES) =      260.1        PEAK FLOW RATE(CFS) =     409.56

  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) =  164.51
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.92
    HALFSTREET FLOOD WIDTH(FEET) =   44.53
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.20
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.77

  *DEFICIENCY ANALYSIS(BASED ON REPLACEMENT SYSTEM HYDROLOGY):
  *REPLACEMENT PIPE SYSTEM (MANNING'S N = .0130):
  ESTIMATED PIPE DIAMETER(INCH) =  60.00    NUMBER OF PIPES =   1
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.30
  PIPE-FLOW(CFS) =     280.97
  PIPEFLOW TRAVEL TIME(MIN.) =   1.53    Tc(MIN.) =  29.45
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.916
  SUBAREA AREA(ACRES) =   54.94      SUBAREA RUNOFF(CFS) =   89.18
  TOTAL AREA(ACRES) =      260.1        PEAK FLOW RATE(CFS) =     410.05
  STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =  129.08
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.86
    HALFSTREET FLOOD WIDTH(FEET) =   41.66
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.84
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.16

  *PARALLEL PIPE SYSTEM (MANNING'S N = .0130):
  PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  1315.0 FT WITH ELEVATION-DROP =  18.0 FT, IS  151.5 CFS,
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       WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE  21527.00
  LONGEST FLOWPATH FROM NODE  21520.00 TO NODE  21527.00 =    7498.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21527.00 TO NODE  21528.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1155.00  DOWNSTREAM ELEVATION(FEET) = 1143.00
  STREET LENGTH(FEET) =  1250.52   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) =     445.07
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  1.31
    HALFSTREET FLOOD WIDTH(FEET) =   63.94
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.04
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    7.88
  STREET FLOW TRAVEL TIME(MIN.) =   3.45   Tc(MIN.) =   32.90
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.793
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       32.96      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        5.13      0.75     0.600    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        7.12      0.63     1.000    65
  SCHOOL                     B        4.48      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.70
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.326
  SUBAREA AREA(ACRES) =   49.69      SUBAREA RUNOFF(CFS) =   70.03
  EFFECTIVE AREA(ACRES) =    309.76    AREA-AVERAGED Fm(INCH/HR) =  0.17
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.23
  TOTAL AREA(ACRES) =      309.8        PEAK FLOW RATE(CFS) =     451.22

  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) = 1.31   HALFSTREET FLOOD WIDTH(FEET) =  64.18
  FLOW VELOCITY(FEET/SEC.) =  6.07   DEPTH*VELOCITY(FT*FT/SEC.) =   7.95

  *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:
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  ** 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.) =  13.52
  PIPE-FLOW(CFS) =     382.57
  PIPEFLOW TRAVEL TIME(MIN.) =   1.54    Tc(MIN.) =  30.99
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.858
  SUBAREA AREA(ACRES) =   49.69      SUBAREA RUNOFF(CFS) =   72.96
  TOTAL AREA(ACRES) =      309.8        PEAK FLOW RATE(CFS) =     469.48

  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) =   86.92
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.81
    HALFSTREET FLOOD WIDTH(FEET) =   39.40
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.78
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.08
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         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
  LONGEST FLOWPATH FROM NODE  21520.00 TO NODE  21528.00 =    8749.08 FEET.

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  FLOW PROCESS FROM NODE  21528.00 TO NODE  21529.00 IS CODE =  33
----------------------------------------------------------------------------
  >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1143.00
  DOWNSTREAM NODE ELEVATION(FEET) =  1125.00
  FLOW LENGTH(FEET) =  1283.55   MANNING'S N =  0.013

  USER SPECIFIED PIPE DIAMETER(INCH) =  63.00    NUMBER OF PIPES =   1
  USER SPECIFIED PIPE SYSTEM UNDER PRESSURE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.95
  PIPE-FLOW(CFS) =     323.92
  PIPEFLOW TRAVEL TIME(MIN.) =   1.43    Tc(MIN.) =  32.42
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.808
  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        1.95      0.75     0.600    56
  COMMERCIAL                 B       31.27      0.75     0.100    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.94      0.75     0.500    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.140
  SUBAREA AREA(ACRES) =   34.16      SUBAREA RUNOFF(CFS) =   52.39
  EFFECTIVE AREA(ACRES) =    343.92    AREA-AVERAGED Fm(INCH/HR) =  0.17
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.22
  TOTAL AREA(ACRES) =      343.9        PEAK FLOW RATE(CFS) =     508.03

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.08
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  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) =  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
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  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       14.30      0.75     0.100    56
  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
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  LONGEST FLOWPATH FROM NODE  21520.00 TO NODE  21530.00 =   11274.17 FEET.

****************************************************************************
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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) =     516.98
  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
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  ASSUME FULL-FLOWING PIPELINE
  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      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)       NODE
     1      7503.95   59.85    14352.37    20120.00
     2       516.98   36.41      375.64    21520.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
```

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  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 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
  "11+ DWELLINGS/ACRE"       B        2.95      0.75     0.200    56   11.02
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        3.62      0.75     0.600    56   14.01
  COMMERCIAL                 B        2.95      0.75     0.100    56   10.34
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.321
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  SUBAREA RUNOFF(CFS) =     28.70
  TOTAL AREA(ACRES) =      9.52   PEAK FLOW RATE(CFS) =     28.70

  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) =      46.89
    ***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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        4.32      0.75     0.200    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        9.37      0.75     0.600    56
  COMMERCIAL                 B        0.72      0.75     0.100    56
  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,
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       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) =      82.25
    ***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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        4.85      0.75     0.200    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       13.49      0.75     0.600    56
  COMMERCIAL                 B        0.99      0.75     0.100    56
  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) =      95.76

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75

  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.
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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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"               B        0.09      0.61     1.000    66
  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) =     123.56

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75

  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.

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  FLOW PROCESS FROM NODE  21544.00 TO NODE  21545.00 IS CODE =  63
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  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1145.00  DOWNSTREAM ELEVATION(FEET) = 1137.00
  STREET LENGTH(FEET) =   655.20   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) =     141.38
    ***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.) =    5.25
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.53
  STREET FLOW TRAVEL TIME(MIN.) =   2.08   Tc(MIN.) =   20.41
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.387
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        4.55      0.75     0.200    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       15.17      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.508
  SUBAREA AREA(ACRES) =   19.72      SUBAREA RUNOFF(CFS) =   35.62
  EFFECTIVE AREA(ACRES) =     81.99    AREA-AVERAGED Fm(INCH/HR) =  0.35
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.47
  TOTAL AREA(ACRES) =       82.0        PEAK FLOW RATE(CFS) =     150.27

  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) = 0.88   HALFSTREET FLOOD WIDTH(FEET) =  37.06
  FLOW VELOCITY(FEET/SEC.) =  5.33   DEPTH*VELOCITY(FT*FT/SEC.) =   4.70
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  655.2 FT WITH ELEVATION-DROP =   8.0 FT, IS   56.5 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE  21545.00
  LONGEST FLOWPATH FROM NODE  21540.00 TO NODE  21545.00 =    3631.80 FEET.

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  FLOW PROCESS FROM NODE  21545.00 TO NODE  21546.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
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  UPSTREAM ELEVATION(FEET) = 1137.00  DOWNSTREAM ELEVATION(FEET) = 1129.00
  STREET LENGTH(FEET) =   662.74   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =     168.84
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.92
    HALFSTREET FLOOD WIDTH(FEET) =   38.89
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.45
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.00
  STREET FLOW TRAVEL TIME(MIN.) =   2.03   Tc(MIN.) =   22.44
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.255
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        0.78      0.75     0.100    56
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        4.15      0.75     0.200    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       17.07      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.507
  SUBAREA AREA(ACRES) =   22.00      SUBAREA RUNOFF(CFS) =   37.15
  EFFECTIVE AREA(ACRES) =    103.99    AREA-AVERAGED Fm(INCH/HR) =  0.36
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.48
  TOTAL AREA(ACRES) =      104.0        PEAK FLOW RATE(CFS) =     177.69

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.93   HALFSTREET FLOOD WIDTH(FEET) =  39.68
  FLOW VELOCITY(FEET/SEC.) =  5.51   DEPTH*VELOCITY(FT*FT/SEC.) =   5.15

  *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.) =   7.29
  PIPE-FLOW(CFS) =      22.91
  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
  TOTAL AREA(ACRES) =      104.0        PEAK FLOW RATE(CFS) =     180.63
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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        8.36      0.75     0.100    56
  PUBLIC PARK                B        0.03      0.75     0.850    56
  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
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  END OF SUBAREA STREET FLOW HYDRAULICS:
  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) =     221.86
    ***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
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  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        8.51      0.75     0.400    56
  PUBLIC PARK                B        4.88      0.75     0.850    56
  COMMERCIAL                 B        0.69      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.83      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.548
  SUBAREA AREA(ACRES) =   15.91      SUBAREA RUNOFF(CFS) =   24.78
  EFFECTIVE AREA(ACRES) =    139.88    AREA-AVERAGED Fm(INCH/HR) =  0.35
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.47
  TOTAL AREA(ACRES) =      139.9        PEAK FLOW RATE(CFS) =     224.99

  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) = 1.00   HALFSTREET FLOOD WIDTH(FEET) =  42.91
  FLOW VELOCITY(FEET/SEC.) =  5.99   DEPTH*VELOCITY(FT*FT/SEC.) =   5.98

  *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) =  36.00    NUMBER OF PIPES =   1
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.92
  PIPE-FLOW(CFS) =      70.20
  PIPEFLOW TRAVEL TIME(MIN.) =   0.90    Tc(MIN.) =  23.88
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.173
  SUBAREA AREA(ACRES) =   15.91      SUBAREA RUNOFF(CFS) =   25.24
  TOTAL AREA(ACRES) =      139.9        PEAK FLOW RATE(CFS) =     229.04

  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) =  158.84
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.89
    HALFSTREET FLOOD WIDTH(FEET) =   37.42
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.53
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.91
  LONGEST FLOWPATH FROM NODE  21540.00 TO NODE  21548.00 =    5400.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21548.00 TO NODE  21549.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1115.00  DOWNSTREAM ELEVATION(FEET) = 1107.00
  STREET LENGTH(FEET) =   551.01   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00
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  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  10.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =     243.11
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  1.01
    HALFSTREET FLOOD WIDTH(FEET) =   43.34
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.35
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.39
  STREET FLOW TRAVEL TIME(MIN.) =   1.45   Tc(MIN.) =   25.32
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.097
  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        0.06      0.75     0.600    56
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B       17.33      0.75     0.400    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.401
  SUBAREA AREA(ACRES) =   17.39      SUBAREA RUNOFF(CFS) =   28.14
  EFFECTIVE AREA(ACRES) =    157.27    AREA-AVERAGED Fm(INCH/HR) =  0.35
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.46
  TOTAL AREA(ACRES) =      157.3        PEAK FLOW RATE(CFS) =     247.69

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 1.01   HALFSTREET FLOOD WIDTH(FEET) =  43.65
  FLOW VELOCITY(FEET/SEC.) =  6.38   DEPTH*VELOCITY(FT*FT/SEC.) =   6.46

  *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) =  39.00    NUMBER OF PIPES =   1
  ASSUME FULL-FLOWING PIPELINE
  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
  SUBAREA AREA(ACRES) =   17.39      SUBAREA RUNOFF(CFS) =   28.63
  TOTAL AREA(ACRES) =      157.3        PEAK FLOW RATE(CFS) =     252.11

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
  STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =  160.38
    ***STREET FLOWING FULL***
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    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      Fp          Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.29      0.75     0.600    56
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B       13.34      0.75     0.400    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.404
  SUBAREA AREA(ACRES) =   13.63      SUBAREA RUNOFF(CFS) =   21.68
  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
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  LONGEST FLOWPATH FROM NODE  21540.00 TO NODE  21550.00 =    6718.75 FEET.

****************************************************************************
  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      Fp          Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       46.15      0.75     0.600    56
  COMMERCIAL                 B        0.53      0.75     0.100    56
  PUBLIC PARK                B        1.63      0.75     0.850    56
  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,
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        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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        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) =     310.12
  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<<<<<
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============================================================================
  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 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
  "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      Fp         Ap     SCS
       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) =      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) =      14.56
  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 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
  "11+ DWELLINGS/ACRE"       B        6.71      0.75     0.200    56   12.70
```



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  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) =      29.11
    ***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      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        8.71      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) =    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
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 LONGEST FLOWPATH FROM NODE  21570.00 TO NODE  21572.00 =    1286.02 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  21572.00 TO NODE  21573.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION # 16 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1162.00  DOWNSTREAM ELEVATION(FEET) = 1157.00
 STREET LENGTH(FEET) =   421.59   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) =      49.09
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.64
   HALFSTREET FLOOD WIDTH(FEET) =   19.65
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.44
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.86
 STREET FLOW TRAVEL TIME(MIN.) =   1.58   Tc(MIN.) =   16.21
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.741
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "11+ DWELLINGS/ACRE"       B        9.18      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) =    9.18      SUBAREA RUNOFF(CFS) =   21.41
 EFFECTIVE AREA(ACRES) =     24.60    AREA-AVERAGED Fm(INCH/HR) =  0.15
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.20
 TOTAL AREA(ACRES) =       24.6        PEAK FLOW RATE(CFS) =      57.37

 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) =  21.42
 FLOW VELOCITY(FEET/SEC.) =  4.59   DEPTH*VELOCITY(FT*FT/SEC.) =   3.11
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  421.6 FT WITH ELEVATION-DROP =   5.0 FT, IS   31.4 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE  21573.00
 LONGEST FLOWPATH FROM NODE  21570.00 TO NODE  21573.00 =    1707.61 FEET.

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 FLOW PROCESS FROM NODE  21573.00 TO NODE  21574.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
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 >>>>>(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) =      68.56
   ***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      Fp         Ap     SCS
      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
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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      Fp         Ap     SCS
     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) =      93.21

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
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  HALFSTREET FLOOD WIDTH(FEET) =   30.33
  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) =     106.02
  ***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      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
RESIDENTIAL
"11+ DWELLINGS/ACRE"       B       11.25      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) =   11.25      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
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 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.346
 SUBAREA AREA(ACRES) =   11.25      SUBAREA RUNOFF(CFS) =   22.24
 TOTAL AREA(ACRES) =       57.5        PEAK FLOW RATE(CFS) =     113.76

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =   91.31
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.80
   HALFSTREET FLOOD WIDTH(FEET) =   27.40
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.98
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.97
 LONGEST FLOWPATH FROM NODE  21570.00 TO NODE  21576.00 =    3212.35 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  21576.00 TO NODE  21577.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION # 16 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1144.00  DOWNSTREAM ELEVATION(FEET) = 1136.00
 STREET LENGTH(FEET) =   506.86   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) =     124.38
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.84
   HALFSTREET FLOOD WIDTH(FEET) =   29.60
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.97
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.02
 STREET FLOW TRAVEL TIME(MIN.) =   1.42   Tc(MIN.) =   22.42
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.256
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "11+ DWELLINGS/ACRE"       B       11.21      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) =   11.21      SUBAREA RUNOFF(CFS) =   21.25
 EFFECTIVE AREA(ACRES) =     68.75    AREA-AVERAGED Fm(INCH/HR) =  0.15
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.20
 TOTAL AREA(ACRES) =       68.8        PEAK FLOW RATE(CFS) =     130.35

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
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 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) =  30.27
 FLOW VELOCITY(FEET/SEC.) =  6.02   DEPTH*VELOCITY(FT*FT/SEC.) =   5.15
 ** 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.) =   8.33
 PIPE-FLOW(CFS) =      26.20
 PIPEFLOW TRAVEL TIME(MIN.) =   1.01    Tc(MIN.) =  22.02
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.281
 SUBAREA AREA(ACRES) =   11.21      SUBAREA RUNOFF(CFS) =   21.50
 TOTAL AREA(ACRES) =       68.8        PEAK FLOW RATE(CFS) =     131.87

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =  105.67
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.80
   HALFSTREET FLOOD WIDTH(FEET) =   27.28
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.80
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.62
 LONGEST FLOWPATH FROM NODE  21570.00 TO NODE  21577.00 =    3719.21 FEET.

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 FLOW PROCESS FROM NODE  21577.00 TO NODE  21578.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION # 16 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1136.00  DOWNSTREAM ELEVATION(FEET) = 1130.00
 STREET LENGTH(FEET) =   412.82   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) =     140.46
   ***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.) =    5.89
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.24
 STREET FLOW TRAVEL TIME(MIN.) =   1.17   Tc(MIN.) =   23.19
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.211
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
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     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        8.62      0.75     0.200    56
  COMMERCIAL                 B        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.

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  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
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    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     154.44
    ***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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        4.85      0.75     0.200    56
  COMMERCIAL                 B        4.00      0.75     0.100    56
  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.

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  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
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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      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
RESIDENTIAL
"11+ DWELLINGS/ACRE"       B        4.37      0.75     0.200    56
COMMERCIAL                 B        5.00      0.75     0.100    56
PUBLIC PARK                B        0.80      0.75     0.850    56
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
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  STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
  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.

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  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) =     278.91
    ***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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B      100.00      0.75     0.200    56
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B       18.20      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) =  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
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  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
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  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
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        0.48      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.11      0.75     0.600    56
  SCHOOL                     B        3.06      0.75     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<<<<<
  >>>>>(STREET TABLE SECTION # 14 USED)<<<<<
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==========================================================================
  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      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B        0.96      0.75     0.100    56
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"        B        4.68      0.75     0.200    56
  MOBILE HOME PARK            B        8.89      0.75     0.250    56
  PUBLIC PARK                 B        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
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  SUBAREA AREA(ACRES) =   22.50      SUBAREA RUNOFF(CFS) =   34.56
  TOTAL AREA(ACRES) =      296.8        PEAK FLOW RATE(CFS) =     500.28

  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) =   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      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B        9.80      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        B        0.02      0.75     0.600    56
  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) =     500.28
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
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  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) = 1.50   HALFSTREET FLOOD WIDTH(FEET) =  80.74
  FLOW VELOCITY(FEET/SEC.) =  4.56   DEPTH*VELOCITY(FT*FT/SEC.) =   6.85

  *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.) =  10.64
  PIPE-FLOW(CFS) =     439.49
  PIPEFLOW TRAVEL TIME(MIN.) =   2.04    Tc(MIN.) =  28.59
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.950
  SUBAREA AREA(ACRES) =    9.82      SUBAREA RUNOFF(CFS) =   16.57
  TOTAL AREA(ACRES) =      306.6        PEAK FLOW RATE(CFS) =     500.28
  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
  STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =   60.79
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.82
    HALFSTREET FLOOD WIDTH(FEET) =   40.78
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.59
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.12
  LONGEST FLOWPATH FROM NODE  21570.00 TO NODE  21584.00 =    8076.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21584.00 TO NODE  21584.00 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.) =   28.59
  RAINFALL INTENSITY(INCH/HR) =   1.95
  AREA-AVERAGED Fm(INCH/HR) =  0.16
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.22
  EFFECTIVE STREAM AREA(ACRES) =     306.58
  TOTAL STREAM AREA(ACRES) =     306.58
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     500.28

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      310.12   29.57    1.911  0.75( 0.37) 0.49     220.8   21540.00
      2       14.56   19.37    2.463  0.75( 0.30) 0.40       5.3   21560.00
      3      500.28   28.59    1.950  0.75( 0.16) 0.22     306.6   21570.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.
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  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      726.52   19.37    2.463  0.75( 0.25) 0.33     357.6   21560.00
      2      818.80   28.59    1.950  0.75( 0.25) 0.33     525.4   21570.00
      3      810.32   29.57    1.911  0.75( 0.25) 0.33     532.7   21540.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     818.80    Tc(MIN.) =    28.59
  EFFECTIVE AREA(ACRES) =     525.36   AREA-AVERAGED Fm(INCH/HR) =  0.25
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.33
  TOTAL AREA(ACRES) =      532.7
  LONGEST FLOWPATH FROM NODE  21540.00 TO NODE  21584.00 =    8133.08 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21584.00 TO NODE  21585.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1099.00  DOWNSTREAM ELEVATION(FEET) = 1098.00
  STREET LENGTH(FEET) =  1435.00   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) =     863.36
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  2.62
    HALFSTREET FLOOD WIDTH(FEET) =  129.85
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.62
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.88
  STREET FLOW TRAVEL TIME(MIN.) =   9.12   Tc(MIN.) =   37.71
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.652
  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        0.20      0.75      0.900    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"        B        4.29      0.75      0.500    56
  COMMERCIAL                  B       59.18      0.75      0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.129
  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
  TOTAL AREA(ACRES) =      596.3        PEAK FLOW RATE(CFS) =     818.80
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
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 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
        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) = 120.00    NUMBER OF PIPES =   2
 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
     2      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
 AREA-AVERAGED Ap =  0.31  EFFECTIVE AREA(ACRES) =     589.03
 LONGEST FLOWPATH FROM NODE  21540.00 TO NODE  21585.00 =    9568.08 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  21585.00 TO NODE  21586.00 IS CODE =  33
----------------------------------------------------------------------------
 >>>>>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
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 PIPE-FLOW VELOCITY(FEET/SEC.) =  23.76
 PIPE-FLOW(CFS) =     822.04
 *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         Ap      SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 ".4 DWELLING/ACRE"         B        2.53      0.75      0.900    56
 PUBLIC PARK                B        0.25      0.75      0.850    56
 COMMERCIAL                 B       22.40      0.75      0.100    56
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"       B        0.54      0.75      0.500    56
 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 =  0.30
 TOTAL 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 = 4.75

 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) =   20.87
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.51
   HALFSTREET FLOOD WIDTH(FEET) =   17.59
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.18
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.62

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      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
     2      842.92   34.24    1.750  0.75( 0.23) 0.30     614.7   21570.00
     3      835.57   35.22    1.721  0.75( 0.23) 0.31     622.1   21540.00
 NEW PEAK FLOW DATA ARE:
 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
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
```

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==============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM        Q      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
      2       842.92   34.24    1.750  0.75( 0.23) 0.30     614.7   21570.00
      3       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.) =     60.11
  AREA-AVERAGED Fm(INCH/HR)=  0.45   Ybar =  0.47
  PEAK FLOW RATE(CFS)   =   7852.50
============================================================================
============================================================================
  END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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             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
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
```



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 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  21600.00 TO NODE  21601.00 IS CODE =  21
 ------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   909.54
  ELEVATION DATA: UPSTREAM(FEET) =   1100.00  DOWNSTREAM(FEET) =   1079.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.857
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.695
  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.)
  SCHOOL                     B        0.43      0.75      0.600    56   13.36
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        1.53      0.75      0.900    56   15.79
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        0.70      0.63      1.000    65   22.89
  COMMERCIAL                 B        2.31      0.75      0.100    56    9.86
  MOBILE HOME PARK           B        0.43      0.75      0.250    56   10.89
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.53      0.75      0.500    56   12.61
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.72
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.496
  SUBAREA RUNOFF(CFS) =     17.81
  TOTAL AREA(ACRES) =      5.93   PEAK FLOW RATE(CFS) =     17.81

  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  21601.00 TO NODE  21602.00 IS CODE =  92
 ------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
==========================================================================
  UPSTREAM NODE ELEVATION(FEET) =   1079.00
  DOWNSTREAM NODE ELEVATION(FEET) =   1078.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   351.04
  "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) =  3.176
  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        0.25      0.75     0.400    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        2.17      0.75     0.900    56
  SCHOOL                     B        0.70      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.793
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     21.47
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.07
  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
  EFFECTIVE AREA(ACRES) =    9.05     AREA-AVERAGED Fm(INCH/HR) =   0.44
  AREA-AVERAGED Fp(INCH/HR) =   0.73  AREA-AVERAGED Ap =   0.60
  TOTAL AREA(ACRES) =        9.1         PEAK FLOW RATE(CFS) =      22.30

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.74   FLOOD WIDTH(FEET) =   48.63
  FLOW VELOCITY(FEET/SEC.) =   2.09   DEPTH*VELOCITY(FT*FT/SEC) =   1.54
  LONGEST FLOWPATH FROM NODE  21600.00 TO NODE  21602.00 =    1260.58 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21602.00 TO NODE  21603.00 IS CODE =  92
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
==========================================================================
  UPSTREAM NODE ELEVATION(FEET) =   1078.00
  DOWNSTREAM NODE ELEVATION(FEET) =   1077.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   262.00
  "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) =  2.945
  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        2.61      0.75     0.400    56
  MOBILE HOME PARK           B        2.16      0.75     0.250    56
  COMMERCIAL                 B        1.99      0.75     0.100    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        1.42      0.75     0.900    56
```



```
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        1.39      0.63     1.000    65
  SCHOOL                     B        1.25      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.72
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.481
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     34.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.57
  AVERAGE FLOW DEPTH(FEET) =   0.79   FLOOD WIDTH(FEET) =   55.20
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.70   Tc(MIN.) =   14.39
  SUBAREA AREA(ACRES) =   10.82       SUBAREA RUNOFF(CFS) =   25.32
  EFFECTIVE AREA(ACRES) =   19.87     AREA-AVERAGED Fm(INCH/HR) =   0.39
  AREA-AVERAGED Fp(INCH/HR) =   0.72  AREA-AVERAGED Ap =   0.53
  TOTAL AREA(ACRES) =       19.9         PEAK FLOW RATE(CFS) =      45.74

  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 "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.85   FLOOD WIDTH(FEET) =   61.77
  FLOW VELOCITY(FEET/SEC.) =   2.71   DEPTH*VELOCITY(FT*FT/SEC) =   2.31
  LONGEST FLOWPATH FROM NODE  21600.00 TO NODE  21603.00 =    1522.58 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21603.00 TO NODE  21604.00 IS CODE =  92
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =   1077.00
  DOWNSTREAM NODE ELEVATION(FEET) =   1076.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   267.00
  "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) =  2.768
  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        4.96      0.75     0.400    56
  SCHOOL                     B        0.49      0.75     0.600    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        2.49      0.63     1.000    65
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.53      0.61     1.000    66
  MOBILE HOME PARK           B        3.02      0.75     0.250    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.58      0.75     0.500    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.69
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.526
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     58.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.85
  AVERAGE FLOW DEPTH(FEET) =   0.91   FLOOD WIDTH(FEET) =   68.64
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.56   Tc(MIN.) =   15.95
  SUBAREA AREA(ACRES) =   12.07       SUBAREA RUNOFF(CFS) =   26.13
  EFFECTIVE AREA(ACRES) =   31.94     AREA-AVERAGED Fm(INCH/HR) =   0.38
  AREA-AVERAGED Fp(INCH/HR) =   0.71  AREA-AVERAGED Ap =   0.53
  TOTAL AREA(ACRES) =       31.9         PEAK FLOW RATE(CFS) =      68.70
```

```
 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"      B        6.10      0.75     0.400    56
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 B        1.99      0.63     1.000    65
 NATURAL FAIR COVER
 "OPEN BRUSH"               B        1.73      0.61     1.000    66
 MOBILE HOME PARK           B        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    56
 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.

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 FLOW PROCESS FROM NODE  21605.00 TO NODE  21606.00 IS CODE =  92
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 >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
 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 = .0150
 PAVEMENT 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      Fp         Ap     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"                 B        1.87      0.63     1.000    65
 NATURAL FAIR COVER
 "OPEN BRUSH"               B        1.70      0.61     1.000    66
 RESIDENTIAL
 ".4 DWELLING/ACRE"         B        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) =   29.93
 EFFECTIVE 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) =      16.51
 PIPEFLOW 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) =   30.32
 EFFECTIVE 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.

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 FLOW PROCESS FROM NODE  21606.00 TO NODE  21607.00 IS CODE =  63
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 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
================================================================================
 UPSTREAM ELEVATION(FEET) = 1072.00  DOWNSTREAM ELEVATION(FEET) = 1068.00
 STREET LENGTH(FEET) =   610.02   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) =   0.90

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     147.59
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.97
   HALFSTREET FLOOD WIDTH(FEET) =   41.63
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.17
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.06
 STREET FLOW TRAVEL TIME(MIN.) =   2.44   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
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 SCHOOL                     B        2.14      0.75     0.600    56
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"      B       21.35      0.75     0.400    56
 RESIDENTIAL
 ".4 DWELLING/ACRE"         B        7.25      0.75     0.900    56
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"       B        0.76      0.75     0.500    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.531
 SUBAREA AREA(ACRES) =   31.50      SUBAREA RUNOFF(CFS) =   55.39
 EFFECTIVE AREA(ACRES) =     93.26    AREA-AVERAGED Fm(INCH/HR) =  0.40
 AREA-AVERAGED Fp(INCH/HR) =  0.60  AREA-AVERAGED Ap =  0.67
 TOTAL AREA(ACRES) =       93.3        PEAK FLOW RATE(CFS) =     163.72

 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) = 1.01   HALFSTREET FLOOD WIDTH(FEET) =  43.40
 FLOW VELOCITY(FEET/SEC.) =  4.26   DEPTH*VELOCITY(FT*FT/SEC.) =   4.30

 *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.) =   7.42
 PIPE-FLOW(CFS) =      61.64
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 PIPEFLOW TRAVEL TIME(MIN.) =   1.37    Tc(MIN.) =  19.87
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.426
 SUBAREA AREA(ACRES) =   31.50      SUBAREA RUNOFF(CFS) =   57.52
 TOTAL AREA(ACRES) =       93.3        PEAK FLOW RATE(CFS) =     170.02

 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) =  108.38
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.88
   HALFSTREET FLOOD WIDTH(FEET) =   36.81
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.89
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.41
 LONGEST FLOWPATH FROM NODE  21600.00 TO NODE  21607.00 =    3004.69 FEET.

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 FLOW PROCESS FROM NODE  21607.00 TO NODE  21608.00 IS CODE =  63
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 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1068.00  DOWNSTREAM ELEVATION(FEET) = 1065.00
 STREET LENGTH(FEET) =   648.50   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) =     199.79
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  1.15
   HALFSTREET FLOOD WIDTH(FEET) =   50.30
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.89
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.46
 STREET FLOW TRAVEL TIME(MIN.) =   2.78   Tc(MIN.) =   22.65
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.243
 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       17.95      0.75     0.400    56
 SCHOOL                     B        7.42      0.75     0.600    56
 RESIDENTIAL
 ".4 DWELLING/ACRE"         B        9.92      0.75     0.900    56
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"       B        1.26      0.75     0.500    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.580
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  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.

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  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
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    ***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
  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

  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 Tc :
  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.

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  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
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  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

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  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 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
  "3-4 DWELLINGS/ACRE"       B        4.71      0.75     0.600    56   21.72
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        1.82      0.75     0.400    56   19.71
  COMMERCIAL                 B        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
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    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        3.69      0.75     0.600    56
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        1.54      0.75     0.400    56
  COMMERCIAL                 B        0.81      0.75     0.100    56
  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
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 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.543
 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        2.58      0.75     0.600    56
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"      B        1.42      0.75     0.400    56
 COMMERCIAL                 B        1.19      0.75     0.100    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.431
 SUBAREA AREA(ACRES) =    5.19      SUBAREA RUNOFF(CFS) =   10.37
 EFFECTIVE AREA(ACRES) =     18.75    AREA-AVERAGED Fm(INCH/HR) =  0.35
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.47
 TOTAL AREA(ACRES) =       18.8        PEAK FLOW RATE(CFS) =      36.99

 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) = 0.64   HALFSTREET FLOOD WIDTH(FEET) =  24.79
 FLOW VELOCITY(FEET/SEC.) =  2.84   DEPTH*VELOCITY(FT*FT/SEC.) =   1.81
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        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.

****************************************************************************
 FLOW PROCESS FROM NODE  21613.00 TO NODE  21614.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(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
 Manning's FRICTION FACTOR for Streetflow Section(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
   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
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
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      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
 COMMERCIAL                 B        0.92      0.75     0.100    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.466
 SUBAREA AREA(ACRES) =    7.32      SUBAREA RUNOFF(CFS) =   13.58
 EFFECTIVE AREA(ACRES) =     26.07    AREA-AVERAGED Fm(INCH/HR) =  0.35
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.47
 TOTAL AREA(ACRES) =       26.1        PEAK FLOW RATE(CFS) =      48.33

 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) =  29.79
 FLOW VELOCITY(FEET/SEC.) =  2.61   DEPTH*VELOCITY(FT*FT/SEC.) =   1.92
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  262.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   24.1 CFS,
        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.

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 FLOW PROCESS FROM NODE  21614.00 TO NODE  21615.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
 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

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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 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
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        2.50      0.75     0.600    56
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  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        2.09      0.75     0.400    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.509
  SUBAREA AREA(ACRES) =    4.59      SUBAREA RUNOFF(CFS) =    8.13
  EFFECTIVE AREA(ACRES) =     30.66    AREA-AVERAGED Fm(INCH/HR) =  0.35
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.47
  TOTAL AREA(ACRES) =       30.7        PEAK FLOW RATE(CFS) =      55.02

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75

  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
  LONGEST FLOWPATH FROM NODE  21610.00 TO NODE  21615.00 =    1527.69 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21615.00 TO NODE  21616.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1075.00  DOWNSTREAM ELEVATION(FEET) = 1073.00
  STREET LENGTH(FEET) =   333.50   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) =      61.61
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.74
    HALFSTREET FLOOD WIDTH(FEET) =   30.04
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.28
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.43
  STREET FLOW TRAVEL TIME(MIN.) =   1.69   Tc(MIN.) =   22.67
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.242
  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        4.75      0.75     0.600    56
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        3.16      0.75     0.400    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.520
  SUBAREA AREA(ACRES) =    7.91      SUBAREA RUNOFF(CFS) =   13.19
  EFFECTIVE AREA(ACRES) =     38.57    AREA-AVERAGED Fm(INCH/HR) =  0.36
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.48
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  TOTAL AREA(ACRES) =       38.6        PEAK FLOW RATE(CFS) =      65.25

  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 STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.75   HALFSTREET FLOOD WIDTH(FEET) =  30.71
  FLOW VELOCITY(FEET/SEC.) =  3.33   DEPTH*VELOCITY(FT*FT/SEC.) =   2.51
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  333.5 FT WITH ELEVATION-DROP =   2.0 FT, IS   22.4 CFS,
         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.

****************************************************************************
  FLOW PROCESS FROM NODE  21616.00 TO NODE  21617.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1073.00  DOWNSTREAM ELEVATION(FEET) = 1071.00
  STREET LENGTH(FEET) =   271.50   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) =      70.12
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.75
    HALFSTREET FLOOD WIDTH(FEET) =   30.34
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.66
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.74
  STREET FLOW TRAVEL TIME(MIN.) =   1.24   Tc(MIN.) =   23.90
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.171
  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        4.01      0.75     0.600    56
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        2.09      0.75     0.400    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.531
  SUBAREA AREA(ACRES) =    6.10      SUBAREA RUNOFF(CFS) =    9.74
  EFFECTIVE AREA(ACRES) =     44.67    AREA-AVERAGED Fm(INCH/HR) =  0.37
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.49
  TOTAL AREA(ACRES) =       44.7        PEAK FLOW RATE(CFS) =      72.55

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
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  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         Ap     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) =      79.69

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75

  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
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  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      85.70
    ***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      Fp         Ap     SCS
       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    56
  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.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  21619.00 TO NODE  21620.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1066.00  DOWNSTREAM ELEVATION(FEET) = 1065.00
  STREET LENGTH(FEET) =   329.03   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) =      92.20
    ***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.) =    2.79
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.63
  STREET FLOW TRAVEL TIME(MIN.) =   1.97   Tc(MIN.) =   29.12
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.929
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        0.33      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.54      0.75     0.600    56
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        1.50      0.75     0.400    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.527
  SUBAREA AREA(ACRES) =    6.37      SUBAREA RUNOFF(CFS) =    8.80
  EFFECTIVE AREA(ACRES) =     66.06    AREA-AVERAGED Fm(INCH/HR) =  0.38
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.51
  TOTAL AREA(ACRES) =       66.1        PEAK FLOW RATE(CFS) =      92.15

  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) = 0.94   HALFSTREET FLOOD WIDTH(FEET) =  40.23
  FLOW VELOCITY(FEET/SEC.) =  2.78   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) =  27.00    NUMBER OF PIPES =   1
  ASSUME FULL-FLOWING PIPELINE
```



```
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.96
  PIPE-FLOW(CFS) =      15.74
  PIPEFLOW TRAVEL TIME(MIN.) =   1.39    Tc(MIN.) =  28.54
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.952
  SUBAREA AREA(ACRES) =    6.37      SUBAREA RUNOFF(CFS) =    8.93
  TOTAL AREA(ACRES) =       66.1        PEAK FLOW RATE(CFS) =      93.55

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
  STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =   77.81
    ***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.) =    2.68
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.39
  LONGEST FLOWPATH FROM NODE  21610.00 TO NODE  21620.00 =    3186.22 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21620.00 TO NODE  21621.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1065.00  DOWNSTREAM(FEET) =  1064.00
  FLOW LENGTH(FEET) =   255.17   MANNING'S N =  0.013
  DEPTH OF FLOW IN  51.0 INCH PIPE IS  40.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.82
  ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      93.55
  PIPE TRAVEL TIME(MIN.) =   0.54    Tc(MIN.) =   29.08
  LONGEST FLOWPATH FROM NODE  21610.00 TO NODE  21621.00 =    3441.39 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21621.00 TO NODE  21621.00 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.) =   29.08
  RAINFALL INTENSITY(INCH/HR) =   1.93
  AREA-AVERAGED Fm(INCH/HR) =  0.38
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.51
  EFFECTIVE STREAM AREA(ACRES) =      66.06
  TOTAL STREAM AREA(ACRES) =      66.06
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      93.55

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      224.63   24.48    2.141  0.64( 0.41) 0.65     129.8   21600.00
      2       93.55   29.08    1.930  0.75( 0.38) 0.51      66.1   21610.00

  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      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 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  21586.00 TO NODE  21586.00 IS CODE = 15.1
----------------------------------------------------------------------------
 >>>>>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.

****************************************************************************
 FLOW PROCESS FROM NODE  21586.00 TO NODE  21586.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  21586.00 TO NODE  21621.00 IS CODE =  54
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1079.00  DOWNSTREAM(FEET) =   1064.00
```



```
 CHANNEL LENGTH THRU SUBAREA(FEET) =  2939.98   CHANNEL SLOPE =  0.0051
 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         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"       B        6.61      0.75      0.400    56
 COMMERCIAL                  B        3.08      0.75      0.100    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"        B        2.19      0.75      0.600    56
 SCHOOL                      B        1.79      0.75      0.600    56
 RESIDENTIAL
 ".4 DWELLING/ACRE"          B        0.73      0.75      0.900    56
 PUBLIC PARK                 B        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
```

```
  AREA-AVERAGED Fm(INCH/HR) =  0.45    Ybar = 0.47
  TOTAL AREA(ACRES) =    15365.2
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21621.00 =   61258.38 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      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
  LONGEST FLOWPATH FROM NODE  21600.00 TO NODE  21621.00 =    4617.08 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= 2.60;24H= 5.70
  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) =    15561.0
  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) =    3920.09
  PEAK FLOW RATE(CFS) =    7680.81
    (UPSTREAM NODE PEAK FLOW RATE(CFS) =    7852.50)
  PEAK FLOW RATE(CFS) USED =    7852.50

****************************************************************************
  FLOW PROCESS FROM NODE  21621.00 TO NODE  21621.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  21621.00 TO NODE  21649.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  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
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =  11.00
  CHANNEL FLOW THRU SUBAREA(CFS) =    7852.50
  FLOW VELOCITY(FEET/SEC.) =  23.67   FLOW DEPTH(FEET) =   8.50
  TRAVEL TIME(MIN.) =   1.57   Tc(MIN.) =   63.85
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21649.00 =   63482.38 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21649.00 TO NODE  21649.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   63.85
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.204
  SUBAREA LOSS RATE DATA(AMC  II):
```



```
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        4.38      0.75      0.100    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.29      0.75      0.900    56
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B       27.30      0.75      0.400    56
  MOBILE HOME PARK           B        0.28      0.75      0.250    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.362
  SUBAREA AREA(ACRES) =   32.25
  UNIT-HYDROGRAPH DATA:
  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%
           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
  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) =    15593.3
  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) =    3928.51
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    7693.47
  TOTAL AREA(ACRES) =    15593.3       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  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  1 ARE:
  PEAK FLOW RATE(CFS) =    7852.50    Tc(MIN.) =   63.85
  AREA-AVERAGED Fm(INCH/HR) =  0.45   Ybar = 0.47
  TOTAL AREA(ACRES) =    15593.3

****************************************************************************
  FLOW PROCESS FROM NODE  21630.00 TO NODE  21631.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   870.00
  ELEVATION DATA: UPSTREAM(FEET) =   1072.00  DOWNSTREAM(FEET) =   1071.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   21.706
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.301
  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
```

```
  "8-10 DWELLINGS/ACRE"      B        8.40      0.75     0.400    56   21.71
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA RUNOFF(CFS) =     15.13
  TOTAL AREA(ACRES) =      8.40   PEAK FLOW RATE(CFS) =     15.13

  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  21631.00 TO NODE  21632.00 IS CODE =  92
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =   1071.00
  DOWNSTREAM NODE ELEVATION(FEET) =   1068.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   204.53
  "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):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        7.91      0.75     0.400    56
  MOBILE HOME PARK           B        6.40      0.75     0.250    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        2.07      0.75     0.900    56
  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 =  0.406
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     29.72
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.32
  AVERAGE FLOW DEPTH(FEET) =   0.65   FLOOD WIDTH(FEET) =   38.32
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.79   Tc(MIN.) =   22.50
  SUBAREA AREA(ACRES) =   16.66       SUBAREA RUNOFF(CFS) =   29.21
  EFFECTIVE AREA(ACRES) =   25.06     AREA-AVERAGED Fm(INCH/HR) =   0.30
  AREA-AVERAGED Fp(INCH/HR) =   0.75  AREA-AVERAGED Ap =   0.40
  TOTAL AREA(ACRES) =       25.1         PEAK FLOW RATE(CFS) =      43.97

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.24; 6HR = 1.57; 24HR = 3.04

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.71   FLOOD WIDTH(FEET) =   45.79
  FLOW VELOCITY(FEET/SEC.) =   4.61   DEPTH*VELOCITY(FT*FT/SEC) =   3.29
  LONGEST FLOWPATH FROM NODE  21630.00 TO NODE  21632.00 =    1074.53 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21632.00 TO NODE  21633.00 IS CODE =  92
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =   1068.00
  DOWNSTREAM NODE ELEVATION(FEET) =   1065.00
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  CHANNEL LENGTH THRU SUBAREA(FEET) =   305.50
  "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) =  2.181
  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       13.68      0.75     0.400    56
  MOBILE HOME PARK           B        2.18      0.75     0.250    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        1.97      0.75     0.900    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.437
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     58.85
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.16
  AVERAGE FLOW DEPTH(FEET) =   0.80   FLOOD WIDTH(FEET) =   56.39
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.22   Tc(MIN.) =   23.72
  SUBAREA AREA(ACRES) =   17.83       SUBAREA RUNOFF(CFS) =   29.76
  EFFECTIVE AREA(ACRES) =   42.89     AREA-AVERAGED Fm(INCH/HR) =   0.31
  AREA-AVERAGED Fp(INCH/HR) =   0.75  AREA-AVERAGED Ap =   0.42
  TOTAL AREA(ACRES) =       42.9         PEAK FLOW RATE(CFS) =      72.14

  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) =  0.85   FLOOD WIDTH(FEET) =   61.32
  FLOW VELOCITY(FEET/SEC.) =   4.34   DEPTH*VELOCITY(FT*FT/SEC) =   3.67
  LONGEST FLOWPATH FROM NODE  21630.00 TO NODE  21633.00 =    1380.03 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21633.00 TO NODE  21634.00 IS CODE =  92
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =   1065.00
  DOWNSTREAM NODE ELEVATION(FEET) =   1061.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   335.83
  "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) =  2.121
  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       15.81      0.75     0.400    56
  MOBILE HOME PARK           B        0.95      0.75     0.250    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        2.21      0.75     0.900    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.451
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     87.37
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.88
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  AVERAGE FLOW DEPTH(FEET) =   0.87   FLOOD WIDTH(FEET) =   63.71
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.15   Tc(MIN.) =   24.87
  SUBAREA AREA(ACRES) =   18.97       SUBAREA RUNOFF(CFS) =   30.45
  EFFECTIVE AREA(ACRES) =   61.86     AREA-AVERAGED Fm(INCH/HR) =   0.32
  AREA-AVERAGED Fp(INCH/HR) =   0.75  AREA-AVERAGED Ap =   0.43
  TOTAL AREA(ACRES) =       61.9         PEAK FLOW RATE(CFS) =     100.24

  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 "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.90   FLOOD WIDTH(FEET) =   67.30
  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.

****************************************************************************
  FLOW PROCESS FROM NODE  21634.00 TO NODE  21635.00 IS CODE =  92
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =   1061.00
  DOWNSTREAM NODE ELEVATION(FEET) =   1060.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   277.53
  "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) =  2.065
  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       13.91      0.75     0.400    56
  MOBILE HOME PARK           B        0.62      0.75     0.250    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        1.57      0.75     0.900    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.443
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =    112.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.11
  AVERAGE FLOW DEPTH(FEET) =   1.00   FLOOD WIDTH(FEET) =   79.47
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.13   Tc(MIN.) =   25.99
  SUBAREA AREA(ACRES) =   16.10       SUBAREA RUNOFF(CFS) =   25.12
  EFFECTIVE AREA(ACRES) =   77.96     AREA-AVERAGED Fm(INCH/HR) =   0.32
  AREA-AVERAGED Fp(INCH/HR) =   0.75  AREA-AVERAGED Ap =   0.43
  TOTAL AREA(ACRES) =       78.0         PEAK FLOW RATE(CFS) =     122.26

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75
  ** PIPE SIZED TO MAXIMIZE V-GUTTER FLOW AT DOWNSTREAM NODE **
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.50
  PIPE-FLOW(CFS) =      45.70
  PIPEFLOW TRAVEL TIME(MIN.) =   0.84    Tc(MIN.) =  25.71
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.079
  SUBAREA AREA(ACRES) =   16.10      SUBAREA RUNOFF(CFS) =   25.32
  EFFECTIVE AREA(ACRES) =   77.96    AREA-AVERAGED Fm(INCH/HR) =  0.32
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  AREA-AVERAGED Fp(INCH/HR) =  0.62  AREA-AVERAGED Ap =  0.52
  TOTAL AREA(ACRES) =       78.0        PEAK FLOW RATE(CFS) =     123.23
  V-GUTTER HYDRAULICS BASED ON MAINLINE Tc :
  V-GUTTER HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =   77.53

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.98   FLOOD WIDTH(FEET) =   77.16
  FLOW VELOCITY(FEET/SEC.) =   2.99   DEPTH*VELOCITY(FT*FT/SEC) =   2.93
  LONGEST FLOWPATH FROM NODE  21630.00 TO NODE  21635.00 =    1993.39 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21635.00 TO NODE  21636.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1060.00  DOWNSTREAM ELEVATION(FEET) = 1057.00
  STREET LENGTH(FEET) =   680.40   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =     150.64
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  1.05
    HALFSTREET FLOOD WIDTH(FEET) =   45.42
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.59
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.76
  STREET FLOW TRAVEL TIME(MIN.) =   3.16   Tc(MIN.) =   29.15
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.927
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        6.22      0.75     0.250    56
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B       30.75      0.75     0.400    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.375
  SUBAREA AREA(ACRES) =   36.97      SUBAREA RUNOFF(CFS) =   54.81
  EFFECTIVE AREA(ACRES) =    114.93    AREA-AVERAGED Fm(INCH/HR) =  0.31
  AREA-AVERAGED Fp(INCH/HR) =  0.65  AREA-AVERAGED Ap =  0.47
  TOTAL AREA(ACRES) =      114.9        PEAK FLOW RATE(CFS) =     167.43

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 1.09   HALFSTREET FLOOD WIDTH(FEET) =  47.37
  FLOW VELOCITY(FEET/SEC.) =  3.67   DEPTH*VELOCITY(FT*FT/SEC.) =   3.99
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  *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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
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  RESIDENTIAL
  "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
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  Manning's FRICTION FACTOR for Streetflow 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
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  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         Ap      SCS   Tc
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                  B        7.30      0.75      0.100    56   13.69
  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
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    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
  COMMERCIAL                B        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) =      44.82
    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         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                B        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
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  EFFECTIVE AREA(ACRES) =     21.41    AREA-AVERAGED Fm(INCH/HR) =  0.07
  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     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                B        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.
```

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****************************************************************************
  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) =      66.99
    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      Fp         Ap     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) =      71.30

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75

  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
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  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) =      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         Ap     SCS
       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
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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        8.13      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) =    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       11.59      0.75     0.100    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        1.73      0.75     0.900    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
```

```
  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      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1      7852.50   63.85    15593.28    20120.00
     2       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):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       55.41      0.75      0.900    56
  COMMERCIAL                 B        8.21      0.75      0.100    56
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        0.13      0.75      0.400    56
  SCHOOL                     B        0.17      0.75      0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.795
  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.
```

```
*******************************************************************************
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       17.50      0.75     0.100    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        8.34      0.61     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       56.16      0.75     0.900    56
  SCHOOL                     B        0.36      0.75     0.600    56
  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 = 0.47
  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) =    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) =    7852.50
  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
===============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =    15925.5  TC(MIN.) =     65.90
  AREA-AVERAGED Fm(INCH/HR)=  0.45   Ybar =  0.47
  PEAK FLOW RATE(CFS)   =   7852.50
===============================================================================
===============================================================================
  END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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                          Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* REDLANDS MPD  - UPDATE                                                *
* RATIONAL METHOD HYDROLOGY - TO NODE 20151                             *
* 25-YR HC ULTIMATE CONDITION    OCT 2013   DMALOTT                     *
 ************************************************************************

  FILE NAME: LR0201ZZ.DAT
  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

  *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
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 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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.474
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.918
  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        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 DWELLINGS/ACRE"         B        2.55      0.75     0.700    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) =     11.85

  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  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
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  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) =      18.25
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.30
    HALFSTREET FLOOD WIDTH(FEET) =    8.90
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   10.03
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.05
  STREET FLOW TRAVEL TIME(MIN.) =   0.23   Tc(MIN.) =    6.70
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.836
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     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
  "OPEN BRUSH"                B        0.90      0.61     1.000    66
  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) =   12.79
  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) =      24.36

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.33   HALFSTREET FLOOD WIDTH(FEET) =  10.07
  FLOW VELOCITY(FEET/SEC.) = 10.76   DEPTH*VELOCITY(FT*FT/SEC.) =   3.52
  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

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  10.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020
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  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      33.51
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.44
    HALFSTREET FLOOD WIDTH(FEET) =   15.77
    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
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.601
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"                A        1.17      0.86     1.000    46
  NATURAL FAIR COVER
  "OPEN BRUSH"                B        2.63      0.61     1.000    66
  RESIDENTIAL
  "2 DWELLINGS/ACRE"          B        3.01      0.75     0.700    56
  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) =   18.30
  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) =      40.90

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.47   HALFSTREET FLOOD WIDTH(FEET) =  17.10
  FLOW VELOCITY(FEET/SEC.) =  6.72   DEPTH*VELOCITY(FT*FT/SEC.) =   3.15
  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
  Manning's FRICTION FACTOR for Streetflow Section(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
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  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      76.68
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.59
  HALFSTREET FLOOD WIDTH(FEET) =   22.71
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.94
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.12
 STREET FLOW TRAVEL TIME(MIN.) =   0.60   Tc(MIN.) =    8.05
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.438
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL FAIR COVER
 "OPEN BRUSH"               A        1.82      0.86     1.000    46
 NATURAL FAIR COVER
 "OPEN BRUSH"               B       19.46      0.61     1.000    66
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        6.79      0.75     0.700    56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         A        0.01      0.98     0.700    32
 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) =   71.52
 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) =     110.20

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.66   HALFSTREET FLOOD WIDTH(FEET) =  26.01
 FLOW VELOCITY(FEET/SEC.) =  7.73   DEPTH*VELOCITY(FT*FT/SEC.) =   5.10
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  249.7 FT WITH ELEVATION-DROP =  10.0 FT, IS   74.7 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
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(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) = 18.00

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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
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  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     172.75
  ***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.) =    9.65
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    7.00
 STREET FLOW TRAVEL TIME(MIN.) =   1.29   Tc(MIN.) =    9.34
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.144
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL FAIR COVER
 "OPEN BRUSH"               A        5.68      0.86     1.000    46
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         A        3.92      0.98     0.700    32
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        6.10      0.75     0.700    56
 NATURAL FAIR COVER
 "OPEN BRUSH"               B       39.60      0.61     1.000    66
 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) =  124.93
 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) =     223.72

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.79   HALFSTREET FLOOD WIDTH(FEET) =  32.42
 FLOW VELOCITY(FEET/SEC.) = 10.29   DEPTH*VELOCITY(FT*FT/SEC.) =   8.11

 *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) =  33.00    NUMBER OF PIPES =   1
 DEPTH OF FLOW IN  33.0 INCH PIPE IS  26.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  21.64
 PIPE-FLOW(CFS) =     110.20
 PIPEFLOW TRAVEL TIME(MIN.) =   0.58    Tc(MIN.) =   8.62
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.298
 SUBAREA AREA(ACRES) =   55.30      SUBAREA RUNOFF(CFS) =  132.60
 TOTAL AREA(ACRES) =       98.5        PEAK FLOW RATE(CFS) =     237.37

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.38; 30M = 0.78; 1HR = 1.03; 3HR = 1.91; 6HR = 2.83; 24HR = 6.12
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =  127.17
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.66
  HALFSTREET FLOOD WIDTH(FEET) =   26.01
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    8.92
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.89
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 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) =     237.37
 FLOW VELOCITY(FEET/SEC.) =  10.01   FLOW DEPTH(FEET) =   2.41
 TRAVEL TIME(MIN.) =   2.06   Tc(MIN.) =   10.69
 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.) =   10.69
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.900
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL FAIR COVER
 "OPEN BRUSH"               A        2.42      0.86     1.000    46
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         A        7.44      0.98     0.700    32
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B       21.25      0.75     0.700    56
 NATURAL FAIR COVER
 "OPEN BRUSH"               B      127.72      0.61     1.000    66
 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) =  327.54
 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) =     529.63

 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  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) =     529.63
 FLOW VELOCITY(FEET/SEC.) =  10.89   FLOW DEPTH(FEET) =   1.48
 TRAVEL TIME(MIN.) =   2.04   Tc(MIN.) =   12.72
```



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 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.) =   12.72
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.612
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL FAIR COVER
 "OPEN BRUSH"               A        2.55      0.86     1.000    46
 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"               B       66.90      0.61     1.000    66
 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) =  165.69
 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) =     628.60

 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  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) =     628.60
 FLOW VELOCITY(FEET/SEC.) =  10.92   FLOW DEPTH(FEET) =   1.72
 TRAVEL TIME(MIN.) =   3.05   Tc(MIN.) =   15.77
 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.) =   15.77
 *  25 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
 NATURAL FAIR COVER
 "OPEN BRUSH"               A        3.92      0.86     1.000    46
 RESIDENTIAL
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  "2 DWELLINGS/ACRE"          A        0.86      0.98     0.700    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        A       16.85      0.98     0.600    32
  MOBILE HOME PARK            B       25.39      0.75     0.250    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        B       10.75      0.75     0.600    56
  NATURAL FAIR COVER
  "OPEN BRUSH"                B       87.64      0.61     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.67
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.791
  SUBAREA AREA(ACRES) =  145.41      SUBAREA RUNOFF(CFS) =  231.05
  EFFECTIVE AREA(ACRES) =    495.13   AREA-AVERAGED Fm(INCH/HR) =  0.59
  AREA-AVERAGED Fp(INCH/HR) =  0.66  AREA-AVERAGED Ap =  0.89
  TOTAL AREA(ACRES) =      495.1       PEAK FLOW RATE(CFS) =     760.30

  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  20108.00 TO NODE  20109.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2095.00  DOWNSTREAM(FEET) =   2020.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2023.91   CHANNEL SLOPE =  0.0371
  CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     760.30
  FLOW VELOCITY(FEET/SEC.) =  10.69   FLOW DEPTH(FEET) =   1.64
  TRAVEL TIME(MIN.) =   3.16   Tc(MIN.) =   18.92
  LONGEST FLOWPATH FROM NODE  20100.00 TO NODE  20109.00 =    8231.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20109.00 TO NODE  20109.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   18.92
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.058
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"                A        2.81      0.86     1.000    46
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        A       27.06      0.98     0.600    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        B       26.94      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"          B       35.77      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"                B      102.40      0.61     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.69
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.834
  SUBAREA AREA(ACRES) =  194.98      SUBAREA RUNOFF(CFS) =  260.46
  EFFECTIVE AREA(ACRES) =    690.11   AREA-AVERAGED Fm(INCH/HR) =  0.59
  AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap =  0.88
```



```
  TOTAL AREA(ACRES) =      690.1       PEAK FLOW RATE(CFS) =     914.67

  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  20109.00 TO NODE  20109.00 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.)= 32.0%;VALLEY(UNDEV.)/DESERT= 68.0%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.32; LAG(HR) = 0.25; Fm(INCH/HR) = 0.59; 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) =      690.1
  LONGEST FLOWPATH FROM NODE  20100.00 TO NODE  20109.00 =    8231.30 FEET.
   EQUIVALENT 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) = 16.25  RUNOFF VOLUME(AF) =     165.31
  UNIT-HYDROGRAPH METHOD PEAK FLOW RATE(CFS) =    868.00
  TOTAL PEAK FLOW RATE(CFS) =    868.00 (SOURCE FLOW INCLUDED)
  RATIONAL METHOD PEAK FLOW RATE(CFS) =    914.67
   (UPSTREAM NODE PEAK FLOW RATE(CFS) =    914.67)
  PEAK FLOW RATE(CFS) USED =    914.67

****************************************************************************
  FLOW PROCESS FROM NODE  20109.00 TO NODE  20110.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2020.00  DOWNSTREAM(FEET) =   1960.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1927.24   CHANNEL SLOPE =  0.0311
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   5.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     914.67
  FLOW VELOCITY(FEET/SEC.) =  25.24   FLOW DEPTH(FEET) =   2.44
  TRAVEL TIME(MIN.) =   1.27   Tc(MIN.) =   20.20
  LONGEST FLOWPATH FROM NODE  20100.00 TO NODE  20110.00 =   10158.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20110.00 TO NODE  20110.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   20.20
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.980
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"                A        5.83      0.86     1.000    46
  RESIDENTIAL
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  "3-4 DWELLINGS/ACRE"       A       33.80      0.98     0.600    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       25.19      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        9.84      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       45.99      0.61     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.780
  SUBAREA AREA(ACRES) =  120.65
  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.)= 35.7%;VALLEY(UNDEV.)/DESERT= 64.3%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.34; LAG(HR) = 0.27; Fm(INCH/HR) = 0.58; 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) =  2.50   TOTAL AREA(ACRES) =      810.8
  LONGEST FLOWPATH FROM NODE  20100.00 TO NODE  20110.00 =   10158.54 FEET.
   EQUIVALENT 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
  TIME OF PEAK FLOW(HR) = 16.33  RUNOFF VOLUME(AF) =     195.59
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =     987.06
  TOTAL AREA(ACRES) =      810.8       PEAK FLOW RATE(CFS) =     987.06

  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  20110.00 TO NODE  20111.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1960.00  DOWNSTREAM(FEET) =   1920.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   928.33   CHANNEL SLOPE =  0.0431
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   5.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     987.06
  FLOW VELOCITY(FEET/SEC.) =  28.99   FLOW DEPTH(FEET) =   2.32
  TRAVEL TIME(MIN.) =   0.53   Tc(MIN.) =   20.73
  LONGEST FLOWPATH FROM NODE  20100.00 TO NODE  20111.00 =   11086.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20111.00 TO NODE  20111.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   20.73
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.949
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               A       28.59      0.86     1.000    46
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A       31.08      0.98     0.600    32
```



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  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       31.56      0.75     0.600    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       41.72      0.61     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        5.26      0.75     0.900    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.76
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.815
  SUBAREA AREA(ACRES) =  138.21
  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.)= 37.1%;VALLEY(UNDEV.)/DESERT= 62.9%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.35; LAG(HR) = 0.28; Fm(INCH/HR) = 0.59; Ybar = 0.58
  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) =  2.50   TOTAL AREA(ACRES) =      949.0
  LONGEST FLOWPATH FROM NODE  20100.00 TO NODE  20111.00 =   11086.87 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0291; Lca/L=0.4,n=.0261; Lca/L=0.5,n=.0239;Lca/L=0.6,n=.0223
  TIME OF PEAK FLOW(HR) = 16.33  RUNOFF VOLUME(AF) =     225.07
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    1123.46
  TOTAL AREA(ACRES) =      949.0       PEAK FLOW RATE(CFS) =    1123.46

  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  20111.00 TO NODE  20112.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1920.00  DOWNSTREAM(FEET) =   1870.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1664.97   CHANNEL SLOPE =  0.0300
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   5.00
  CHANNEL FLOW THRU SUBAREA(CFS) =    1123.46
  FLOW VELOCITY(FEET/SEC.) =  26.44   FLOW DEPTH(FEET) =   2.74
  TRAVEL TIME(MIN.) =   1.05   Tc(MIN.) =   21.78
  LONGEST FLOWPATH FROM NODE  20100.00 TO NODE  20112.00 =   12751.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20112.00 TO NODE  20112.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   21.78
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.892
  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        8.51      0.98     0.600    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.54      0.75     0.600    56
  RESIDENTIAL
```

```
  ".4 DWELLING/ACRE"         A        3.29      0.98     0.900    32
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       75.85      0.75     0.900    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        7.12      0.61     1.000    66
  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.
   EQUIVALENT 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      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.19      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        3.83      0.75     0.900    56
  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.
   EQUIVALENT 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 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        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
  TOTAL AREA(ACRES) =      5.75   PEAK FLOW RATE(CFS) =     11.59

  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)<<<<<
============================================================================
```

```
  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         Ap     SCS
       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) =   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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"                B        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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"                B       33.25      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) =   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) =      81.57
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"                B       36.51      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) =   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) =     129.43

  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):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"                B       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) =   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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"                B       45.37      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) =   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.

****************************************************************************
```

```
  FLOW PROCESS FROM NODE  20128.00 TO NODE  20128.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   24.83
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.749
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       27.94      0.61     1.000    66
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        8.51      0.75     0.700    56
  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) =   37.92
  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) =     234.60

  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  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) =     234.60
  FLOW VELOCITY(FEET/SEC.) =   8.47   FLOW DEPTH(FEET) =   0.87
  TRAVEL TIME(MIN.) =   2.74   Tc(MIN.) =   27.58
  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.) =   27.58
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.642
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       18.57      0.61     1.000    66
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       10.38      0.75     0.700    56
  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) =   27.63
  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) =     240.27
```



```
  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  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.) =   31.93
  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.) =   31.93
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.504
  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       28.04      0.75     0.900    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       51.49      0.61     1.000    66
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       30.71      0.75     0.700    56
  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
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       19.93      0.75     0.900    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 =  0.891
  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 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        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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       15.44      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) =   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) =      39.69
```

```
 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL FAIR COVER
 "OPEN BRUSH"               B       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) =   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) =      72.45

 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL FAIR COVER
 "OPEN BRUSH"               B       61.27      0.61     1.000    66
 RESIDENTIAL
 ".4 DWELLING/ACRE"         B       11.25      0.75     0.900    56
 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
```



```
 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) =     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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL FAIR COVER
 "OPEN BRUSH"               B       27.90      0.61     1.000    66
 RESIDENTIAL
 ".4 DWELLING/ACRE"         B       18.45      0.75     0.900    56
 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
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        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) =   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      Fp         Ap     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) =   16.78
  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) =     236.96

  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       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) =   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
```

PEAK FLOW RATE(CFS) AT CONFLUENCE = 238.25

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER 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 NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	532.53	23.90	1.789	0.65(0.62)	0.95	499.1	20140.00
2	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/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL ".4 DWELLING/ACRE"	B	20.34	0.75	0.900	56
RESIDENTIAL "3-4 DWELLINGS/ACRE"	B	0.62	0.75	0.600	56

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
AREA-AVERAGED Fp(INCH/HR) = 0.66 AREA-AVERAGED Ap = 0.95

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/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL ".4 DWELLING/ACRE"	B	8.58	0.75	0.900	56
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 = 0.897
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.

```
  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      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"          B       24.58      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) =   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.
   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) =     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.) =     38.75
  AREA-AVERAGED Fm(INCH/HR)=  0.61   Ybar =  0.59
  PEAK FLOW RATE(CFS)   =   1238.39
============================================================================
============================================================================
```

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

```
 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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             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 20274                             *
* 25-YR  HC ULTIMATE CONDITION    OCT 2013   DMALOTT                    *
 ************************************************************************

  FILE NAME: LR0202ZZ.DAT
  TIME/DATE OF STUDY: 15:54 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) = 0.9900

  *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
```



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 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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.936
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.749
  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
  "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) =      9.04
  TOTAL 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
```

```
 MAXIMUM DEPTH(FEET) =   1.00
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.331
 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        6.32      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) =     14.01
 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
 SUBAREA AREA(ACRES) =    6.32       SUBAREA RUNOFF(CFS) =    9.93
 EFFECTIVE AREA(ACRES) =   10.96     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) =      17.23

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53

 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) =  0.61   FLOOD WIDTH(FEET) =   34.14
 FLOW VELOCITY(FEET/SEC.) =   3.08   DEPTH*VELOCITY(FT*FT/SEC) =   1.89
 LONGEST FLOWPATH FROM NODE  20200.00 TO NODE  20202.00 =    1129.55 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  20202.00 TO NODE  20203.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =      25.59
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.45
   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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
```



```
 "3-4 DWELLINGS/ACRE"       A       11.02      0.98     0.600    32
 MOBILE HOME PARK           A        0.23      0.98     0.250    32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.593
 SUBAREA AREA(ACRES) =   11.25      SUBAREA RUNOFF(CFS) =   16.72
 EFFECTIVE AREA(ACRES) =     22.21    AREA-AVERAGED Fm(INCH/HR) =  0.58
 AREA-AVERAGED Fp(INCH/HR) =  0.98  AREA-AVERAGED Ap =  0.60
 TOTAL AREA(ACRES) =       22.2        PEAK FLOW RATE(CFS) =      32.93

 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) =  16.18
 FLOW VELOCITY(FEET/SEC.) =  5.87   DEPTH*VELOCITY(FT*FT/SEC.) =   2.83
 LONGEST FLOWPATH FROM NODE  20200.00 TO NODE  20203.00 =    1499.05 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  20203.00 TO NODE  20204.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>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
 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) =      42.98
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.55
   HALFSTREET FLOOD WIDTH(FEET) =   19.62
   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
 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        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) =   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
```

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  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) =      63.05
    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.

****************************************************************************
```



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  FLOW PROCESS FROM NODE  20205.00 TO NODE  20206.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           A        4.58      0.98     0.250    32
  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
```

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  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      Fp         Ap     SCS
       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) =      76.08
  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 =      76.08

****************************************************************************
  FLOW PROCESS FROM NODE  20210.00 TO NODE  20211.00 IS CODE =  21
```



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----------------------------------------------------------------------------
  >>>>>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 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
  "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) =      17.70
    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      Fp         Ap     SCS
       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
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
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  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
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        2.35      0.98     0.600    32
  MOBILE HOME PARK           A        3.23      0.98     0.250    32
  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
```



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  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        0.63      0.98     0.600    32
  MOBILE HOME PARK           A        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
```

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----------------------------------------------------------------------------
  >>>>>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.) =   17.28
  RAINFALL INTENSITY(INCH/HR) =   2.09
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.98
  AREA-AVERAGED Ap =  0.51
  EFFECTIVE STREAM AREA(ACRES) =      21.18
  TOTAL STREAM AREA(ACRES) =      21.18
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      30.34

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   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
      2       30.34   17.28    2.089  0.98( 0.50) 0.51      21.2   20210.00

  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      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

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     103.24    Tc(MIN.) =    17.28
  EFFECTIVE AREA(ACRES) =      70.91   AREA-AVERAGED Fm(INCH/HR) =  0.47
  AREA-AVERAGED Fp(INCH/HR) =  0.98  AREA-AVERAGED Ap =  0.48
  TOTAL AREA(ACRES) =       81.8
  LONGEST FLOWPATH FROM NODE  20200.00 TO NODE  20214.00 =    3451.11 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20214.00 TO NODE  20215.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1840.00  DOWNSTREAM ELEVATION(FEET) = 1793.00
  STREET LENGTH(FEET) =  1205.58   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) =   0.82

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     129.42
```



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    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.75
    HALFSTREET FLOOD WIDTH(FEET) =   33.66
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.12
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.34
  STREET FLOW TRAVEL TIME(MIN.) =   2.82   Tc(MIN.) =   20.11
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.908
  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       18.86      0.98     0.600    32
  MOBILE HOME PARK           A       19.95      0.98     0.250    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.420
  SUBAREA AREA(ACRES) =   38.81      SUBAREA RUNOFF(CFS) =   52.33
  EFFECTIVE AREA(ACRES) =    109.72    AREA-AVERAGED Fm(INCH/HR) =  0.45
  AREA-AVERAGED Fp(INCH/HR) =  0.98  AREA-AVERAGED Ap =  0.46
  TOTAL AREA(ACRES) =      120.6        PEAK FLOW RATE(CFS) =     143.97

  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) = 0.77   HALFSTREET FLOOD WIDTH(FEET) =  36.00
  FLOW VELOCITY(FEET/SEC.) =  7.27   DEPTH*VELOCITY(FT*FT/SEC.) =   5.62
  LONGEST FLOWPATH FROM NODE  20200.00 TO NODE  20215.00 =    4656.69 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20215.00 TO NODE  20216.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1793.00  DOWNSTREAM ELEVATION(FEET) = 1740.00
  STREET LENGTH(FEET) =  1725.28   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) =     171.80
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.84
    HALFSTREET FLOOD WIDTH(FEET) =   40.44
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.97
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.82
  STREET FLOW TRAVEL TIME(MIN.) =   4.13   Tc(MIN.) =   24.23
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.706
  SUBAREA LOSS RATE DATA(AMC  II):
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```
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        A       24.17      0.98      0.600    32
  SCHOOL                      A        9.62      0.98      0.600    32
  MOBILE HOME PARK            A       14.92      0.98      0.250    32
  COMMERCIAL                  A        0.89      0.98      0.100    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        B        0.13      0.75      0.600    56
  COMMERCIAL                  B        0.31      0.75      0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.484
  SUBAREA AREA(ACRES) =   50.04      SUBAREA RUNOFF(CFS) =   55.60
  EFFECTIVE AREA(ACRES) =    159.76    AREA-AVERAGED Fm(INCH/HR) =  0.46
  AREA-AVERAGED Fp(INCH/HR) =  0.97  AREA-AVERAGED Ap =  0.47
  TOTAL AREA(ACRES) =      170.6        PEAK FLOW RATE(CFS) =     179.59

  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) = 0.84   HALFSTREET FLOOD WIDTH(FEET) =  40.87
  FLOW VELOCITY(FEET/SEC.) =  7.08   DEPTH*VELOCITY(FT*FT/SEC.) =   5.98
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1725.3 FT WITH ELEVATION-DROP =  53.0 FT, IS   95.7 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE  20216.00
  LONGEST FLOWPATH FROM NODE  20200.00 TO NODE  20216.00 =    6381.97 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20216.00 TO NODE  20232.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1740.00  DOWNSTREAM ELEVATION(FEET) = 1739.00
  STREET LENGTH(FEET) =  1052.00   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) =     185.34
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  1.43
    HALFSTREET FLOOD WIDTH(FEET) =   70.28
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.04
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.93
  STREET FLOW TRAVEL TIME(MIN.) =   8.59   Tc(MIN.) =   32.82
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.422
  SUBAREA LOSS RATE DATA(AMC  II):
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   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK            A        0.63      0.98      0.250    32
  COMMERCIAL                  B        1.46      0.75      0.100    56
  MOBILE HOME PARK            B        4.91      0.75      0.250    56
  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) =   11.49
  EFFECTIVE AREA(ACRES) =    170.86    AREA-AVERAGED Fm(INCH/HR) =  0.44
  AREA-AVERAGED Fp(INCH/HR) =  0.96  AREA-AVERAGED Ap =  0.46
  TOTAL AREA(ACRES) =      181.7        PEAK FLOW RATE(CFS) =     179.59
  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) = 1.42   HALFSTREET FLOOD WIDTH(FEET) =  69.55
  FLOW VELOCITY(FEET/SEC.) =  2.02   DEPTH*VELOCITY(FT*FT/SEC.) =   2.87

  *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 MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
  ESTIMATED PIPE DIAMETER(INCH) =  69.00    NUMBER OF PIPES =   1
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.14
  PIPE-FLOW(CFS) =     107.49
  PIPEFLOW TRAVEL TIME(MIN.) =   4.24    Tc(MIN.) =  28.47
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.548
  SUBAREA AREA(ACRES) =   11.10      SUBAREA RUNOFF(CFS) =   12.75
  TOTAL AREA(ACRES) =      181.7        PEAK FLOW RATE(CFS) =     179.59
  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) =   72.11
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  1.06
    HALFSTREET FLOOD WIDTH(FEET) =   51.67
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.59
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.69
  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.) =   28.47
  RAINFALL INTENSITY(INCH/HR) =   1.55
  AREA-AVERAGED Fm(INCH/HR) =  0.44
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  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 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
  "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      Fp         Ap     SCS
       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
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  TOTAL AREA(ACRES) =       11.0         PEAK FLOW RATE(CFS) =      17.45

  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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
  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.
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****************************************************************************
  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) =      38.31
    ***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.) =    5.44
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.69
  STREET FLOW TRAVEL TIME(MIN.) =   0.78   Tc(MIN.) =   16.33
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.162
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           A        2.51      0.98     0.250    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        4.90      0.98     0.600    32
  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) =   11.29
  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) =      42.68

  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) = 0.51   HALFSTREET FLOOD WIDTH(FEET) =  18.44
  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.

****************************************************************************
  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
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  STREET HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      49.89
    ***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.) =    5.54
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.03
  STREET FLOW TRAVEL TIME(MIN.) =   0.97   Tc(MIN.) =   17.30
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.088
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     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) =   14.43
  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) =      55.15

  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) =  21.06
  FLOW VELOCITY(FEET/SEC.) =  5.74   DEPTH*VELOCITY(FT*FT/SEC.) =   3.22
  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<<<<<
  >>>>>(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
```

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  Manning's FRICTION FACTOR for Streetflow Section(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) =      61.94
    ***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      Fp         Ap     SCS
       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) =      66.82

  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
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    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           A        9.70      0.98     0.250    32
  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) =      89.49
    ***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
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 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 MOBILE HOME PARK           A        4.46      0.98     0.250    32
 PUBLIC PARK                A        4.98      0.98     0.850    32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A        1.96      0.98     0.600    32
 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) =   13.90
 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) =      93.64

 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) =  24.48
 FLOW VELOCITY(FEET/SEC.) =  7.36   DEPTH*VELOCITY(FT*FT/SEC.) =   4.64
 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) =     102.85
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.64
   HALFSTREET FLOOD WIDTH(FEET) =   24.97
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.79
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.98
 STREET FLOW TRAVEL TIME(MIN.) =   1.09   Tc(MIN.) =   21.11
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.853
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      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
 PUBLIC PARK                A        6.33      0.98     0.850    32
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 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) =   18.42
 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) =     108.15

 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) =  25.46
 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.

****************************************************************************
 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) =     120.89
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.69
   HALFSTREET FLOOD WIDTH(FEET) =   27.47
   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
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.776
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 MOBILE HOME PARK           A       11.14      0.98     0.250    32
 PUBLIC PARK                A        6.85      0.98     0.850    32
 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) =   25.47
 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) =     127.46
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  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) = 0.70   HALFSTREET FLOOD WIDTH(FEET) =  28.02
  FLOW VELOCITY(FEET/SEC.) =  7.75   DEPTH*VELOCITY(FT*FT/SEC.) =   5.43
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  713.7 FT WITH ELEVATION-DROP =  26.0 FT, IS   51.4 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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     145.29
    ***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.) =    7.83
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.77
  STREET FLOW TRAVEL TIME(MIN.) =   1.92   Tc(MIN.) =   24.58
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.691
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           A       14.01      0.98     0.250    32
  MOBILE HOME PARK           B        8.21      0.75     0.250    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        2.69      0.98     0.600    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        3.23      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.88
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.324
  SUBAREA AREA(ACRES) =   28.14      SUBAREA RUNOFF(CFS) =   35.65
  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) =     154.74

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53
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  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.75   HALFSTREET FLOOD WIDTH(FEET) =  30.59
  FLOW VELOCITY(FEET/SEC.) =  7.96   DEPTH*VELOCITY(FT*FT/SEC.) =   5.98
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  900.3 FT WITH ELEVATION-DROP =  31.0 FT, IS   66.2 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE  20231.00
  LONGEST FLOWPATH FROM NODE  20220.00 TO NODE  20231.00 =    5272.72 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20231.00 TO NODE  20232.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>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
  STREET HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =     164.38
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.77
    HALFSTREET FLOOD WIDTH(FEET) =   31.56
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.96
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.14
  STREET FLOW TRAVEL TIME(MIN.) =   1.90   Tc(MIN.) =   26.48
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.617
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           A        0.17      0.98     0.250    32
  MOBILE HOME PARK           B        5.75      0.75     0.250    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       11.10      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) =   17.02      SUBAREA RUNOFF(CFS) =   19.29
  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) =     164.84

  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) = 0.77   HALFSTREET FLOOD WIDTH(FEET) =  31.56
  FLOW VELOCITY(FEET/SEC.) =  7.98   DEPTH*VELOCITY(FT*FT/SEC.) =   6.15
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  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         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
  LONGEST FLOWPATH FROM NODE  20220.00 TO NODE  20232.00 =    6178.11 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20232.00 TO NODE  20232.00 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.) =   26.48
  RAINFALL INTENSITY(INCH/HR) =   1.62
  AREA-AVERAGED Fm(INCH/HR) =  0.44
  AREA-AVERAGED Fp(INCH/HR) =  0.94
  AREA-AVERAGED Ap =  0.47
  EFFECTIVE STREAM AREA(ACRES) =     155.45
  TOTAL STREAM AREA(ACRES) =     155.45
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     164.84

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      179.59   28.47    1.548  0.96( 0.44) 0.46     170.9   20210.00
      1      169.53   32.46    1.431  0.96( 0.45) 0.46     181.7   20200.00
      2      164.84   26.48    1.617  0.94( 0.44) 0.47     155.4   20220.00

  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      342.28   26.48    1.617  0.95( 0.44) 0.46     314.3   20220.00
      2      334.77   28.47    1.548  0.95( 0.44) 0.46     326.3   20210.00
      3      308.34   32.46    1.431  0.95( 0.44) 0.47     337.2   20200.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     342.28    Tc(MIN.) =    26.48
  EFFECTIVE AREA(ACRES) =     314.32   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
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  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =     350.49
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  1.45
    HALFSTREET FLOOD WIDTH(FEET) =   71.26
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.75
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.44
  STREET FLOW TRAVEL TIME(MIN.) =   5.67   Tc(MIN.) =   32.14
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.440
  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        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) =   16.40
  EFFECTIVE AREA(ACRES) =    332.73    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) =     342.28
  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) = 1.44   HALFSTREET FLOOD WIDTH(FEET) =  70.65
  FLOW VELOCITY(FEET/SEC.) =  3.73   DEPTH*VELOCITY(FT*FT/SEC.) =   5.37

  *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.) =   8.36
  PIPE-FLOW(CFS) =     299.50
  PIPEFLOW TRAVEL TIME(MIN.) =   2.54    Tc(MIN.) =  29.02
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.531
  SUBAREA AREA(ACRES) =   18.41      SUBAREA RUNOFF(CFS) =   17.92
  TOTAL AREA(ACRES) =      355.6        PEAK FLOW RATE(CFS) =     342.28
  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) =   42.79
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
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    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 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
  "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) =     15.08
  TOTAL AREA(ACRES) =      8.56   PEAK FLOW RATE(CFS) =     15.08

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.37; 30M = 0.75; 1HR = 0.99; 3HR = 1.72; 6HR = 2.43; 24HR = 5.53

****************************************************************************
  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
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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        1.59      0.98     0.600    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.06      0.75     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      Fp         Ap     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    56
  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
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  SUBAREA AREA(ACRES) =    6.66       SUBAREA RUNOFF(CFS) =   10.88
  EFFECTIVE 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) =      30.82

  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) =  0.61   FLOOD WIDTH(FEET) =   33.24
  FLOW VELOCITY(FEET/SEC.) =   5.78   DEPTH*VELOCITY(FT*FT/SEC) =   3.51
  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) = 26.00

  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) =      37.45
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.53
    HALFSTREET FLOOD WIDTH(FEET) =   18.71
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.08
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.70
  STREET FLOW TRAVEL TIME(MIN.) =   0.96   Tc(MIN.) =   15.33
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.245
  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        3.29      0.98     0.600    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.18      0.75     0.600    56
  RESIDENTIAL
  ".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(ACRES) =    8.59      SUBAREA RUNOFF(CFS) =   13.26
  EFFECTIVE AREA(ACRES) =     27.46    AREA-AVERAGED Fm(INCH/HR) =  0.52
  AREA-AVERAGED Fp(INCH/HR) =  0.85  AREA-AVERAGED Ap =  0.62
  TOTAL AREA(ACRES) =       27.5        PEAK FLOW RATE(CFS) =      42.56

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
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  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) = 0.55   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.

****************************************************************************
  FLOW PROCESS FROM NODE  20244.00 TO NODE  20245.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(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
  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) =   0.73

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      48.34
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.54
    HALFSTREET FLOOD WIDTH(FEET) =   18.88
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.44
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.45
  STREET FLOW TRAVEL TIME(MIN.) =   0.71   Tc(MIN.) =   16.03
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.185
  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        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    56
  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) =   11.55
  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) =      52.63

  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) = 0.55   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.
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****************************************************************************
  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) =      59.86
    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      Fp         Ap     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"       B        5.36      0.75     0.600    56
  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
  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) =      64.29

  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.

****************************************************************************
  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)<<<<<
```



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============================================================================
  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

  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) =      70.07
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.65
    HALFSTREET 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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        3.02      0.98     0.600    32
  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
  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) =      73.12

  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) = 0.66   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
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 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =      78.10
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.62
   HALFSTREET FLOOD WIDTH(FEET) =   23.28
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.96
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.34
 STREET FLOW TRAVEL TIME(MIN.) =   0.63   Tc(MIN.) =   18.75
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.989
 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        1.94      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) =    9.96
 EFFECTIVE AREA(ACRES) =     61.27    AREA-AVERAGED Fm(INCH/HR) =  0.52
 AREA-AVERAGED Fp(INCH/HR) =  0.83  AREA-AVERAGED Ap =  0.62
 TOTAL AREA(ACRES) =       61.3        PEAK FLOW RATE(CFS) =      81.09

 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) =  23.63
 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.

****************************************************************************
 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
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 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) =      94.07
   ***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.) =    6.13
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.32
 STREET FLOW TRAVEL TIME(MIN.) =   4.32   Tc(MIN.) =   23.07
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.757
 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        0.28      0.98     0.600    32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B       21.09      0.75     0.600    56
 RESIDENTIAL
 ".4 DWELLING/ACRE"         B        0.85      0.75     0.900    56
 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) =   25.95
 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) =      94.21

 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) = 0.70   HALFSTREET FLOOD WIDTH(FEET) =  27.89
 FLOW VELOCITY(FEET/SEC.) =  6.14   DEPTH*VELOCITY(FT*FT/SEC.) =   4.33
 LONGEST FLOWPATH FROM NODE  20240.00 TO NODE  20249.00 =    4503.33 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  20249.00 TO NODE  20249.00 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.) =   23.07
 RAINFALL INTENSITY(INCH/HR) =   1.76
 AREA-AVERAGED Fm(INCH/HR) =  0.50
 AREA-AVERAGED Fp(INCH/HR) =  0.81
 AREA-AVERAGED Ap =  0.62
 EFFECTIVE STREAM AREA(ACRES) =      83.49
 TOTAL STREAM AREA(ACRES) =      83.49
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      94.21

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      342.28   29.02    1.531  0.94( 0.44) 0.47     332.7   20220.00
     1      334.77   31.08    1.469  0.94( 0.44) 0.47     344.7   20210.00
```

```
    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 **
   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

  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.

****************************************************************************
  FLOW PROCESS FROM NODE  20249.00 TO NODE  20250.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
============================================================================
  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

  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) =     423.32
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  1.43
    HALFSTREET FLOOD WIDTH(FEET) =   69.92
    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
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  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

  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

  *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
  *  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

  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) =  111.64
    ***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.) =    3.28
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.10
  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) =     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 = 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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.58      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       54.48      0.75     0.900    56
  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.
   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) = 16.50  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
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1      422.80   23.71    1.728  0.90( 0.46) 0.51     349.0   20240.00
      2      419.52   29.66    1.511  0.90( 0.45) 0.50     417.2   20220.00
      3      407.37   31.72    1.451  0.91( 0.45) 0.50     429.2   20210.00
      4      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
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1733.00  DOWNSTREAM(FEET) =   1670.00
  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
  CHANNEL FLOW THRU SUBAREA(CFS) =    1535.91
  FLOW VELOCITY(FEET/SEC.) =  27.58   FLOW DEPTH(FEET) =   3.34
  TRAVEL TIME(MIN.) =   1.44   Tc(MIN.) =   41.19
  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 =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   41.19
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.241
  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        3.23      0.75     0.600    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        0.07      0.98     0.600    32
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        9.49      0.75     0.900    56
  SCHOOL                     B       24.91      0.75     0.600    56
  SCHOOL                     A        0.90      0.98     0.600    32
  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= 0.38;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%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.69; LAG(HR) = 0.55; Fm(INCH/HR) = 0.58; Ybar = 0.57
  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=.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) =     507.17
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    1543.19
  TOTAL AREA(ACRES) =     2259.8       PEAK FLOW RATE(CFS) =    1543.19

  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  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) =    1543.19    Tc(MIN.) =   41.19
  AREA-AVERAGED Fm(INCH/HR) =  0.58   Ybar = 0.57
  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
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.494
  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        4.43      0.61     1.000    66   11.82
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        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) =     17.21
  TOTAL AREA(ACRES) =      6.57   PEAK FLOW RATE(CFS) =     17.21

  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  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) =      17.21
  FLOW VELOCITY(FEET/SEC.) =   3.58   FLOW DEPTH(FEET) =   0.31
  TRAVEL TIME(MIN.) =   2.72   Tc(MIN.) =   10.05
  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.) =   10.05
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.892
  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        4.44      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       15.90      0.61     1.000    66
  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      Fp         Ap     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) =   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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       17.48      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        7.48      0.61     1.000    66
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        6.85      0.75     0.700    56
```

```
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.71      0.75     0.900    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       10.89      0.75     0.700    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       11.99      0.75     0.900    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        4.30      0.61     1.000    66
  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) =     159.17
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       53.81      0.75     0.700    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       46.51      0.75     0.900    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       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<<<<<
============================================================================
```

```
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       30.11      0.75     0.900    56
  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 AREA(ACRES) =   30.57      SUBAREA RUNOFF(CFS) =   23.53
  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) =     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      Fp         Ap     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"       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) =   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
```



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  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  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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"               B        5.28      0.61     1.000    66
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       40.34      0.75     0.700    56
  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
```

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INSIDE STREET CROSSFALL(DECIMAL) =  0.020
OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(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      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
RESIDENTIAL
".4 DWELLING/ACRE"         B      100.00      0.75     0.900    56
RESIDENTIAL
".4 DWELLING/ACRE"         B       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
"OPEN BRUSH"               B        0.17      0.61     1.000    66
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
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  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) =  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
```

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MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) =   0.98

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     547.82
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  1.26
  HALFSTREET FLOOD WIDTH(FEET) =   61.50
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    8.10
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   10.18
STREET FLOW TRAVEL TIME(MIN.) =   2.80   Tc(MIN.) =   37.31
*  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.316
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       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= 0.37;30M= 0.75;1H= 0.99;3H= 1.72;6H= 2.43;24H= 5.53
S-GRAPH: VALLEY(DEV.)= 25.8%;VALLEY(UNDEV.)/DESERT= 74.2%
         MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
Tc(HR) = 0.62; LAG(HR) = 0.50; Fm(INCH/HR) = 0.62; 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) =      783.6
LONGEST FLOWPATH FROM NODE  20260.00 TO NODE  20272.00 =   10245.93 FEET.
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3,n=.0631; Lca/L=0.4,n=.0566; Lca/L=0.5,n=.0520;Lca/L=0.6,n=.0485
TIME OF PEAK FLOW(HR) = 16.50  RUNOFF VOLUME(AF) =     144.58
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =     558.24
TOTAL AREA(ACRES) =      783.6        PEAK FLOW RATE(CFS) =     558.24

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) = 1.26   HALFSTREET FLOOD WIDTH(FEET) =  61.86
FLOW VELOCITY(FEET/SEC.) =  8.15   DEPTH*VELOCITY(FT*FT/SEC.) =  10.30

*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) =  63.00    NUMBER OF PIPES =   1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY(FEET/SEC.) =  17.12
PIPE-FLOW(CFS) =     370.93
PIPEFLOW TRAVEL TIME(MIN.) =   1.32    Tc(MIN.) =  35.84
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.)= 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 = 0.63
USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC  II CONDITION.
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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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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
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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) =      839.2
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
```



```
**************************************************************************
  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) =     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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        2.08      0.75     0.900    56
  SCHOOL                     B        0.94      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.807
  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:
```

```
  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.
   EQUIVALENT 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
     2       598.55   37.42      842.18    20260.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  UNIT-HYDROGRAPH DATA:
```



```
  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.
   EQUIVALENT 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
```

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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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             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 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

  *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  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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.287
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.181
  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        6.22      0.61     1.000    66   12.01
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.99      0.75     0.900    56    8.29
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.63
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.986
  SUBAREA RUNOFF(CFS) =     16.61
  TOTAL AREA(ACRES) =      7.21   PEAK FLOW RATE(CFS) =     16.61

  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  20301.00 TO NODE  20302.00 IS CODE =  54
------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
========================================================================
  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) =      16.61
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.12      0.75     0.900    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        4.14      0.61     1.000    66
  SCHOOL                     B        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) =   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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        4.15      0.61     1.000    66
```



```
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.80      0.75     0.900    56
  SCHOOL                     B       20.38      0.75     0.600    56
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       18.37      0.61     1.000    66
  SCHOOL                     B       15.66      0.75     0.600    56
  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
```

```
  CHANNEL LENGTH THRU SUBAREA(FEET) =   823.37   CHANNEL SLOPE =  0.0729
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      85.73
  FLOW VELOCITY(FEET/SEC.) =   4.14   FLOW DEPTH(FEET) =   0.64
  TRAVEL TIME(MIN.) =   3.32   Tc(MIN.) =   24.61
  LONGEST FLOWPATH FROM NODE  20300.00 TO NODE  20305.00 =    3755.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20305.00 TO NODE  20305.00 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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        9.94      0.61     1.000    66
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        0.01      0.75     0.700    56
  SCHOOL                     B        7.91      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.66
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.823
  SUBAREA AREA(ACRES) =   17.86      SUBAREA RUNOFF(CFS) =   17.92
  EFFECTIVE AREA(ACRES) =     92.35   AREA-AVERAGED Fm(INCH/HR) =  0.53
  AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap =  0.79
  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  20305.00 TO NODE  20306.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2220.00  DOWNSTREAM(FEET) =   2190.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   801.97   CHANNEL SLOPE =  0.0374
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   3.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      93.58
  FLOW VELOCITY(FEET/SEC.) =   3.32   FLOW DEPTH(FEET) =   0.75
  TRAVEL TIME(MIN.) =   4.02   Tc(MIN.) =   28.63
  LONGEST FLOWPATH FROM NODE  20300.00 TO NODE  20306.00 =    4557.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20306.00 TO NODE  20306.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   28.63
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.512
  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        1.66      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       13.33      0.61     1.000    66
  SCHOOL                     B        2.17      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.63
  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
  AREA-AVERAGED Fp(INCH/HR) =  0.66  AREA-AVERAGED Ap =  0.81
  TOTAL AREA(ACRES) =      109.5       PEAK FLOW RATE(CFS) =      95.95

  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  20306.00 TO NODE  20307.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2190.00  DOWNSTREAM(FEET) =   2185.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   181.13   CHANNEL SLOPE =  0.0276
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   3.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      95.95
  FLOW VELOCITY(FEET/SEC.) =   2.97   FLOW DEPTH(FEET) =   0.80
  TRAVEL TIME(MIN.) =   1.02   Tc(MIN.) =   29.65
  LONGEST FLOWPATH FROM NODE  20300.00 TO NODE  20307.00 =    4739.04 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20307.00 TO NODE  20307.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   29.65
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.481
  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        1.33      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.26      0.75     0.600    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        3.26      0.61     1.000    66
  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
  EFFECTIVE AREA(ACRES) =    114.36   AREA-AVERAGED Fm(INCH/HR) =  0.54
  AREA-AVERAGED Fp(INCH/HR) =  0.66  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =      114.4       PEAK FLOW RATE(CFS) =      96.79

  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  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) =      96.79
  FLOW VELOCITY(FEET/SEC.) =   3.35   FLOW DEPTH(FEET) =   0.76
  TRAVEL TIME(MIN.) =   1.34   Tc(MIN.) =   30.99
  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.) =   30.99
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.442
  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        2.10      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.65      0.75     0.600    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        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) =    3.26
  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) =      96.79
  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  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
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      98.98
    ***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.) =    8.57
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.18
  STREET FLOW TRAVEL TIME(MIN.) =   0.84   Tc(MIN.) =   31.83
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.419
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     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) =    4.37
  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) =      97.98

  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) = 0.60   HALFSTREET FLOOD WIDTH(FEET) =  23.20
  FLOW VELOCITY(FEET/SEC.) =  8.52   DEPTH*VELOCITY(FT*FT/SEC.) =   5.15
  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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     100.07
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
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```
    STREET FLOW DEPTH(FEET) =  0.67
    HALFSTREET FLOOD WIDTH(FEET) =   26.43
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.80
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.55
  STREET FLOW TRAVEL TIME(MIN.) =   0.81   Tc(MIN.) =   32.63
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.398
  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        3.69      0.75     0.700    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) =    4.18
  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) =      99.80

  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) =  26.43
  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.

****************************************************************************
  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) =     101.76
    ***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.) =   11.12
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.12
  STREET FLOW TRAVEL TIME(MIN.) =   0.49   Tc(MIN.) =   33.13
```



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  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.385
  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        2.87      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        1.50      0.61     1.000    66
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.78      0.75     0.600    56
  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) =    3.92
  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) =     102.26

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

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.55   HALFSTREET FLOOD WIDTH(FEET) =  20.58
  FLOW VELOCITY(FEET/SEC.) = 11.12   DEPTH*VELOCITY(FT*FT/SEC.) =   6.13
  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) =     106.12
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.59
    HALFSTREET FLOOD WIDTH(FEET) =   22.28
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    9.95
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.83
  STREET FLOW TRAVEL TIME(MIN.) =   0.80   Tc(MIN.) =   33.93
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.366
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
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  "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):
  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) = 0.59   HALFSTREET FLOOD WIDTH(FEET) =  22.41
  FLOW VELOCITY(FEET/SEC.) =  9.99   DEPTH*VELOCITY(FT*FT/SEC.) =   5.87
  LONGEST FLOWPATH FROM NODE  20300.00 TO NODE  20312.00 =    6575.98 FEET.

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  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) =     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
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.13
  STREET FLOW TRAVEL TIME(MIN.) =   1.08   Tc(MIN.) =   35.00
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.340
  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        6.45      0.75     0.700    56
  RESIDENTIAL
  "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
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  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.

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  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) =     115.52
    ***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.) =    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
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        3.76      0.61     1.000    66
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        5.77      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
  SUBAREA AREA(ACRES) =   10.63      SUBAREA RUNOFF(CFS) =    7.37
  EFFECTIVE AREA(ACRES) =    166.10    AREA-AVERAGED Fm(INCH/HR) =  0.54
  AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap =  0.81
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  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.

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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        6.85      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.24      0.75     0.600    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        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) =    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
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  END OF SUBAREA STREET FLOW HYDRAULICS:
  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      Fp         Ap     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    56
  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.

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  FLOW PROCESS FROM NODE  20316.00 TO NODE  20317.00 IS CODE =  63
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------------------------------------------------------------------------------
  >>>>>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) =     123.70
    ***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.) =   10.25
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.31
  STREET FLOW TRAVEL TIME(MIN.) =   1.21   Tc(MIN.) =   38.98
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.256
  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        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) =    3.84
  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) =     121.79
  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) = 0.61   HALFSTREET FLOOD WIDTH(FEET) =  23.69
  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.

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  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)<<<<<
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  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

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =     125.66
    ***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.) =    8.47
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.68
  STREET FLOW TRAVEL TIME(MIN.) =   1.26   Tc(MIN.) =   40.25
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.233
  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        1.10      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.01      0.75     0.900    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       10.92      0.75     0.700    56
  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) =    7.75
  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) =     125.40

  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) = 0.67   HALFSTREET FLOOD WIDTH(FEET) =  26.56
  FLOW VELOCITY(FEET/SEC.) =  8.45   DEPTH*VELOCITY(FT*FT/SEC.) =   5.67
  LONGEST FLOWPATH FROM NODE  20300.00 TO NODE  20318.00 =    9957.32 FEET.

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  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
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INSIDE STREET CROSSFALL(DECIMAL) =  0.020
OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(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      Fp         Ap     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
"2 DWELLINGS/ACRE"         B      100.00      0.75     0.700    56
RESIDENTIAL
"2 DWELLINGS/ACRE"         B       28.82      0.75     0.700    56
NATURAL FAIR COVER
"OPEN BRUSH"               B       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) =     219.73
    ***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      Fp         Ap     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) =    1.85
  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) =     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

 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
```



```
 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         Ap      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    56
 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)<<<<<
============================================================================
  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) =      23.51
  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      Fp         Ap     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"               B        8.32      0.61     1.000    66
  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<<<<<
  >>>>>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
  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
```



```
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.410
  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       14.74      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) =   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         Ap     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) =    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)<<<<<
```

```
==========================================================================
  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) =      47.55
  FLOW VELOCITY(FEET/SEC.) =   2.95   FLOW DEPTH(FEET) =   0.57
  TRAVEL TIME(MIN.) =   3.87   Tc(MIN.) =   40.11
  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.) =   40.11
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.235
  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       48.19      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.06      0.75     0.600    56
  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) =   30.90
  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) =      73.51

  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  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) =      73.51
  FLOW VELOCITY(FEET/SEC.) =   3.31   FLOW DEPTH(FEET) =   0.67
  TRAVEL TIME(MIN.) =   7.00   Tc(MIN.) =   47.11
  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.) =   47.11
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.121
  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       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) =    8.71
  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) =      73.51
  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  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) =      73.51
  FLOW VELOCITY(FEET/SEC.) =   3.81   FLOW DEPTH(FEET) =   0.62
  TRAVEL TIME(MIN.) =   4.72   Tc(MIN.) =   51.83
  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.) =   51.83
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.059
  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       25.33      0.75     0.700    56
  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 =  0.699
  SUBAREA AREA(ACRES) =   25.60      SUBAREA RUNOFF(CFS) =   12.35
  EFFECTIVE AREA(ACRES) =    160.82   AREA-AVERAGED Fm(INCH/HR) =  0.54
  AREA-AVERAGED Fp(INCH/HR) =  0.71  AREA-AVERAGED Ap =  0.76
  TOTAL AREA(ACRES) =      160.8       PEAK FLOW RATE(CFS) =      74.80

  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  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) =      77.95
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.58
    HALFSTREET FLOOD WIDTH(FEET) =   22.22
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.35
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.29
  STREET FLOW TRAVEL TIME(MIN.) =   2.44   Tc(MIN.) =   54.27
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.030
  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
----------------------------------------------------------------------------
  >>>>>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) =      80.41
    ***STREET FLOWING FULL***
    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.48      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        5.88      0.75     0.900    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       11.27      0.75     0.700    56
  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<<<<<
==========================================================================
  TOTAL NUMBER OF STREAMS =  2
  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
  AREA-AVERAGED Ap =  0.76
  EFFECTIVE STREAM AREA(ACRES) =     192.29
  TOTAL STREAM AREA(ACRES) =     192.29
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      80.60

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```

```
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      218.80   41.75    1.206  0.70( 0.54) 0.77     361.5   20300.00
    2       80.60   56.16    1.009  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      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      299.40   41.75    1.206  0.71( 0.54) 0.77     504.5   20300.00
      2      234.82   56.16    1.009  0.71( 0.54) 0.77     553.8   20320.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     299.40    Tc(MIN.) =    41.75
  EFFECTIVE AREA(ACRES) =     504.48   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) =     303.35
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  1.04
    HALFSTREET FLOOD WIDTH(FEET) =   44.49
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.71
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    7.99
  STREET FLOW TRAVEL TIME(MIN.) =   2.89   Tc(MIN.) =   44.64
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.158
  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        1.05      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       12.65      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) =   13.70      SUBAREA RUNOFF(CFS) =    7.90
  EFFECTIVE AREA(ACRES) =    518.18    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) =     299.40
  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) =  44.31
  FLOW VELOCITY(FEET/SEC.) =  7.67   DEPTH*VELOCITY(FT*FT/SEC.) =   7.92

  *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) =  39.00    NUMBER OF PIPES =   1
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.28
  PIPE-FLOW(CFS) =     110.26
  PIPEFLOW TRAVEL TIME(MIN.) =   1.67    Tc(MIN.) =  43.43
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.178
  SUBAREA AREA(ACRES) =   13.70      SUBAREA RUNOFF(CFS) =    8.13
  TOTAL AREA(ACRES) =      567.5        PEAK FLOW RATE(CFS) =     299.40
  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) =  189.14
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.89
    HALFSTREET FLOOD WIDTH(FEET) =   37.41
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.81
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.09
  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.) =   43.43
  RAINFALL INTENSITY(INCH/HR) =   1.18
  AREA-AVERAGED Fm(INCH/HR) =  0.54
  AREA-AVERAGED Fp(INCH/HR) =  0.71
  AREA-AVERAGED Ap =  0.76
  EFFECTIVE STREAM AREA(ACRES) =     518.18
  TOTAL STREAM AREA(ACRES) =     567.51
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     299.40

****************************************************************************
  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
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.495
  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        6.76      0.75     0.700    56   13.21
  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) =     14.06

  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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        4.25      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.25      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) =    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      Fp         Ap     SCS
       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"       B        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
  TOTAL AREA(ACRES) =       18.1       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.
```

```
****************************************************************************
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        2.06      0.75     0.700    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        2.77      0.75     0.900    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.07      0.75     0.600    56
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       12.00      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.27      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        3.29      0.75     0.900    56
```



```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        3.53      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.62      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        3.41      0.75     0.900    56
  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
 STREET HALFWIDTH(FEET) = 18.00

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =      45.78
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.50
   HALFSTREET FLOOD WIDTH(FEET) =   18.13
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.26
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.15
 STREET FLOW TRAVEL TIME(MIN.) =   2.64   Tc(MIN.) =   30.20
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.464
 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        2.71      0.75     0.600    56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        6.04      0.75     0.700    56
 RESIDENTIAL
 ".4 DWELLING/ACRE"         B        1.62      0.75     0.900    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
 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
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.73
 TOTAL AREA(ACRES) =       56.5        PEAK FLOW RATE(CFS) =      46.71

 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) = 0.51   HALFSTREET FLOOD WIDTH(FEET) =  18.26
 FLOW VELOCITY(FEET/SEC.) =  6.31   DEPTH*VELOCITY(FT*FT/SEC.) =   3.19
 LONGEST FLOWPATH FROM NODE  20340.00 TO NODE  20347.00 =    4458.51 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  20347.00 TO NODE  20348.00 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) =   874.50   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) =   0.78

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      52.02
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.55
   HALFSTREET FLOOD WIDTH(FEET) =   20.27
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.81
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.17
 STREET FLOW TRAVEL TIME(MIN.) =   2.51   Tc(MIN.) =   32.71
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.396
 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        0.78      0.75     0.600    56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B       12.66      0.75     0.700    56
 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) =   10.60
 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) =      53.84

 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) =  20.51
 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.

****************************************************************************
 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
```

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  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      66.23
  ***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      Fp         Ap     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
     2       75.15   34.98    1.341  0.75( 0.53) 0.71     103.6   20340.00
```



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 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      374.55   34.98    1.341  0.71( 0.54) 0.75     521.0   20340.00
     2      359.33   43.43    1.178  0.71( 0.54) 0.76     621.8   20300.00
     3      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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
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STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(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      Fp         Ap     SCS
     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
RESIDENTIAL
"3-4 DWELLINGS/ACRE"       B        4.52      0.75     0.600    56
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%
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         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) =     643.64
    ***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      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        7.14      0.75     0.600    56
  RESIDENTIAL
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".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.
 EQUIVALENT 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
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  AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.43
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.15

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 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) =     684.43
   ***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      Fp         Ap      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= 0.42;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.
  EQUIVALENT 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):
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  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.
```



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****************************************************************************
  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      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  SCHOOL                     B       10.49      0.75     0.600    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.59      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       21.45      0.75     0.900    56
  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.
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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  SCHOOL                     B       20.64      0.75     0.600    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.09      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       25.75      0.75     0.900    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.69      0.61     1.000    66
  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.
   EQUIVALENT 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
  TOTAL AREA(ACRES) =     4029.5       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  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
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B       13.67      0.75     0.250    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       19.97      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        5.87      0.75     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= 0.38;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.
   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) = 16.58  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 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        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) =     12.02

  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        5.52      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.40      0.75     0.600    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        3.20      0.61     1.000    66
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        3.04      0.75     0.400    56
  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) =   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      Fp         Ap     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"         B        5.13      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.30      0.61     1.000    66
  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      Fp         Ap     SCS
       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"       B        1.47      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) =   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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.95      0.75     0.600    56
  RESIDENTIAL
```

```
  "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      Fp         Ap     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"          B        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
```



```
  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         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"          B       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) =   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      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"          B       15.48      0.75     0.700    56
```

```
  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      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"          B       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 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      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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
  "2 DWELLINGS/ACRE"          B        7.31      0.75     0.700    56
  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:
```

```
    STREET FLOW DEPTH(FEET) =  0.68
    HALFSTREET FLOOD WIDTH(FEET) =   27.23
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.55
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.80
  STREET FLOW TRAVEL TIME(MIN.) =   2.31   Tc(MIN.) =   52.19
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.055
  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        1.23      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.24      0.75     0.900    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        4.18      0.75     0.700    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.687
  SUBAREA AREA(ACRES) =    5.65      SUBAREA RUNOFF(CFS) =    2.75
  EFFECTIVE AREA(ACRES) =    172.49    AREA-AVERAGED Fm(INCH/HR) =  0.53
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.71
  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.

****************************************************************************
  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)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1845.00  DOWNSTREAM ELEVATION(FEET) = 1825.00
  STREET LENGTH(FEET) =   580.50   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) =      94.22
    ***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.) =    7.01
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.51
```



```
  STREET FLOW TRAVEL TIME(MIN.) =   1.38   Tc(MIN.) =   53.58
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.038
  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        3.05      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       36.06      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) =   39.11      SUBAREA RUNOFF(CFS) =   18.32
  EFFECTIVE AREA(ACRES) =    211.60    AREA-AVERAGED Fm(INCH/HR) =  0.52
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.70
  TOTAL AREA(ACRES) =      211.6        PEAK FLOW RATE(CFS) =      97.91

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.90; 1HR = 1.18; 3HR = 1.99; 6HR = 2.75; 24HR = 5.50

  END OF SUBAREA STREET FLOW HYDRAULICS:
  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<<<<<
  >>>>>(STREET TABLE SECTION # 18 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1825.00  DOWNSTREAM ELEVATION(FEET) = 1770.00
  STREET LENGTH(FEET) =  1298.78   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) =   0.77

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     112.98
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.71
    HALFSTREET FLOOD WIDTH(FEET) =   27.95
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.34
    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
  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        6.56      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       75.29      0.75     0.900    56
  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) =   30.09
  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) =     121.74

  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) = 0.72   HALFSTREET FLOOD WIDTH(FEET) =  28.62
  FLOW VELOCITY(FEET/SEC.) =  7.53   DEPTH*VELOCITY(FT*FT/SEC.) =   5.42
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1298.8 FT WITH ELEVATION-DROP =  55.0 FT, IS  141.9 CFS,
         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.

****************************************************************************
  FLOW PROCESS FROM NODE  20373.00 TO NODE  20374.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>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) =     133.30
    ***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.) =    7.48
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.59
  STREET FLOW TRAVEL TIME(MIN.) =   2.97   Tc(MIN.) =   59.50
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  0.975
  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        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) =   23.09
  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) =     136.53

  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) = 0.75   HALFSTREET FLOOD WIDTH(FEET) =  30.27
  FLOW VELOCITY(FEET/SEC.) =  7.54   DEPTH*VELOCITY(FT*FT/SEC.) =   5.67
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1333.5 FT WITH ELEVATION-DROP =  50.0 FT, IS  119.3 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) =     147.21
    ***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.) =    8.33
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.21
  STREET FLOW TRAVEL TIME(MIN.) =   2.56   Tc(MIN.) =   62.06
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  0.951
  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        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
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  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      Fp         Ap     SCS
       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"         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 AREA(ACRES) =   97.27      SUBAREA RUNOFF(CFS) =   26.62
  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
```



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  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  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      Q        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.
   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) = 16.58  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:
```

```
  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
```

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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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             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 20454                     *
* 25-YR  HC ULTIMATE CONDITION    OCT 2013   DMALOTT                    *
 ************************************************************************

  FILE NAME: LR0204ZZ.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

  *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
```



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 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  20400.00 TO NODE  20401.00 IS CODE =  21
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   924.07
  ELEVATION DATA: UPSTREAM(FEET) =   1720.00  DOWNSTREAM(FEET) =   1670.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.338
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.636
  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
  ".4 DWELLING/ACRE"         B        0.14      0.75     0.900    56   13.40
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       10.27      0.75     0.600    56   11.34
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.604
  SUBAREA RUNOFF(CFS) =     20.46
  TOTAL AREA(ACRES) =     10.41   PEAK FLOW RATE(CFS) =     20.46

  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  20401.00 TO NODE  20402.00 IS CODE =  63
------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
========================================================================
  UPSTREAM ELEVATION(FEET) = 1670.00  DOWNSTREAM ELEVATION(FEET) = 1657.00
  STREET LENGTH(FEET) =   293.15   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00
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  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  10.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      28.39
    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         Ap     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) =      35.16

  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) = 0.48   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
```



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  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.76      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) =    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
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  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      Fp         Ap     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) =   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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
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 "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) =      75.11
   ***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         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 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
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  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) =      86.29
    ***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) =      83.06

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

  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.
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****************************************************************************
  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      Fp         Ap     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
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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) =     135.44
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.74
  HALFSTREET FLOOD WIDTH(FEET) =   29.84
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.70
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.72
STREET FLOW TRAVEL TIME(MIN.) =   1.08   Tc(MIN.) =   23.52
*  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.701
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       51.42      0.75     0.600    56
COMMERCIAL                 B        4.09      0.75     0.100    56
RESIDENTIAL
".4 DWELLING/ACRE"         B        0.43      0.75     0.900    56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.566
SUBAREA AREA(ACRES) =   55.94      SUBAREA RUNOFF(CFS) =   64.34
EFFECTIVE AREA(ACRES) =    144.19    AREA-AVERAGED Fm(INCH/HR) =  0.44
AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.59
TOTAL AREA(ACRES) =      144.2        PEAK FLOW RATE(CFS) =     163.75

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) = 0.78   HALFSTREET FLOOD WIDTH(FEET) =  31.80
FLOW VELOCITY(FEET/SEC.) =  8.19   DEPTH*VELOCITY(FT*FT/SEC.) =   6.41

*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.) =  13.29
PIPE-FLOW(CFS) =      41.77
PIPEFLOW TRAVEL TIME(MIN.) =   0.63    Tc(MIN.) =  23.07
*  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.721
SUBAREA AREA(ACRES) =   55.94      SUBAREA RUNOFF(CFS) =   65.35
TOTAL AREA(ACRES) =      144.2        PEAK FLOW RATE(CFS) =     166.34

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.73
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  STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.01      0.61     1.000    66
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       52.45      0.75     0.600    56
  PUBLIC PARK                B        0.03      0.75     0.850    56
  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:
```

```
  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      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        B       25.52      0.75      0.600    56
  PUBLIC PARK                 B        5.30      0.75      0.850    56
  SCHOOL                      B        8.19      0.75      0.600    56
  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.
   EQUIVALENT 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
```

```
****************************************************************************
  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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      211.99   25.02    1.640  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= 0.39;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) =     4864.2
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  20410.00 =   25767.42 FEET.
   EQUIVALENT 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 SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   45.60
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.144
  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       25.77      0.75      0.600    56
  PUBLIC PARK                B        1.54      0.75      0.850    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.79      0.61      1.000    66
  COMMERCIAL                 B        0.05      0.75      0.100    56
  MOBILE HOME PARK           B        5.02      0.75      0.250    56
  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= 0.39;30M= 0.80;1H= 1.05;3H= 1.85;6H= 2.63;24H= 5.88
  S-GRAPH: VALLEY(DEV.)= 44.8%;VALLEY(UNDEV.)/DESERT= 55.2%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.76; LAG(HR) = 0.61; 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) =     4897.4
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  20452.00 =   27096.44 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) = 16.58  RUNOFF VOLUME(AF) =    1055.79
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    2795.39
  TOTAL AREA(ACRES) =     4897.4       PEAK FLOW RATE(CFS) =    2813.02
  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  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

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.027
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.680
  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
  "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) =     10.56
  TOTAL AREA(ACRES) =      4.91   PEAK FLOW RATE(CFS) =     10.56

  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  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
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.365
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK          A        2.50      0.98     0.250    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"      A        0.99      0.98     0.600    32
  COMMERCIAL                A        2.87      0.98     0.100    32
  COMMERCIAL                B        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) =     20.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.19
  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(ACRES) =   10.23       SUBAREA RUNOFF(CFS) =   19.50
  EFFECTIVE AREA(ACRES) =   15.14     AREA-AVERAGED Fm(INCH/HR) =   0.26
  AREA-AVERAGED Fp(INCH/HR) =   0.90  AREA-AVERAGED Ap =   0.29
  TOTAL AREA(ACRES) =       15.1         PEAK FLOW RATE(CFS) =      28.66

  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) =  0.64   FLOOD WIDTH(FEET) =   37.28
  FLOW VELOCITY(FEET/SEC.) =   4.38   DEPTH*VELOCITY(FT*FT/SEC) =   2.81
  LONGEST FLOWPATH FROM NODE  20420.00 TO NODE  20422.00 =    1218.93 FEET.

****************************************************************************
  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) =      35.68
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.51
    HALFSTREET FLOOD WIDTH(FEET) =   17.51
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.48
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.79
  STREET FLOW TRAVEL TIME(MIN.) =   0.91   Tc(MIN.) =   14.50
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.274
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK          A        2.62      0.98     0.250    32
  SCHOOL                    A        0.15      0.98     0.600    32
  COMMERCIAL                A        1.21      0.98     0.100    32
  COMMERCIAL                B        2.01      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"      B        1.63      0.75     0.600    56
  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) =   14.04
  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) =      41.48

  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) = 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.

****************************************************************************
  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) = 32.00

  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) =      46.25
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.56
    HALFSTREET FLOOD WIDTH(FEET) =   20.32
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.35
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.02
  STREET FLOW TRAVEL TIME(MIN.) =   0.80   Tc(MIN.) =   15.30
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.202
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           A        0.47      0.98     0.250    32
  MOBILE HOME PARK           B        0.58      0.75     0.250    56
  COMMERCIAL                 B        2.83      0.75     0.100    56
  COMMERCIAL                 A        0.03      0.98     0.100    32
  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) =    9.55
  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) =      49.54

  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) = 0.58   HALFSTREET FLOOD WIDTH(FEET) =  20.87
  FLOW VELOCITY(FEET/SEC.) =  5.45   DEPTH*VELOCITY(FT*FT/SEC.) =   3.14
  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

  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
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  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) =      52.36
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.58
    HALFSTREET FLOOD WIDTH(FEET) =   21.26
    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
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.152
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        0.06      0.75     0.250    56
  COMMERCIAL                 B        1.63      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.63      0.75     0.600    56
  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) =    5.65
  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) =      53.94

  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) = 0.59   HALFSTREET FLOOD WIDTH(FEET) =  21.49
  FLOW VELOCITY(FEET/SEC.) =  5.61   DEPTH*VELOCITY(FT*FT/SEC.) =   3.30
  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
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.943
  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        1.17      0.75     0.600    56
  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
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  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     60.68
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.71
  AVERAGE FLOW DEPTH(FEET) =   0.78   FLOOD WIDTH(FEET) =   53.71
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   2.96   Tc(MIN.) =   18.85
  SUBAREA AREA(ACRES) =    9.56       SUBAREA RUNOFF(CFS) =   13.50
  EFFECTIVE AREA(ACRES) =   40.94     AREA-AVERAGED Fm(INCH/HR) =   0.27
  AREA-AVERAGED Fp(INCH/HR) =   0.87  AREA-AVERAGED Ap =   0.31
  TOTAL AREA(ACRES) =       40.9         PEAK FLOW RATE(CFS) =      61.53

  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 "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.78   FLOOD WIDTH(FEET) =   54.01
  FLOW VELOCITY(FEET/SEC.) =   4.72   DEPTH*VELOCITY(FT*FT/SEC) =   3.70
  LONGEST FLOWPATH FROM NODE  20420.00 TO NODE  20426.00 =    2808.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20426.00 TO NODE  20427.00 IS CODE =  92
----------------------------------------------------------------------------
  >>>>>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
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.896
  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"       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) =     66.79
  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
  SUBAREA AREA(ACRES) =    8.26       SUBAREA RUNOFF(CFS) =   10.52
  EFFECTIVE AREA(ACRES) =   49.20     AREA-AVERAGED Fm(INCH/HR) =   0.31
  AREA-AVERAGED Fp(INCH/HR) =   0.89  AREA-AVERAGED Ap =   0.34
  TOTAL AREA(ACRES) =       49.2         PEAK FLOW RATE(CFS) =      70.31

  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 "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.74   FLOOD WIDTH(FEET) =   48.33
  FLOW VELOCITY(FEET/SEC.) =   6.66   DEPTH*VELOCITY(FT*FT/SEC) =   4.89
  LONGEST FLOWPATH FROM NODE  20420.00 TO NODE  20427.00 =    3120.11 FEET.

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  FLOW PROCESS FROM NODE  20472.00 TO NODE  20473.00 IS CODE =  92
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  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
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.853
  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
  "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) =     75.94
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.53
  AVERAGE FLOW DEPTH(FEET) =   0.76   FLOOD WIDTH(FEET) =   50.87
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.77   Tc(MIN.) =   20.41
  SUBAREA AREA(ACRES) =    8.95       SUBAREA RUNOFF(CFS) =   11.27
  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) =      79.67

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 6.50

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.77   FLOOD WIDTH(FEET) =   51.91
  FLOW VELOCITY(FEET/SEC.) =   6.59   DEPTH*VELOCITY(FT*FT/SEC) =   5.05
  LONGEST FLOWPATH FROM NODE  20420.00 TO NODE  20473.00 =    3421.05 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20428.00 TO NODE  20429.00 IS CODE =  92
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =   1668.00
  DOWNSTREAM NODE ELEVATION(FEET) =   1664.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   362.53
  "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) =  1.787
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        0.97      0.98     0.100    32
  RESIDENTIAL
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  "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
  "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

  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) =  0.90   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<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =     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
    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
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A       21.36      0.98     0.600    32
  COMMERCIAL                 A        7.94      0.98     0.100    32
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  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):
  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
  *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.

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  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) =     144.15
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  1.16
    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):
   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
  "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) =   12.15
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  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 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
  "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) =      9.99

  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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) =    7.27
```

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  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) =      14.89

  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      Fp         Ap     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
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  FLOW VELOCITY(FEET/SEC.) =  2.24   DEPTH*VELOCITY(FT*FT/SEC.) =   1.28
  *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      Fp         Ap     SCS
       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
----------------------------------------------------------------------------
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  >>>>>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) =      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
       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) =   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) =      40.86

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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         Ap     SCS
       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
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  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =  0.62
    HALFSTREET 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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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                     B        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 AREA(ACRES) =   31.80      SUBAREA RUNOFF(CFS) =   21.57
  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) = 26.00

  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) =      84.29
```



```
    ***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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        9.63      0.98     0.600    32
  COMMERCIAL                 A       12.07      0.98     0.100    32
  COMMERCIAL                 B        0.31      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.23      0.75     0.600    56
  SCHOOL                     B       11.63      0.75     0.600    56
  SCHOOL                     A        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
```

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  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.75
  HALFSTREET FLOOD WIDTH(FEET) =   29.96
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.01
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.48
 STREET FLOW TRAVEL TIME(MIN.) =   2.27   Tc(MIN.) =   40.93
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.220
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 A        3.48      0.98     0.100    32
 COMMERCIAL                 B        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                     A        0.64      0.98     0.600    32
 SCHOOL                     B       16.30      0.75     0.600    56
 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) =   23.08
 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) =     113.13

 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) =  30.51
 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.

****************************************************************************
 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.) =   40.93
 RAINFALL INTENSITY(INCH/HR) =   1.22
 AREA-AVERAGED Fm(INCH/HR) =  0.43
 AREA-AVERAGED Fp(INCH/HR) =  0.81
 AREA-AVERAGED Ap =  0.53
 EFFECTIVE STREAM AREA(ACRES) =     159.38
 TOTAL STREAM AREA(ACRES) =     159.38
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     113.13

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1      138.07   29.36    1.489  0.94( 0.36) 0.38     132.2   20420.00
     2      113.13   40.93    1.220  0.81( 0.43) 0.53     159.4   20440.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
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 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      246.92   29.36    1.489  0.87( 0.39) 0.45     246.6   20420.00
     2      218.43   40.93    1.220  0.86( 0.40) 0.46     291.6   20440.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     246.92    Tc(MIN.) =    29.36
 EFFECTIVE AREA(ACRES) =     246.56   AREA-AVERAGED Fm(INCH/HR) =  0.39
 AREA-AVERAGED Fp(INCH/HR) =  0.87  AREA-AVERAGED Ap =  0.45
 TOTAL AREA(ACRES) =      291.6
 LONGEST FLOWPATH FROM NODE  20420.00 TO NODE  20449.00 =    6496.84 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  20449.00 TO NODE  20450.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION # 18 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1625.00  DOWNSTREAM ELEVATION(FEET) = 1595.00
 STREET LENGTH(FEET) =  1304.02   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) =   0.89

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     300.42
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  1.02
   HALFSTREET FLOOD WIDTH(FEET) =   43.58
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.96
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    8.10
 STREET FLOW TRAVEL TIME(MIN.) =   2.73   Tc(MIN.) =   32.09
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.412
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      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
 COMMERCIAL                 B       19.61      0.75     0.100    56
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 B        9.23      0.63     1.000    65
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        8.18      0.75     0.600    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A        7.04      0.98     0.600    32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.77
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.292
```

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 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
     1      344.69   30.78    1.448  0.85( 0.34) 0.40     346.7   20420.00
     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
```



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 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         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B       19.78      0.75     0.600    56
 COMMERCIAL                 B        5.95      0.75     0.100    56
 MOBILE HOME PARK           B        6.72      0.75     0.250    56
 PUBLIC PARK                B        6.76      0.75     0.850    56
 SCHOOL                     B        5.51      0.75     0.600    56
 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
```

```
     LAND USE            GROUP   (ACRES)   (INCH/HR)   (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        6.50      0.75      0.600    56
  COMMERCIAL                 B        3.31      0.75      0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        0.25      0.98      0.600    32
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.07      0.61      1.000    66
  PUBLIC PARK                B        0.12      0.75      0.850    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.444
  SUBAREA AREA(ACRES) =   10.25      SUBAREA RUNOFF(CFS) =    8.56
  EFFECTIVE AREA(ACRES) =    401.71   AREA-AVERAGED Fm(INCH/HR) =  0.40
  AREA-AVERAGED Fp(INCH/HR) =  0.83  AREA-AVERAGED Ap =  0.48
  TOTAL AREA(ACRES) =      446.7       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  20452.00 TO NODE  20452.00 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      344.69   38.65    1.263  0.83( 0.35) 0.42     401.7   20420.00
      2      296.13   50.71    1.073  0.83( 0.36) 0.43     446.7   20440.00
  LONGEST FLOWPATH FROM NODE  20420.00 TO NODE  20452.00 =   11995.85 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  PEAK FLOW RATE(CFS) =     2813.02    Tc(MIN.) =   45.60
  AREA-AVERAGED Fm(INCH/HR) =  0.58    Ybar = 0.58
  TOTAL AREA(ACRES) =     4897.4
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  20452.00 =   27096.44 FEET.

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.39;30M= 0.81;1H= 1.07;3H= 1.86;6H= 2.64;24H= 5.91
  S-GRAPH: VALLEY(DEV.)= 49.2%;VALLEY(UNDEV.)/DESERT= 50.8%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.76; LAG(HR) = 0.61; Fm(INCH/HR) = 0.56; 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= 0.99
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =     5344.1
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  20452.00 =   27096.44 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) = 16.67  RUNOFF VOLUME(AF) =    1200.67
  PEAK FLOW RATE(CFS) =    3127.44

****************************************************************************
  FLOW PROCESS FROM NODE  20452.00 TO NODE  20452.00 IS CODE =  12
----------------------------------------------------------------------------
```



```
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  20452.00 TO NODE  20453.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1510.00  DOWNSTREAM(FEET) =   1440.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  3395.49   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) =    3127.44
  FLOW VELOCITY(FEET/SEC.) =  30.22   FLOW DEPTH(FEET) =   4.79
  TRAVEL TIME(MIN.) =   1.87   Tc(MIN.) =   47.48
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  20453.00 =   30491.93 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20453.00 TO NODE  20453.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   47.48
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.116
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B       20.13      0.75      0.250    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       19.32      0.75      0.600    56
  SCHOOL                     B        8.94      0.75      0.600    56
  COMMERCIAL                 B        4.10      0.75      0.100    56
  PUBLIC PARK                B        1.64      0.75      0.850    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        0.19      0.98      0.600    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.440
  SUBAREA AREA(ACRES) =   54.32
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.39;30M= 0.81;1H= 1.07;3H= 1.85;6H= 2.63;24H= 5.90
  S-GRAPH: VALLEY(DEV.)= 49.7%;VALLEY(UNDEV.)/DESERT= 50.3%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.79; LAG(HR) = 0.63; Fm(INCH/HR) = 0.56; Ybar = 0.56
  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= 0.99
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =     5398.4
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  20453.00 =   30491.93 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0324; Lca/L=0.4,n=.0290; Lca/L=0.5,n=.0267;Lca/L=0.6,n=.0249
  TIME OF PEAK FLOW(HR) = 16.67  RUNOFF VOLUME(AF) =    1214.22
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    3124.52
  TOTAL AREA(ACRES) =     5398.4       PEAK FLOW RATE(CFS) =    3127.44
  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  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.) =   49.44
  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.) =   49.44
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.089
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  SCHOOL                     B       17.44      0.75     0.600    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        3.70      0.75     0.600    56
  PUBLIC PARK                B        9.17      0.75     0.850    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        5.37      0.75     0.500    56
  COMMERCIAL                 B        1.64      0.75     0.100    56
  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= 0.99
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =     5435.8
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  20454.00 =   33620.61 FEET.
   EQUIVALENT 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) =    3127.44
  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  20454.00 TO NODE  20454.00 IS CODE = 152
```



```
----------------------------------------------------------------------------
  >>>>>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
```

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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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             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 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-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 0.0313 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
```



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 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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   15.525
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.183
  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
  "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
  "ORCHARDS"                 A        0.12      0.88      1.000    44   26.60
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.80
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.612
  SUBAREA RUNOFF(CFS) =      6.01
  TOTAL AREA(ACRES) =      3.95   PEAK FLOW RATE(CFS) =      6.01

  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  20501.00 TO NODE  20502.00 IS CODE =  63
------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
========================================================================
  UPSTREAM ELEVATION(FEET) = 1591.00  DOWNSTREAM ELEVATION(FEET) = 1587.00
```

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 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) =       8.75
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.46
   HALFSTREET FLOOD WIDTH(FEET) =   16.48
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.09
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.41
 STREET FLOW TRAVEL TIME(MIN.) =   1.42   Tc(MIN.) =   16.94
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.071
 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        3.30      0.75     0.600    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A        0.37      0.98     0.600    32
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 A        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) =    5.49
 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) =      11.10

 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
 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
----------------------------------------------------------------------------
 >>>>>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
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  10.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020
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 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) =      14.54
   ***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) =    0.23   SPLIT FLOOD WIDTH(FEET) =    5.44
   SPLIT FLOW(CFS) =    0.91   SPLIT VELOCITY(FEET/SEC.) =    2.19
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.49
   HALFSTREET 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.) =   18.16
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.987
 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        2.45      0.75     0.600    56
 MOBILE HOME PARK           B        1.73      0.75     0.250    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A        0.21      0.98     0.600    32
 MOBILE HOME PARK           A        0.20      0.98     0.250    32
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 A        0.11      0.88     1.000    44
 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) =    6.88
 EFFECTIVE AREA(ACRES) =     12.48    AREA-AVERAGED Fm(INCH/HR) =  0.44
 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

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.49   HALFSTREET FLOOD WIDTH(FEET) =  18.00
 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  20503.00 TO NODE  20504.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1580.00  DOWNSTREAM ELEVATION(FEET) = 1570.00
 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
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  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) =   0.86

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      22.24
    ***STREET FLOW SPLITS OVER STREET-CROWN***
    FULL DEPTH(FEET) =    0.49   FLOOD WIDTH(FEET) =   18.00
    FULL HALF-STREET VELOCITY(FEET/SEC.) =    4.10
    SPLIT DEPTH(FEET) =    0.42   SPLIT FLOOD WIDTH(FEET) =   14.84
    SPLIT FLOW(CFS) =    8.48   SPLIT VELOCITY(FEET/SEC.) =    3.66
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.49
    HALFSTREET FLOOD WIDTH(FEET) =   18.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.10
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.99
  STREET FLOW TRAVEL TIME(MIN.) =   1.69   Tc(MIN.) =   19.85
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.884
  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        0.28      0.75     0.600    56
  MOBILE HOME PARK           B        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) =    9.71
  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) =      25.94

  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
  FLOW VELOCITY(FEET/SEC.) =  4.10   DEPTH*VELOCITY(FT*FT/SEC.) =   1.99
  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 =  1
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  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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     SCS
       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) =    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:
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  STREET FLOW DEPTH(FEET) =  0.55
  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
*  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.606
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       14.33      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) =      53.92
   ***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.) =    4.74
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.85
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 STREET FLOW TRAVEL TIME(MIN.) =   3.33   Tc(MIN.) =   29.24
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.493
 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        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) =   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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B       11.25      0.75     0.600    56
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  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) =      62.94

  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) =      63.61
    ***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     SCS
       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
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  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) =  45.47
  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) =      63.51
    ***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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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) =    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.
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****************************************************************************
  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.) =   48.35
  RAINFALL INTENSITY(INCH/HR) =   1.10
  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 =      62.94

****************************************************************************
  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
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.858
  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
  "3-4 DWELLINGS/ACRE"       A        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"       B        0.57      0.75     0.600    56   13.43
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        1.82      0.63     1.000    65   23.01
  COMMERCIAL                 B        0.06      0.75     0.100    56    9.91
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.73
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.897
  SUBAREA RUNOFF(CFS) =      7.27
  TOTAL AREA(ACRES) =      3.67   PEAK FLOW RATE(CFS) =      7.27

  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  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
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  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) =      11.55
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.38
    HALFSTREET FLOOD WIDTH(FEET) =   11.09
    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
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.694
  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        1.59      0.88     1.000    44
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        2.00      0.63     1.000    65
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.46      0.75     0.600    56
  MOBILE HOME PARK           B        0.58      0.75     0.250    56
  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) =    8.55
  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) =      15.28

  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) = 0.41   HALFSTREET FLOOD WIDTH(FEET) =  12.49
  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.

****************************************************************************
  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
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 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =      21.99
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.51
   HALFSTREET FLOOD WIDTH(FEET) =   17.53
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.37
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.71
 STREET FLOW TRAVEL TIME(MIN.) =   1.52   Tc(MIN.) =   12.45
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.492
 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        1.37      0.88     1.000    44
 MOBILE HOME PARK           A        1.25      0.98     0.250    32
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 B        1.07      0.63     1.000    65
 MOBILE HOME PARK           B        2.91      0.75     0.250    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        0.58      0.75     0.600    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.78
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.533
 SUBAREA AREA(ACRES) =    7.18      SUBAREA RUNOFF(CFS) =   13.42
 EFFECTIVE AREA(ACRES) =     15.48    AREA-AVERAGED Fm(INCH/HR) =  0.54
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.72
 TOTAL AREA(ACRES) =       15.5        PEAK FLOW RATE(CFS) =      27.19

 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) = 0.54   HALFSTREET FLOOD WIDTH(FEET) =  19.12
 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.

****************************************************************************
 FLOW PROCESS FROM NODE  20513.00 TO NODE  20514.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION # 18 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1575.00  DOWNSTREAM ELEVATION(FEET) = 1570.00
 STREET LENGTH(FEET) =   416.53   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
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 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) =   1.06

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      37.35
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.62
   HALFSTREET FLOOD WIDTH(FEET) =   22.98
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.41
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.11
 STREET FLOW TRAVEL TIME(MIN.) =   2.03   Tc(MIN.) =   14.48
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.276
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 MOBILE HOME PARK           A        3.78      0.98     0.250    32
 MOBILE HOME PARK           B        6.42      0.75     0.250    56
 RESIDENTIAL
 "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) =   20.33
 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) =      44.51

 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) = 0.65   HALFSTREET FLOOD WIDTH(FEET) =  24.62
 FLOW VELOCITY(FEET/SEC.) =  3.56   DEPTH*VELOCITY(FT*FT/SEC.) =   2.32
 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) =   392.53   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) =      53.54
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.68
   HALFSTREET FLOOD WIDTH(FEET) =   26.67
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.82
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  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.60
 STREET FLOW TRAVEL TIME(MIN.) =   1.71   Tc(MIN.) =   16.19
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.129
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 MOBILE HOME PARK           B        5.83      0.75     0.250    56
 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) =   18.06
 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) =      59.04

 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) = 0.70   HALFSTREET FLOOD WIDTH(FEET) =  27.52
 FLOW VELOCITY(FEET/SEC.) =  3.95   DEPTH*VELOCITY(FT*FT/SEC.) =   2.76
 LONGEST FLOWPATH FROM NODE  20510.00 TO NODE  20515.00 =    1933.74 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) =      83.21
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.69
   HALFSTREET FLOOD WIDTH(FEET) =   26.97
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.81
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.98
 STREET FLOW TRAVEL TIME(MIN.) =   3.49   Tc(MIN.) =   19.68
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.893
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
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 "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) =   48.22
 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) =      99.32

 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) = 0.72   HALFSTREET FLOOD WIDTH(FEET) =  28.50
 FLOW VELOCITY(FEET/SEC.) =  6.20   DEPTH*VELOCITY(FT*FT/SEC.) =   4.44
 LONGEST FLOWPATH FROM NODE  20510.00 TO NODE  20516.00 =    3149.32 FEET.

****************************************************************************
 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

 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) =     117.65
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.80
   HALFSTREET FLOOD WIDTH(FEET) =   32.59
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.60
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.47
 STREET FLOW TRAVEL TIME(MIN.) =   3.32   Tc(MIN.) =   23.00
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.724
 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       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) =   36.60
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  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) =     124.87

  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) = 0.81   HALFSTREET FLOOD WIDTH(FEET) =  33.26
  FLOW VELOCITY(FEET/SEC.) =  5.70   DEPTH*VELOCITY(FT*FT/SEC.) =   4.63
  LONGEST FLOWPATH FROM NODE  20510.00 TO NODE  20517.00 =    4264.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20517.00 TO NODE  20518.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 18 USED)<<<<<
============================================================================
  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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =     143.68
    ***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.) =    5.63
    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
  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
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.600
  SUBAREA AREA(ACRES) =   41.95      SUBAREA RUNOFF(CFS) =   37.59
  EFFECTIVE AREA(ACRES) =    148.93    AREA-AVERAGED Fm(INCH/HR) =  0.47
  AREA-AVERAGED Fp(INCH/HR) =  0.86  AREA-AVERAGED Ap =  0.55
  TOTAL AREA(ACRES) =      148.9        PEAK FLOW RATE(CFS) =     147.34

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82
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  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.87   HALFSTREET FLOOD WIDTH(FEET) =  36.25
  FLOW VELOCITY(FEET/SEC.) =  5.65   DEPTH*VELOCITY(FT*FT/SEC.) =   4.93
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         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
  LONGEST FLOWPATH FROM NODE  20510.00 TO NODE  20518.00 =    5604.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20518.00 TO NODE  20518.00 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.) =   26.97
  RAINFALL INTENSITY(INCH/HR) =   1.57
  AREA-AVERAGED Fm(INCH/HR) =  0.47
  AREA-AVERAGED Fp(INCH/HR) =  0.86
  AREA-AVERAGED Ap =  0.55
  EFFECTIVE STREAM AREA(ACRES) =     148.93
  TOTAL STREAM AREA(ACRES) =     148.93
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     147.34

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      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

  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      207.91   26.97    1.567  0.85( 0.47) 0.55     195.1   20510.00
      2      148.21   48.35    1.104  0.85( 0.47) 0.55     231.7   20500.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     207.91    Tc(MIN.) =    26.97
  EFFECTIVE AREA(ACRES) =     195.10   AREA-AVERAGED Fm(INCH/HR) =  0.47
  AREA-AVERAGED Fp(INCH/HR) =  0.85  AREA-AVERAGED Ap =  0.55
  TOTAL AREA(ACRES) =      231.7
  LONGEST FLOWPATH FROM NODE  20500.00 TO NODE  20518.00 =    7021.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20518.00 TO NODE  20519.00 IS CODE =  33
----------------------------------------------------------------------------
  >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1489.50
  DOWNSTREAM NODE ELEVATION(FEET) =  1440.00
  FLOW LENGTH(FEET) =  2632.61   MANNING'S N =  0.013

  USER SPECIFIED PIPE DIAMETER(INCH) =  60.00    NUMBER OF PIPES =   1
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 DEPTH OF FLOW IN  60.0 INCH PIPE IS  32.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  18.88
 PIPE-FLOW(CFS) =     207.91
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME(MIN.) =   2.47    Tc(MIN.) =  29.44
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.487
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 SCHOOL                     A       21.65      0.98     0.600    32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A       27.03      0.98     0.600    32
 MOBILE HOME PARK           A        8.46      0.98     0.250    32
 SCHOOL                     B        7.51      0.75     0.600    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        5.29      0.75     0.600    56
 MOBILE HOME PARK           B        2.31      0.75     0.250    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.93
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.548
 SUBAREA AREA(ACRES) =   72.25      SUBAREA RUNOFF(CFS) =   63.64
 EFFECTIVE AREA(ACRES) =    267.35    AREA-AVERAGED Fm(INCH/HR) =  0.48
 AREA-AVERAGED Fp(INCH/HR) =  0.87  AREA-AVERAGED Ap =  0.55
 TOTAL AREA(ACRES) =      304.0        PEAK FLOW RATE(CFS) =     242.63

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.63; 6HR = 2.27; 24HR = 4.82

 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) =   34.72
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.57
   HALFSTREET FLOOD WIDTH(FEET) =   20.46
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.97
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.25

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1      242.63   29.44    1.487  0.87( 0.48) 0.55     267.4   20510.00
     2      161.94   51.03    1.069  0.87( 0.48) 0.55     304.0   20500.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     242.63  Tc(MIN.) =   29.44
 AREA-AVERAGED Fm(INCH/HR) =  0.48  AREA-AVERAGED Fp(INCH/HR) =  0.87
 AREA-AVERAGED Ap =  0.55  EFFECTIVE AREA(ACRES) =     267.35
 LONGEST FLOWPATH FROM NODE  20500.00 TO NODE  20519.00 =    9653.93 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  20519.00 TO NODE  20520.00 IS CODE =  33
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----------------------------------------------------------------------------
 >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
 >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
 UPSTREAM NODE ELEVATION(FEET) =  1440.00
 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
 DEPTH OF FLOW IN  66.0 INCH PIPE IS  33.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  19.84
 PIPE-FLOW(CFS) =     242.63
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME(MIN.) =   1.39    Tc(MIN.) =  30.83
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.446
 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       13.85      0.98     0.600    32
 SCHOOL                     A       16.29      0.98     0.600    32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B       15.89      0.75     0.600    56
 PUBLIC PARK                B        9.87      0.75     0.850    56
 SCHOOL                     B       12.11      0.75     0.600    56
 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
 EFFECTIVE AREA(ACRES) =    335.36    AREA-AVERAGED Fm(INCH/HR) =  0.49
 AREA-AVERAGED Fp(INCH/HR) =  0.87  AREA-AVERAGED Ap =  0.57
 TOTAL AREA(ACRES) =      372.0        PEAK FLOW RATE(CFS) =     288.59

 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
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =   45.96
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.61
   HALFSTREET FLOOD WIDTH(FEET) =   22.75
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.28
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.63

 ** PEAK FLOW RATE TABLE **
  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
     2      188.23   52.57    1.050  0.86( 0.49) 0.57     372.0   20500.00
```

```
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     288.59  Tc(MIN.) =   30.83
  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<<<<<
  >>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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        3.22      0.98     0.600    32
  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) =    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
```



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----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  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
  AREA-AVERAGED Ap =  0.57
  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 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
  "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) =      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
```

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  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.58
  ***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.) =    2.45
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.30
 STREET FLOW TRAVEL TIME(MIN.) =   5.25   Tc(MIN.) =   19.80
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.886
 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       21.08      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) =   21.08      SUBAREA RUNOFF(CFS) =   24.69
 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) =      30.93

 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) = 0.59   HALFSTREET FLOOD WIDTH(FEET) =  22.71
 FLOW VELOCITY(FEET/SEC.) =  2.80   DEPTH*VELOCITY(FT*FT/SEC.) =   1.66
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        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
 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  18.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   9.17
 PIPE-FLOW(CFS) =      30.93
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME(MIN.) =   1.86    Tc(MIN.) =  21.67
 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.) =   21.67
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.787
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 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 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) =    3.09
 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) =      31.67

 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  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) =      48.87
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.58
   HALFSTREET FLOOD WIDTH(FEET) =   22.22
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.61
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.69
 STREET FLOW TRAVEL TIME(MIN.) =   4.97   Tc(MIN.) =   26.64
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.579
 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        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) =   34.27
 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) =      60.45
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  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) =      81.32
    ***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         Ap     SCS
       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) =   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      Fp         Ap     SCS
```

```
     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

  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.

****************************************************************************
  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.) =   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

  ** 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.
```



```
  ** 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.

****************************************************************************
  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)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1395.00
  DOWNSTREAM NODE ELEVATION(FEET) =  1394.50
  FLOW LENGTH(FEET) =   877.02   MANNING'S N =  0.013

  USER SPECIFIED PIPE DIAMETER(INCH) = 144.00    NUMBER OF PIPES =   1
  DEPTH OF FLOW IN 144.0 INCH PIPE IS  79.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.91
  PIPE-FLOW(CFS) =     378.84
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   2.63    Tc(MIN.) =  34.46
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.353
  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       13.40      0.75     0.600    56
  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

  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  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         Ap     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"       B        9.02      0.75     0.600    56
  COMMERCIAL                 B        6.87      0.75     0.100    56
  PUBLIC PARK                B        0.38      0.75     0.850    56
  SCHOOL                     B        0.45      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.428
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.02      0.75     0.600    56
  COMMERCIAL                 B        3.73      0.75     0.100    56
  PUBLIC PARK                B        1.42      0.75     0.850    56
  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) =     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  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
```

```
  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) =    3127.44
  FLOW VELOCITY(FEET/SEC.) =  29.65   FLOW DEPTH(FEET) =   4.86
  TRAVEL TIME(MIN.) =   0.83   Tc(MIN.) =   50.28
  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.) =   50.28
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.079
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK                B        2.13      0.75     0.850    56
  SCHOOL                     B        8.75      0.75     0.600    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        3.67      0.75     0.600    56
  COMMERCIAL                 B        0.11      0.75     0.100    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.07      0.75     0.500    56
  MOBILE HOME PARK           B        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= 0.39;30M= 0.81;1H= 1.06;3H= 1.85;6H= 2.63;24H= 5.89
  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.
  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=.0303; Lca/L=0.4,n=.0271; Lca/L=0.5,n=.0249;Lca/L=0.6,n=.0233
  TIME OF PEAK FLOW(HR) = 16.67  RUNOFF VOLUME(AF) =    1225.48
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    3001.02
```



```
  TOTAL AREA(ACRES) =     5454.9       PEAK FLOW RATE(CFS) =    3127.44
  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 =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  PEAK FLOW RATE(CFS) =     3127.44    Tc(MIN.) =   50.28
  AREA-AVERAGED Fm(INCH/HR) =  0.55    Ybar = 0.56
  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      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      378.84   37.18    1.293  0.88( 0.50) 0.57     505.4   20510.00
      2      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
  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= 0.39;30M= 0.80;1H= 1.06;3H= 1.83;6H= 2.60;24H= 5.79
  S-GRAPH: VALLEY(DEV.)= 54.6%;VALLEY(UNDEV.)/DESERT= 45.4%
           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.
  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=.0303; Lca/L=0.4,n=.0271; Lca/L=0.5,n=.0249;Lca/L=0.6,n=.0233
  TIME OF PEAK FLOW(HR) = 16.67  RUNOFF VOLUME(AF) =    1321.94
  PEAK FLOW RATE(CFS) =    3223.65

****************************************************************************
  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.) =     50.28
  AREA-AVERAGED Fm(INCH/HR)=  0.55   Ybar =  0.56
```

PEAK FLOW RATE(CFS) = 3223.65

==========

==========

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

```
 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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             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 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*

  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  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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.086
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.195
  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
  "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
  "OPEN BRUSH"               B        0.30      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) =     14.73
  TOTAL 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
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        0.68      0.75     0.700    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.18      0.75     0.500    56
  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      Fp         Ap     SCS
       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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        1.97      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.08      0.75     0.600    56
  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
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        2.05      0.75     0.700    56
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        3.11      0.75     0.700    56
```



```
  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 =  0.693
  SUBAREA AREA(ACRES) =    3.33      SUBAREA RUNOFF(CFS) =    5.49
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        0.41      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 =  0.659
  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)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   2092.00  DOWNSTREAM(FEET) =   2080.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   203.75   CHANNEL SLOPE =  0.0589
  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.) =   3.89   FLOW DEPTH(FEET) =   0.68
  TRAVEL TIME(MIN.) =   0.87   Tc(MIN.) =   15.43
  LONGEST FLOWPATH FROM NODE  20600.00 TO NODE  20608.00 =    2246.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20608.00 TO NODE  20608.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   15.43
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.169
  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        2.94      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.31      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.656
  SUBAREA AREA(ACRES) =    5.25      SUBAREA RUNOFF(CFS) =    7.93
  EFFECTIVE AREA(ACRES) =     22.16   AREA-AVERAGED Fm(INCH/HR) =  0.51
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.69
  TOTAL AREA(ACRES) =       22.2       PEAK FLOW RATE(CFS) =      33.05

  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  20608.00 TO NODE  20609.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2080.00  DOWNSTREAM(FEET) =   2065.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   358.70   CHANNEL SLOPE =  0.0418
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  15.000
  MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   1.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      33.05
  FLOW VELOCITY(FEET/SEC.) =   3.61   FLOW DEPTH(FEET) =   0.78
  TRAVEL TIME(MIN.) =   1.66   Tc(MIN.) =   17.08
  LONGEST FLOWPATH FROM NODE  20600.00 TO NODE  20609.00 =    2604.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20609.00 TO NODE  20609.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   17.08
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.040
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
  COMMERCIAL                 B        5.77      0.75     0.100    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        7.52      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.91      0.75     0.600    56
  MOBILE HOME PARK           B        1.23      0.75     0.250    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.92      0.75     0.900    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.460
  SUBAREA AREA(ACRES) =   16.35      SUBAREA RUNOFF(CFS) =   24.95
  EFFECTIVE AREA(ACRES) =     38.51   AREA-AVERAGED Fm(INCH/HR) =  0.44
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.59
  TOTAL AREA(ACRES) =       38.5       PEAK FLOW RATE(CFS) =      55.43

  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  20609.00 TO NODE  20610.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2065.00  DOWNSTREAM ELEVATION(FEET) = 2060.00
  STREET LENGTH(FEET) =   360.92   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) =      59.65
    ***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.) =    4.44
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.86
  STREET FLOW TRAVEL TIME(MIN.) =   1.36   Tc(MIN.) =   18.44
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.949
  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        1.29      0.75     0.500    56
  COMMERCIAL                 B        2.79      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.24      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        0.95      0.75     0.700    56
  MOBILE HOME PARK           B        0.22      0.75     0.250    56
```

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  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) =      71.88
    ***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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.30      0.75     0.500    56
  COMMERCIAL                 B        1.71      0.75     0.100    56
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        1.66      0.75     0.400    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.04      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       12.96      0.75     0.700    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.604
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  SUBAREA AREA(ACRES) =   17.67      SUBAREA RUNOFF(CFS) =   22.37
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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"         B       37.07      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        6.98      0.75     0.600    56
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        0.01      0.75     0.400    56
  NATURAL FAIR COVER
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"OPEN BRUSH"                B        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
```



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MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) =   0.90

  **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      Fp         Ap      SCS
     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
RESIDENTIAL
"5-7 DWELLINGS/ACRE"        B        0.53      0.75     0.500    56
COMMERCIAL                  B        2.00      0.75     0.100    56
RESIDENTIAL
"2 DWELLINGS/ACRE"          B        1.58      0.75     0.700    56
RESIDENTIAL
"3-4 DWELLINGS/ACRE"        B        0.26      0.75     0.600    56
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.

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 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) =     136.13
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.92
   HALFSTREET 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"       B        0.63      0.75     0.500    56
 COMMERCIAL                 B        2.36      0.75     0.100    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        0.24      0.75     0.600    56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        2.47      0.75     0.700    56
 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 =  0.59
 TOTAL 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
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 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.29
 PIPE-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 Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =  109.85
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.86
   HALFSTREET FLOOD WIDTH(FEET) =   35.90
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.15
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.56
 LONGEST FLOWPATH FROM NODE  20600.00 TO NODE  20614.00 =    4472.43 FEET.

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 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) =  0.90
   HALFSTREET 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"       B        0.61      0.75     0.500    56
 COMMERCIAL                 B        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    56
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  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 Tc :
  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.

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  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:
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    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        2.51      0.75     0.500    56
  COMMERCIAL                 B        0.24      0.75     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 Tc :
  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.

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  FLOW PROCESS FROM NODE  20616.00 TO NODE  20648.00 IS CODE =  63
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 >>>>>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) =     151.61
   ***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.) =    7.77
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.85
 STREET FLOW TRAVEL TIME(MIN.) =   1.12   Tc(MIN.) =   25.73
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.595
 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        2.43      0.75     0.500    56
 COMMERCIAL                 B        2.02      0.75     0.100    56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        3.04      0.75     0.700    56
 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 AREA(ACRES) =    7.76      SUBAREA RUNOFF(CFS) =    8.65
 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) =     150.62

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.75   HALFSTREET FLOOD WIDTH(FEET) =  30.59
 FLOW VELOCITY(FEET/SEC.) =  7.75   DEPTH*VELOCITY(FT*FT/SEC.) =   5.82
 ** 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.) =  12.94
 PIPE-FLOW(CFS) =      51.48
 PIPEFLOW TRAVEL TIME(MIN.) =   0.67    Tc(MIN.) =  25.29
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.612
 SUBAREA AREA(ACRES) =    7.76      SUBAREA RUNOFF(CFS) =    8.76
 TOTAL AREA(ACRES) =      144.5        PEAK FLOW RATE(CFS) =     152.81
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 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      Fp         Ap     SCS   Tc
      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
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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        3.73      0.61     1.000    66
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        1.57      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.62      0.75     0.600    56
  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) =      28.39

  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        3.20      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.56      0.61     1.000    66
```



```
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        1.58      0.75     0.400    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.74      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) =  0.73
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.631
  SUBAREA AREA(ACRES) =    8.16      SUBAREA RUNOFF(CFS) =   12.32
  EFFECTIVE AREA(ACRES) =     27.32   AREA-AVERAGED Fm(INCH/HR) =  0.55
  AREA-AVERAGED Fp(INCH/HR) =  0.66  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =       27.3       PEAK FLOW RATE(CFS) =      39.16

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89

****************************************************************************
  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) =      39.16
  FLOW VELOCITY(FEET/SEC.) =   2.30   FLOW DEPTH(FEET) =   0.70
  TRAVEL TIME(MIN.) =   1.82   Tc(MIN.) =   17.58
  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.) =   17.58
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.005
  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        4.38      0.75     0.400    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        5.30      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        1.08      0.75     0.900    56
  CONDOMINIUMS               B        0.14      0.75     0.350    56
  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) =   15.66
  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) =      51.48

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89
```

```
****************************************************************************
  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
  MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   1.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      51.48
  FLOW VELOCITY(FEET/SEC.) =   2.88   FLOW DEPTH(FEET) =   0.71
  TRAVEL TIME(MIN.) =   1.92   Tc(MIN.) =   19.50
  LONGEST FLOWPATH FROM NODE  20620.00 TO NODE  20625.00 =    1964.97 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20625.00 TO NODE  20625.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   19.50
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.884
  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        5.47      0.75     0.600    56
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        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) =    7.29
  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) =      54.61

  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  20625.00 TO NODE  20626.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2130.00  DOWNSTREAM ELEVATION(FEET) = 2116.00
  STREET LENGTH(FEET) =   342.35   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) =   0.74
```



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    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      57.79
    ***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.) =    6.39
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.50
  STREET FLOW TRAVEL TIME(MIN.) =   0.89   Tc(MIN.) =   20.40
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.834
  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        0.09      0.75     0.400    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.68      0.75     0.600    56
  MOBILE HOME PARK           B        0.24      0.75     0.250    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.04      0.75     0.900    56
  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) =    6.36
  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) =      59.00

  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) = 0.55   HALFSTREET FLOOD WIDTH(FEET) =  20.51
  FLOW VELOCITY(FEET/SEC.) =  6.45   DEPTH*VELOCITY(FT*FT/SEC.) =   3.55
  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
  STREET HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      61.35
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
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    STREET FLOW DEPTH(FEET) =  0.65
    HALFSTREET FLOOD WIDTH(FEET) =   25.40
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.50
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.92
  STREET FLOW TRAVEL TIME(MIN.) =   1.57   Tc(MIN.) =   21.97
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.754
  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        0.03      0.75     0.400    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.50      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        1.53      0.75     0.900    56
  MOBILE HOME PARK           B        0.07      0.75     0.250    56
  COMMERCIAL                 B        0.09      0.75     0.100    56
  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) =    4.70
  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) =      60.18

  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) = 0.64   HALFSTREET FLOOD WIDTH(FEET) =  25.21
  FLOW VELOCITY(FEET/SEC.) =  4.47   DEPTH*VELOCITY(FT*FT/SEC.) =   2.88
  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) =      63.32
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.79
    HALFSTREET FLOOD WIDTH(FEET) =   32.66
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.87
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    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.28
  STREET FLOW TRAVEL TIME(MIN.) =   2.83   Tc(MIN.) =   24.80
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.631
  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        1.07      0.75     0.400    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        2.66      0.75     0.900    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.65      0.75     0.600    56
  COMMERCIAL                 B        0.68      0.75     0.100    56
  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) =    6.28
  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) =      60.58

  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) = 0.78   HALFSTREET FLOOD WIDTH(FEET) =  32.11
  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.

****************************************************************************
  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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      63.35
    ***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.) =    5.10
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.18
  STREET FLOW TRAVEL TIME(MIN.) =   0.84   Tc(MIN.) =   25.64
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.599
  SUBAREA LOSS RATE DATA(AMC  II):
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 DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      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"          B        0.92      0.75      0.900    56
RESIDENTIAL
"3-4 DWELLINGS/ACRE"        B        3.13      0.75      0.600    56
COMMERCIAL                  B        0.27      0.75      0.100    56
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) =    5.52
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) =      64.39

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) = 0.63   HALFSTREET FLOOD WIDTH(FEET) =  24.30
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  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) =      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
RESIDENTIAL
```



```
"8-10 DWELLINGS/ACRE"       B        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
COMMERCIAL                  B        1.62      0.75      0.100    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) =    9.31
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) =      71.89

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.64   HALFSTREET FLOOD WIDTH(FEET) =  24.91
FLOW VELOCITY(FEET/SEC.) =  5.47   DEPTH*VELOCITY(FT*FT/SEC.) =   3.49
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
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) =      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
".4 DWELLING/ACRE"          B        0.22      0.75      0.900    56
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  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.91      0.75     0.600    56
  COMMERCIAL                 B        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) =   10.11
  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) =      79.68

  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) = 0.64   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  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) =      83.33
    ***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.) =    6.40
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.07
  STREET FLOW TRAVEL TIME(MIN.) =   0.71   Tc(MIN.) =   28.23
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.509
  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        0.65      0.75     0.400    56
  CONDOMINIUMS               B        1.64      0.75     0.350    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        3.35      0.75     0.600    56
  COMMERCIAL                 B        1.11      0.75     0.100    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.16      0.75     0.900    56
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  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) =    7.30
  EFFECTIVE AREA(ACRES) =     88.94    AREA-AVERAGED Fm(INCH/HR) =  0.44
  AREA-AVERAGED Fp(INCH/HR) =  0.71  AREA-AVERAGED Ap =  0.63
  TOTAL AREA(ACRES) =       88.9        PEAK FLOW RATE(CFS) =      85.27

  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) = 0.64   HALFSTREET FLOOD WIDTH(FEET) =  25.03
  FLOW VELOCITY(FEET/SEC.) =  6.43   DEPTH*VELOCITY(FT*FT/SEC.) =   4.12
  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) =      97.57
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.69
    HALFSTREET FLOOD WIDTH(FEET) =   27.47
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.16
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.25
  STREET FLOW TRAVEL TIME(MIN.) =   0.68   Tc(MIN.) =   28.91
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.488
  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        4.07      0.75     0.400    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        3.86      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       20.53      0.75     0.900    56
  COMMERCIAL                 B        1.08      0.75     0.100    56
  MOBILE HOME PARK           B        0.18      0.75     0.250    56
  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) =   24.60
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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        0.22      0.75     0.400    56
  COMMERCIAL                 B        0.35      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
```



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  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      Fp         Ap     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) =     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)<<<<<
============================================================================
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```
 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) =      21.73
   ***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      Fp         Ap     SCS
      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
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 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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      Fp         Ap     SCS
      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<<<<<
```

```
================================================================================
  MAINLINE Tc(MIN.) =   17.39
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.018
  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        1.89      0.75     0.400    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.02      0.75     0.600    56
  COMMERCIAL                 B        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) =    3.14
  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) =      26.26

  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  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.) =   17.39
  RAINFALL INTENSITY(INCH/HR) =   2.02
  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 =      26.26

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      108.25   29.11    1.482  0.72( 0.47) 0.66     119.3   20620.00
      2       26.26   17.39    2.018  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      125.37   17.39    2.018  0.72( 0.45) 0.63      88.9   20640.00
      2      126.00   29.11    1.482  0.72( 0.46) 0.64     137.0   20620.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     126.00    Tc(MIN.) =    29.11
  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
```



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  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

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =     134.71
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.70
    HALFSTREET FLOOD WIDTH(FEET) =   28.02
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    8.20
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.74
  STREET FLOW TRAVEL TIME(MIN.) =   0.45   Tc(MIN.) =   29.56
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.468
  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        0.33      0.75     0.400    56
  COMMERCIAL                 B        2.57      0.75     0.100    56
  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
  MOBILE HOME PARK           B        0.01      0.75     0.250    56
  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
  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) =     141.75

  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) = 0.71   HALFSTREET FLOOD WIDTH(FEET) =  28.57
  FLOW VELOCITY(FEET/SEC.) =  8.31   DEPTH*VELOCITY(FT*FT/SEC.) =   5.91
  ** PIPE SIZED TO CARRY TOTAL UPSTREAM PIPEFLOW **
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  ASSUME FULL-FLOWING PIPELINE
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  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.38
  PIPE-FLOW(CFS) =      42.08
  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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   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
      2      142.48   29.38    1.473  0.72( 0.46) 0.64     156.4   20620.00
  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
```



```
  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        9.08      0.75     0.400    56
  COMMERCIAL                  B        5.79      0.75     0.100    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"        B        0.74      0.75     0.500    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"          B        0.22      0.75     0.900    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.302
  SUBAREA AREA(ACRES) =   15.83      SUBAREA RUNOFF(CFS) =   24.72
  EFFECTIVE AREA(ACRES) =    124.25    AREA-AVERAGED Fm(INCH/HR) =  0.61
  AREA-AVERAGED Fp(INCH/HR) =  0.72  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =      172.3        PEAK FLOW RATE(CFS) =     151.11

  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) = 0.72   HALFSTREET FLOOD WIDTH(FEET) =  29.00
  FLOW VELOCITY(FEET/SEC.) =  8.61   DEPTH*VELOCITY(FT*FT/SEC.) =   6.20
  ** 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.) =  13.74
  PIPE-FLOW(CFS) =      43.22
  PIPEFLOW TRAVEL TIME(MIN.) =   0.37    Tc(MIN.) =  18.04
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.975
  SUBAREA AREA(ACRES) =   15.83      SUBAREA RUNOFF(CFS) =   24.91
  TOTAL AREA(ACRES) =      172.3        PEAK FLOW RATE(CFS) =     152.62

  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) =  109.40
    ***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.) =    7.92
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.16

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      173.10   18.04    1.975  0.72( 0.43) 0.59     124.2   20640.00
      2      158.56   29.75    1.462  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/HR) =  0.43  AREA-AVERAGED Fp(INCH/HR) =  0.72
  AREA-AVERAGED Ap =  0.59  EFFECTIVE AREA(ACRES) =     124.25
  LONGEST FLOWPATH FROM NODE  20620.00 TO NODE  20646.00 =    5268.81 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20646.00 TO NODE  20647.00 IS CODE =  31
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2046.00  DOWNSTREAM(FEET) =  2030.00
  FLOW LENGTH(FEET) =   325.06   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  29.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  23.97
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  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  20647.00 TO NODE  20647.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   18.26
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.960
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B       20.06      0.75     0.250    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       29.79      0.75     0.900    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       14.97      0.75     0.600    56
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B       13.31      0.75     0.400    56
  COMMERCIAL                 B       16.98      0.75     0.100    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B       17.61      0.75     0.500    56
  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) =  160.70
  EFFECTIVE AREA(ACRES) =    236.97   AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.73  AREA-AVERAGED Ap =  0.68
  TOTAL AREA(ACRES) =      285.0       PEAK FLOW RATE(CFS) =     311.67

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 4.89

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      332.15   18.26    1.960  0.73( 0.40) 0.55     237.0   20640.00
      2      267.03   29.98    1.456  0.73( 0.41) 0.57     285.0   20620.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     332.15  Tc(MIN.) =   18.26
  AREA-AVERAGED Fm(INCH/HR) =  0.40  AREA-AVERAGED Fp(INCH/HR) =  0.73
  AREA-AVERAGED Ap =  0.55  EFFECTIVE AREA(ACRES) =     236.97

****************************************************************************
  FLOW PROCESS FROM NODE  20647.00 TO NODE  20648.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```



```
  ELEVATION DATA: UPSTREAM(FEET) =  2030.00  DOWNSTREAM(FEET) =  2025.00
  FLOW LENGTH(FEET) =   149.90   MANNING'S N =  0.013
  DEPTH OF FLOW IN  57.0 INCH PIPE IS  41.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  24.31
  ESTIMATED PIPE DIAMETER(INCH) =  57.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     332.15
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =   18.37
  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.) =   18.37
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.953
  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        0.31      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) =    0.44
  EFFECTIVE AREA(ACRES) =    237.28   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) =     332.15
  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

****************************************************************************
  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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (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
      2      267.03   30.09    1.452  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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      152.81   25.29    1.612  0.75( 0.44) 0.58     144.5   20600.00
  LONGEST FLOWPATH FROM NODE  20600.00 TO NODE  20648.00 =    5637.07 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      475.34   18.37    1.953  0.74( 0.41) 0.56     342.2   20640.00
      2      446.54   25.29    1.612  0.74( 0.42) 0.57     410.1   20600.00
      3      399.06   30.09    1.452  0.74( 0.42) 0.57     429.8   20620.00
    TOTAL AREA(ACRES) =       429.8
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        2.58      0.75     0.500    56
  COMMERCIAL                 B        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"               B        0.08      0.61     1.000    66
  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
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  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<<<<<
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  >>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
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.902
  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        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) =     15.42
  TOTAL AREA(ACRES) =      7.15   PEAK FLOW RATE(CFS) =     15.42

  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  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) =      24.25
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.38
    HALFSTREET FLOOD WIDTH(FEET) =   12.73
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.98
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.66
  STREET FLOW TRAVEL TIME(MIN.) =   0.89   Tc(MIN.) =   10.39
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.750
  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        7.90      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.89      0.75     0.600    56
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  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) =   17.67
  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) =      32.10

  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) = 0.41   HALFSTREET FLOOD WIDTH(FEET) =  14.21
  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.

****************************************************************************
  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) =      39.29
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.43
    HALFSTREET FLOOD WIDTH(FEET) =   15.15
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    8.14
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.49
  STREET FLOW TRAVEL TIME(MIN.) =   0.87   Tc(MIN.) =   11.26
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.619
  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        6.22      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.35      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) =     7.57      SUBAREA RUNOFF(CFS) =   14.37
  EFFECTIVE AREA(ACRES) =     23.51    AREA-AVERAGED Fm(INCH/HR) =  0.51
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.68
  TOTAL AREA(ACRES) =       23.5        PEAK FLOW RATE(CFS) =      44.61

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        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.

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  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) =      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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        0.22      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.46      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        1.74      0.75     0.700    56
  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
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  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) =      52.10
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.51
    HALFSTREET FLOOD WIDTH(FEET) =   18.32
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.00
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.54
  STREET FLOW TRAVEL TIME(MIN.) =   0.39   Tc(MIN.) =   13.38
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.362
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       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) =    0.84
  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) =      51.67
  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) = 0.51   HALFSTREET FLOOD WIDTH(FEET) =  18.32
  FLOW VELOCITY(FEET/SEC.) =  6.94   DEPTH*VELOCITY(FT*FT/SEC.) =   3.52
  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.) =   13.38
  RAINFALL INTENSITY(INCH/HR) =   2.36
  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 =      51.67
```



```
  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      475.34   19.18    1.903  0.74( 0.41) 0.56     349.0   20640.00
      1      446.54   26.11    1.582  0.74( 0.42) 0.56     416.9   20600.00
      1      399.06   30.91    1.429  0.74( 0.42) 0.57     436.6   20620.00
      2       51.67   13.38    2.362  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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   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
      2      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
      4      424.80   30.91    1.429  0.74( 0.43) 0.58     467.2   20620.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     514.25    Tc(MIN.) =    19.18
  EFFECTIVE AREA(ACRES) =     379.69   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) =     516.75
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  1.19
    HALFSTREET FLOOD WIDTH(FEET) =   52.44
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    9.27
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   11.02
  STREET FLOW TRAVEL TIME(MIN.) =   0.43   Tc(MIN.) =   19.61
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.878
  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        0.66      0.75     0.500    56
  COMMERCIAL                 B        1.28      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.16      0.75     0.600    56
  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) =    4.99
  EFFECTIVE AREA(ACRES) =    383.28    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) =     514.25
  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) = 1.19   HALFSTREET FLOOD WIDTH(FEET) =  52.31
  FLOW VELOCITY(FEET/SEC.) =  9.27   DEPTH*VELOCITY(FT*FT/SEC.) =  11.00

  *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) =  63.00    NUMBER OF PIPES =   1
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  20.03
  PIPE-FLOW(CFS) =     433.89
  PIPEFLOW TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =  19.38
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.891
  SUBAREA AREA(ACRES) =    3.59      SUBAREA RUNOFF(CFS) =    5.04
  TOTAL AREA(ACRES) =      470.8        PEAK FLOW RATE(CFS) =     514.25
  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) =   80.36
    ***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.) =    5.98
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.85
  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
```



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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =     540.04
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  1.22
    HALFSTREET FLOOD WIDTH(FEET) =   53.96
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    9.16
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   11.17
  STREET FLOW TRAVEL TIME(MIN.) =   0.77   Tc(MIN.) =   20.15
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.848
  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        0.99      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
  "2 DWELLINGS/ACRE"         B       35.47      0.75     0.700    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) =   51.58
  EFFECTIVE AREA(ACRES) =    425.42    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) =     545.11

  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) = 1.22   HALFSTREET FLOOD WIDTH(FEET) =  54.21
  FLOW VELOCITY(FEET/SEC.) =  9.16   DEPTH*VELOCITY(FT*FT/SEC.) =  11.22

  *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) =  66.00    NUMBER OF PIPES =   1
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  20.04
  PIPE-FLOW(CFS) =     476.65
  PIPEFLOW TRAVEL TIME(MIN.) =   0.35    Tc(MIN.) =  19.73
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.871
  SUBAREA AREA(ACRES) =   42.14      SUBAREA RUNOFF(CFS) =   52.47
  TOTAL AREA(ACRES) =      513.0        PEAK FLOW RATE(CFS) =     554.04

  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) =   77.40
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.64
    HALFSTREET FLOOD WIDTH(FEET) =   25.15
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.78
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.72

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      540.39   13.93    2.306  0.74( 0.43) 0.58     319.8   20649.00
      2      554.04   19.73    1.871  0.74( 0.42) 0.57     425.4   20640.00
      3      504.41   26.61    1.564  0.74( 0.43) 0.58     493.3   20600.00
      4      455.41   31.40    1.416  0.74( 0.43) 0.58     513.0   20620.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     554.04  Tc(MIN.) =   19.73
  AREA-AVERAGED Fm(INCH/HR) =  0.42  AREA-AVERAGED Fp(INCH/HR) =  0.74
  AREA-AVERAGED Ap =  0.57  EFFECTIVE AREA(ACRES) =     425.42
  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) =     566.32
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  1.58
    HALFSTREET FLOOD WIDTH(FEET) =   71.91
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.44
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    8.58
  STREET FLOW TRAVEL TIME(MIN.) =   2.00   Tc(MIN.) =   21.74
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.765
  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        1.69      0.75     0.500    56
  RESIDENTIAL
```



```
  "2 DWELLINGS/ACRE"         B       14.94      0.75     0.700    56
  COMMERCIAL                 B        1.47      0.75     0.100    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        1.34      0.61     1.000    66
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.78      0.75     0.600    56
  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) =   24.55
  EFFECTIVE AREA(ACRES) =    446.64    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) =     554.04
  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) = 1.57   HALFSTREET FLOOD WIDTH(FEET) =  71.30
  FLOW VELOCITY(FEET/SEC.) =  5.41   DEPTH*VELOCITY(FT*FT/SEC.) =   8.47

  *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) =  87.00    NUMBER OF PIPES =   1
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.25
  PIPE-FLOW(CFS) =     505.95
  PIPEFLOW TRAVEL TIME(MIN.) =   0.89    Tc(MIN.) =  20.62
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.822
  SUBAREA AREA(ACRES) =   21.22      SUBAREA RUNOFF(CFS) =   25.63
  TOTAL AREA(ACRES) =      534.2        PEAK FLOW RATE(CFS) =     560.96

  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) =   55.01
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.71
    HALFSTREET FLOOD WIDTH(FEET) =   28.63
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.21
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.29

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      549.44   14.82    2.222  0.74( 0.43) 0.58     341.0   20649.00
      2      560.96   20.62    1.822  0.74( 0.43) 0.58     446.6   20640.00
      3      512.66   27.39    1.537  0.74( 0.43) 0.58     514.5   20600.00
      4      463.09   32.20    1.395  0.74( 0.43) 0.58     534.2   20620.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     560.96  Tc(MIN.) =   20.62
  AREA-AVERAGED Fm(INCH/HR) =  0.43  AREA-AVERAGED Fp(INCH/HR) =  0.74
  AREA-AVERAGED Ap =  0.58  EFFECTIVE AREA(ACRES) =     446.64
  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:
  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
```

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 ************************************************************************
             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 20764                     *
* 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-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
```



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 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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.204
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.627
  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        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
  TOTAL AREA(ACRES) =      9.99   PEAK FLOW RATE(CFS) =     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
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  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      Fp         Ap     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
  "OPEN BRUSH"               B        2.38      0.61     1.000    66
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        0.08      0.75     0.400    56
  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) =     24.82
  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
  TOTAL AREA(ACRES) =       16.6         PEAK FLOW RATE(CFS) =      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      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.10      0.75     0.600    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        3.64      0.61     1.000    66
  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
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  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
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.379
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        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<<<<<
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==============================================================================
  UPSTREAM NODE ELEVATION(FEET) =   2070.00
  DOWNSTREAM NODE ELEVATION(FEET) =   2065.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   236.79
  "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) =  2.305
  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        4.91      0.75     0.400    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.39      0.75     0.600    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.79      0.61     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.72
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.518
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     49.16
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.48
  AVERAGE FLOW DEPTH(FEET) =   0.70   FLOOD WIDTH(FEET) =   44.30
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.72   Tc(MIN.) =   13.94
  SUBAREA AREA(ACRES) =    8.09       SUBAREA RUNOFF(CFS) =   14.06
  EFFECTIVE AREA(ACRES) =   33.33     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.68  AREA-AVERAGED Ap =   0.72
  TOTAL AREA(ACRES) =       33.3         PEAK FLOW RATE(CFS) =      54.49

  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) =  0.72   FLOOD WIDTH(FEET) =   46.39
  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.

****************************************************************************
  FLOW PROCESS FROM NODE  20705.00 TO NODE  20706.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2065.00  DOWNSTREAM ELEVATION(FEET) = 2060.00
  STREET LENGTH(FEET) =   308.42   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) =      57.86
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    ***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.) =    4.66
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.90
  STREET FLOW TRAVEL TIME(MIN.) =   1.10   Tc(MIN.) =   15.04
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.202
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        3.14      0.61     1.000    66
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.43      0.75     0.600    56
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        0.92      0.75     0.400    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.64
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.839
  SUBAREA AREA(ACRES) =    4.49       SUBAREA RUNOFF(CFS) =    6.74
  EFFECTIVE AREA(ACRES) =     37.82    AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap =  0.73
  TOTAL AREA(ACRES) =       37.8         PEAK FLOW RATE(CFS) =      58.14

  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) = 0.62   HALFSTREET FLOOD WIDTH(FEET) =  24.24
  FLOW VELOCITY(FEET/SEC.) =  4.66   DEPTH*VELOCITY(FT*FT/SEC.) =   2.91
  LONGEST FLOWPATH FROM NODE  20700.00 TO NODE  20706.00 =    2351.93 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20706.00 TO NODE  20707.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2060.00  DOWNSTREAM ELEVATION(FEET) = 2055.00
  STREET LENGTH(FEET) =   216.66   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) =   0.87

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      58.79
    ***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.) =    5.29
```

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  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.15
 STREET FLOW TRAVEL TIME(MIN.) =   0.68   Tc(MIN.) =   15.73
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.144
 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        0.78      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) =    0.78      SUBAREA RUNOFF(CFS) =    1.29
 EFFECTIVE AREA(ACRES) =     38.60    AREA-AVERAGED Fm(INCH/HR) =  0.49
 AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap =  0.73
 TOTAL AREA(ACRES) =       38.6        PEAK FLOW RATE(CFS) =      58.14
 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

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.59   HALFSTREET FLOOD WIDTH(FEET) =  22.65
 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.

****************************************************************************
 FLOW PROCESS FROM NODE  20707.00 TO NODE  20708.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 2055.00  DOWNSTREAM ELEVATION(FEET) = 2040.00
 STREET LENGTH(FEET) =   337.91   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) =      63.26
   ***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.) =    6.76
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.76
 STREET FLOW TRAVEL TIME(MIN.) =   0.83   Tc(MIN.) =   16.56
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.078
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL FAIR COVER
 "OPEN BRUSH"               B        4.36      0.61     1.000    66
```



```
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        1.39      0.75     0.700    56
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"      B        1.58      0.75     0.400    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.65
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.814
 SUBAREA AREA(ACRES) =    7.33      SUBAREA RUNOFF(CFS) =   10.22
 EFFECTIVE AREA(ACRES) =     45.93    AREA-AVERAGED Fm(INCH/HR) =  0.50
 AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap =  0.74
 TOTAL AREA(ACRES) =       45.9        PEAK FLOW RATE(CFS) =      65.42

 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) = 0.56   HALFSTREET FLOOD WIDTH(FEET) =  21.00
 FLOW VELOCITY(FEET/SEC.) =  6.85   DEPTH*VELOCITY(FT*FT/SEC.) =   3.83
 LONGEST FLOWPATH FROM NODE  20700.00 TO NODE  20708.00 =    2906.50 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  20708.00 TO NODE  20709.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION # 14 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 2040.00  DOWNSTREAM ELEVATION(FEET) = 2035.00
 STREET LENGTH(FEET) =   377.00   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 =  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) =      68.63
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.89
   HALFSTREET FLOOD WIDTH(FEET) =   47.97
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.60
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.10
 STREET FLOW TRAVEL TIME(MIN.) =   1.37   Tc(MIN.) =   17.93
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.982
 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        0.45      0.75     0.700    56
 NATURAL FAIR COVER
 "OPEN BRUSH"               B        1.33      0.61     1.000    66
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"      B        1.75      0.75     0.400    56
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"       B        1.06      0.75     0.500    56
```

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  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.69
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.626
  SUBAREA AREA(ACRES) =    4.59      SUBAREA RUNOFF(CFS) =    6.41
  EFFECTIVE AREA(ACRES) =     50.52    AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap =  0.73
  TOTAL AREA(ACRES) =       50.5        PEAK FLOW RATE(CFS) =      67.84

  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 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
  LONGEST FLOWPATH FROM NODE  20700.00 TO NODE  20709.00 =    3283.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20709.00 TO NODE  20710.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 14 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2035.00  DOWNSTREAM ELEVATION(FEET) = 2030.00
  STREET LENGTH(FEET) =   326.96   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) =   1.06

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      70.47
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.88
    HALFSTREET FLOOD WIDTH(FEET) =   46.72
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.92
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.32
  STREET FLOW TRAVEL TIME(MIN.) =   1.11   Tc(MIN.) =   19.03
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.912
  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        0.82      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.94      0.61     1.000    66
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        1.18      0.75     0.400    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        1.02      0.75     0.500    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.70
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.630
  SUBAREA AREA(ACRES) =    3.96      SUBAREA RUNOFF(CFS) =    5.25
  EFFECTIVE AREA(ACRES) =     54.48    AREA-AVERAGED Fm(INCH/HR) =  0.49
```



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  AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap =  0.72
  TOTAL AREA(ACRES) =       54.5        PEAK FLOW RATE(CFS) =      69.91

  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) = 0.88   HALFSTREET FLOOD WIDTH(FEET) =  46.56
  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.

****************************************************************************
  FLOW PROCESS FROM NODE  20710.00 TO NODE  20711.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 14 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2030.00  DOWNSTREAM ELEVATION(FEET) = 2025.00
  STREET LENGTH(FEET) =   298.59   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) =   1.04

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      73.36
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.88
    HALFSTREET FLOOD WIDTH(FEET) =   46.56
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.14
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.52
  STREET FLOW TRAVEL TIME(MIN.) =   0.97   Tc(MIN.) =   20.00
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.856
  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        4.34      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.10      0.61     1.000    66
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        0.27      0.75     0.400    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.92      0.75     0.500    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.658
  SUBAREA AREA(ACRES) =    5.63      SUBAREA RUNOFF(CFS) =    6.92
  EFFECTIVE AREA(ACRES) =     60.11    AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.68  AREA-AVERAGED Ap =  0.72
  TOTAL AREA(ACRES) =       60.1        PEAK FLOW RATE(CFS) =      74.08

  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) = 0.88   HALFSTREET FLOOD WIDTH(FEET) =  46.87
  FLOW VELOCITY(FEET/SEC.) =  5.14   DEPTH*VELOCITY(FT*FT/SEC.) =   4.53
  LONGEST FLOWPATH FROM NODE  20700.00 TO NODE  20711.00 =    3909.05 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20711.00 TO NODE  20712.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2025.00  DOWNSTREAM(FEET) =   2020.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   279.66   CHANNEL SLOPE =  0.0179
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      74.08
  FLOW VELOCITY(FEET/SEC.) =   5.88   FLOW DEPTH(FEET) =   1.55
  TRAVEL TIME(MIN.) =   0.79   Tc(MIN.) =   20.79
  LONGEST FLOWPATH FROM NODE  20700.00 TO NODE  20712.00 =    4188.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20712.00 TO NODE  20712.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   20.79
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.813
  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        2.62      0.75     0.700    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.72      0.75     0.500    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.657
  SUBAREA AREA(ACRES) =    3.34      SUBAREA RUNOFF(CFS) =    3.97
  EFFECTIVE AREA(ACRES) =     63.45   AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.68  AREA-AVERAGED Ap =  0.71
  TOTAL AREA(ACRES) =       63.5       PEAK FLOW RATE(CFS) =      75.74

  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  20712.00 TO NODE  20713.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2020.00  DOWNSTREAM(FEET) =   2000.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   371.84   CHANNEL SLOPE =  0.0538
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.500
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   2.50
  CHANNEL FLOW THRU SUBAREA(CFS) =      75.74
  FLOW VELOCITY(FEET/SEC.) =   8.53   FLOW DEPTH(FEET) =   1.13
```



```
  TRAVEL TIME(MIN.) =   0.73   Tc(MIN.) =   21.52
  LONGEST FLOWPATH FROM NODE  20700.00 TO NODE  20713.00 =    4560.55 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20713.00 TO NODE  20713.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   21.52
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.776
  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        2.10      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        3.26      0.61     1.000    66
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        1.09      0.75     0.500    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.67
  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
  AREA-AVERAGED Fp(INCH/HR) =  0.68  AREA-AVERAGED Ap =  0.72
  TOTAL AREA(ACRES) =       69.9       PEAK FLOW RATE(CFS) =      80.78

  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  20713.00 TO NODE  20714.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2000.00  DOWNSTREAM(FEET) =   1960.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   732.38   CHANNEL SLOPE =  0.0546
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   2.50
  CHANNEL FLOW THRU SUBAREA(CFS) =      80.78
  FLOW VELOCITY(FEET/SEC.) =   8.99   FLOW DEPTH(FEET) =   1.21
  TRAVEL TIME(MIN.) =   1.36   Tc(MIN.) =   22.88
  LONGEST FLOWPATH FROM NODE  20700.00 TO NODE  20714.00 =    5292.93 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20724.00 TO NODE  20724.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   22.88
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.712
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.63      0.61     1.000    66
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        1.94      0.75     0.500    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
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.050
  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
  "3-4 DWELLINGS/ACRE"       B        0.21      0.75     0.600    56    8.74
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        1.38      0.61     1.000    66   14.97
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        5.85      0.75     0.700    56    9.29
  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
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.273
  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
  "3-4 DWELLINGS/ACRE"       B        0.21      0.75     0.600    56    7.77
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.34      0.61     1.000    66   13.31
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        4.69      0.75     0.700    56    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       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     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
      2       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.
```

```
 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     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
     2       33.11    8.74    3.050  0.70( 0.54) 0.77      14.7   20718.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      34.02    Tc(MIN.) =     7.77
 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 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) =      44.86

 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
```



```
 RAINFALL INTENSITY(INCH/HR) =   3.12
 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      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        1.32      0.75     0.700    56
 NATURAL FAIR COVER
 "OPEN BRUSH"               B        4.12      0.61     1.000    66
 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
```

```
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.29   Tc(MIN.) =   11.97
  SUBAREA AREA(ACRES) =    5.44       SUBAREA RUNOFF(CFS) =    9.47
  EFFECTIVE AREA(ACRES) =   11.09     AREA-AVERAGED Fm(INCH/HR) =   0.56
  AREA-AVERAGED Fp(INCH/HR) =   0.69  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =       11.1          PEAK FLOW RATE(CFS) =      19.64

  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) =   23.24
  FLOW VELOCITY(FEET/SEC.) =   6.70   DEPTH*VELOCITY(FT*FT/SEC) =   3.50
  LONGEST FLOWPATH FROM NODE  20720.00 TO NODE  20722.00 =    1162.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20722.00 TO NODE  20722.00 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.) =   11.97
  RAINFALL INTENSITY(INCH/HR) =   2.53
  AREA-AVERAGED Fm(INCH/HR) =  0.56
  AREA-AVERAGED Fp(INCH/HR) =  0.69
  AREA-AVERAGED Ap =  0.81
  EFFECTIVE STREAM AREA(ACRES) =      11.09
  TOTAL STREAM AREA(ACRES) =      11.09
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      19.64

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       44.86    8.43    3.117  0.72( 0.54) 0.75      19.3   20718.50
      1       43.19    9.40    2.919  0.72( 0.54) 0.75      20.2   20718.00
      2       19.64   11.97    2.525  0.69( 0.56) 0.81      11.1   20720.00

  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       62.85    8.43    3.117  0.71( 0.54) 0.77      27.1   20718.50
      2       61.71    9.40    2.919  0.71( 0.54) 0.77      28.9   20718.00
      3       55.69   11.97    2.525  0.70( 0.55) 0.77      31.2   20720.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      62.85    Tc(MIN.) =     8.43
  EFFECTIVE AREA(ACRES) =      27.14   AREA-AVERAGED Fm(INCH/HR) =  0.54
  AREA-AVERAGED Fp(INCH/HR) =  0.71  AREA-AVERAGED Ap =  0.77
  TOTAL AREA(ACRES) =       31.2
  LONGEST FLOWPATH FROM NODE  20720.00 TO NODE  20722.00 =    1162.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20722.00 TO NODE  20723.00 IS CODE =  92
----------------------------------------------------------------------------
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  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =   2015.00
  DOWNSTREAM NODE ELEVATION(FEET) =   2000.00
  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
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.01700
  MAXIMUM DEPTH(FEET) =   1.00
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.772
  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        5.92      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        5.87      0.61     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.67
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.849
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     74.51
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.10
  AVERAGE FLOW DEPTH(FEET) =   0.77   FLOOD WIDTH(FEET) =   52.21
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.82   Tc(MIN.) =   10.25
  SUBAREA AREA(ACRES) =   11.79       SUBAREA RUNOFF(CFS) =   23.38
  EFFECTIVE AREA(ACRES) =   38.93     AREA-AVERAGED Fm(INCH/HR) =   0.55
  AREA-AVERAGED Fp(INCH/HR) =   0.69  AREA-AVERAGED Ap =   0.79
  TOTAL AREA(ACRES) =       43.0          PEAK FLOW RATE(CFS) =      77.81

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.64; 6HR = 2.29; 24HR = 5.01

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.78   FLOOD WIDTH(FEET) =   53.26
  FLOW VELOCITY(FEET/SEC.) =   6.13   DEPTH*VELOCITY(FT*FT/SEC) =   4.76
  LONGEST FLOWPATH FROM NODE  20720.00 TO NODE  20723.00 =    1827.20 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20723.00 TO NODE  20724.00 IS CODE =  92
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =   2000.00
  DOWNSTREAM NODE ELEVATION(FEET) =   1960.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =     2.00
  "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
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.772
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        9.77      0.61     1.000    66
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.38      0.75     0.500    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.62
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.981
```

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  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     87.70
  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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       97.60   10.25    2.772  0.68( 0.56) 0.83      49.1   20718.50
      2       94.24   11.24    2.623  0.68( 0.56) 0.83      50.8   20718.00
      3       83.88   13.85    2.314  0.68( 0.56) 0.83      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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   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
      2      164.35   11.24    2.623  0.68( 0.53) 0.79      87.4   20718.00
      3      157.74   13.85    2.314  0.68( 0.53) 0.78      98.3   20720.00
      4      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:
   STREAM       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
      2      560.96   20.62  0.74( 0.43) 0.58      446.6   20640.00
      3      512.66   27.39  0.74( 0.43) 0.58      514.5   20600.00
      4      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       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
      2      560.96   20.62  0.74( 0.43) 0.58      446.6   20640.00
      3      512.66   27.39  0.74( 0.43) 0.58      514.5   20600.00
      4      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 =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 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) =     571.98
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  1.11
   HALFSTREET FLOOD WIDTH(FEET) =   48.71
   AVERAGE FLOW VELOCITY(FEET/SEC.) =   11.87
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   13.22
 STREET FLOW TRAVEL TIME(MIN.) =   1.32   Tc(MIN.) =   21.95
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.755
 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        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    56
 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) =   22.04
 EFFECTIVE AREA(ACRES) =    467.10    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) =     560.96
 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

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 1.11   HALFSTREET FLOOD WIDTH(FEET) =  48.35
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 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.) =  25.80
 PIPE-FLOW(CFS) =     507.11
 PIPEFLOW 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) =     570.98

 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 Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =   63.87
   ***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.) =    6.79
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.78

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     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
     3      520.99   28.00    1.517  0.73( 0.43) 0.59     535.0   20600.00
     4      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 **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     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
     3      520.99   28.00    1.517  0.73( 0.43) 0.59     535.0   20600.00
     4      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.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     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
     3      157.74   13.92    2.306  0.68( 0.53) 0.78      98.3   20720.00
     4      136.75   22.96    1.709  0.68( 0.52) 0.77     127.7   20700.00
  LONGEST FLOWPATH FROM NODE  20700.00 TO NODE  20725.00 =    5374.33 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      671.34   10.32    2.760  0.72( 0.46) 0.65     324.4   20718.50
     2      682.90   11.31    2.612  0.72( 0.46) 0.64     352.4   20718.00
     3      706.11   13.92    2.306  0.72( 0.46) 0.64     424.5   20720.00
     4      717.07   15.43    2.169  0.72( 0.46) 0.64     464.6   20649.00
     5      711.74   21.23    1.790  0.72( 0.45) 0.63     589.1   20640.00
     6      694.99   22.96    1.709  0.72( 0.45) 0.63     612.0   20700.00
     7      635.62   28.00    1.517  0.72( 0.45) 0.63     662.6   20600.00
     8      570.63   32.73    1.381  0.72( 0.45) 0.63     682.3   20620.00
    TOTAL AREA(ACRES) =       682.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      717.07  Tc(MIN.) =   15.426
  EFFECTIVE AREA(ACRES) =    464.64  AREA-AVERAGED Fm(INCH/HR) =  0.46
  AREA-AVERAGED Fp(INCH/HR) =  0.72  AREA-AVERAGED Ap =  0.65
  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= 0.36;30M= 0.73;1H= 0.96;3H= 1.64;6H= 2.29;24H= 4.92
  S-GRAPH: VALLEY(DEV.)= 77.8%;VALLEY(UNDEV.)/DESERT= 22.2%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.55; LAG(HR) = 0.44; Fm(INCH/HR) = 0.45; Ybar = 0.50
  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
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =      682.3
  LONGEST FLOWPATH FROM NODE  20620.00 TO NODE  20725.00 =    8623.85 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0507; Lca/L=0.4,n=.0455; Lca/L=0.5,n=.0418;Lca/L=0.6,n=.0390
  TIME OF PEAK FLOW(HR) = 16.50  RUNOFF VOLUME(AF) =     148.19
  UNIT-HYDROGRAPH METHOD PEAK FLOW RATE(CFS) =    633.76
  TOTAL PEAK FLOW RATE(CFS) =    633.76 (SOURCE FLOW INCLUDED)
  RATIONAL METHOD PEAK FLOW RATE(CFS) =    717.07
   (UPSTREAM NODE PEAK FLOW RATE(CFS) =    717.07)
  PEAK FLOW RATE(CFS) USED =    717.07

****************************************************************************
  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
```



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----------------------------------------------------------------------------
  >>>>>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) =     717.07
  FLOW VELOCITY(FEET/SEC.) =  31.18   FLOW DEPTH(FEET) =   2.21
  TRAVEL TIME(MIN.) =   0.76   Tc(MIN.) =   33.49
  LONGEST 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.) =   33.49
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.362
  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        3.96      0.75     0.500    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        4.31      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       14.46      0.61     1.000    66
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.98      0.75     0.600    56
  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= 0.36;30M= 0.73;1H= 0.96;3H= 1.64;6H= 2.29;24H= 4.92
  S-GRAPH: VALLEY(DEV.)= 76.5%;VALLEY(UNDEV.)/DESERT= 23.5%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.56; LAG(HR) = 0.45; Fm(INCH/HR) = 0.46; Ybar = 0.50
  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
  UNIT-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=.0477; Lca/L=0.4,n=.0428; Lca/L=0.5,n=.0393;Lca/L=0.6,n=.0367
  TIME OF PEAK FLOW(HR) = 16.50  RUNOFF VOLUME(AF) =     152.55
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =     644.44
  TOTAL AREA(ACRES) =      706.0       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  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) =     717.07
  FLOW VELOCITY(FEET/SEC.) =  28.84   FLOW DEPTH(FEET) =   2.33
  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  20727.00 TO NODE  20727.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   33.93
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.351
  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        1.92      0.75     0.500    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        6.30      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       12.35      0.61     1.000    66
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.34      0.75     0.600    56
  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= 0.36;30M= 0.73;1H= 0.96;3H= 1.64;6H= 2.29;24H= 4.92
  S-GRAPH: VALLEY(DEV.)= 75.4%;VALLEY(UNDEV.)/DESERT= 24.6%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  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.
  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=.0460; Lca/L=0.4,n=.0413; Lca/L=0.5,n=.0379;Lca/L=0.6,n=.0354
  TIME OF PEAK FLOW(HR) = 16.50  RUNOFF VOLUME(AF) =     156.30
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =     655.18
  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

****************************************************************************
  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) =     717.07
  FLOW VELOCITY(FEET/SEC.) =  19.70   FLOW DEPTH(FEET) =   2.71
  TRAVEL TIME(MIN.) =   0.70   Tc(MIN.) =   34.64
  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.) =   34.64
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.335
  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        3.88      0.75     0.500    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       12.91      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        6.79      0.75     0.600    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        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= 0.36;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) =      752.9
  LONGEST FLOWPATH FROM NODE  20620.00 TO NODE  20728.00 =   11638.30 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0441; Lca/L=0.4,n=.0396; Lca/L=0.5,n=.0364;Lca/L=0.6,n=.0339
  TIME OF PEAK FLOW(HR) = 16.50  RUNOFF VOLUME(AF) =     161.67
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =     668.67
  TOTAL AREA(ACRES) =      752.9       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

****************************************************************************
  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
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  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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.
   EQUIVALENT 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) =      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
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.191
  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        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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        5.96      0.61     1.000    66
  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
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        0.59      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        7.70      0.61     1.000    66
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        5.46      0.75     0.500    56
  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
  TOTAL AREA(ACRES) =       29.7       PEAK FLOW RATE(CFS) =      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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       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"       B        4.95      0.75     0.500    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       17.32      0.61     1.000    66
  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) =  115.55
  EFFECTIVE 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) =     169.46

  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) =   2.51
  AREA-AVERAGED Fm(INCH/HR) =  0.52
  AREA-AVERAGED Fp(INCH/HR) =  0.69
  AREA-AVERAGED Ap =  0.76
  EFFECTIVE 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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.865
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.539
  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        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) =     14.02

 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      Fp         Ap      SCS
      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
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.192
 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        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) =   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      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 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) =    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<<<<<
  >>>>>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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        6.61      0.75     0.700    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 =  0.697
  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      Fp         Ap     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"         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) =   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      Fp         Ap     SCS
       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"         B        9.61      0.75     0.700    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.694
```

```
  SUBAREA AREA(ACRES) =   10.18      SUBAREA RUNOFF(CFS) =   11.55
  EFFECTIVE AREA(ACRES) =     53.02   AREA-AVERAGED Fm(INCH/HR) =  0.52
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.70
  TOTAL AREA(ACRES) =       53.0       PEAK FLOW RATE(CFS) =      60.04

  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  20747.00 TO NODE  20748.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1840.00  DOWNSTREAM(FEET) =   1815.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   752.37   CHANNEL SLOPE =  0.0332
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  15.000
  MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      60.04
  FLOW VELOCITY(FEET/SEC.) =   3.85   FLOW DEPTH(FEET) =   1.02
  TRAVEL TIME(MIN.) =   3.26   Tc(MIN.) =   24.70
  LONGEST FLOWPATH FROM NODE  20740.00 TO NODE  20748.00 =    4550.01 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20748.00 TO NODE  20748.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   24.70
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.635
  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        8.54      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.23      0.75     0.600    56
  PUBLIC PARK                B        0.78      0.75     0.850    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        1.16      0.75     0.500    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.673
  SUBAREA AREA(ACRES) =   12.71      SUBAREA RUNOFF(CFS) =   12.94
  EFFECTIVE AREA(ACRES) =     65.73   AREA-AVERAGED Fm(INCH/HR) =  0.52
  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):
  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<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
```



```
  TIME OF CONCENTRATION(MIN.) =   24.70
  RAINFALL INTENSITY(INCH/HR) =   1.64
  AREA-AVERAGED Fm(INCH/HR) =  0.52
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.69
  EFFECTIVE STREAM AREA(ACRES) =      65.73
  TOTAL STREAM AREA(ACRES) =      65.73
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      66.08
  ** CONFLUENCE DATA **
  STREAM      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1       717.07   34.85      753.64    20620.00
     2       169.46   12.05       94.59    20730.00
     3        66.08   24.70       65.73    20740.00

  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= 4.94
  S-GRAPH: VALLEY(DEV.)= 76.6%;VALLEY(UNDEV.)/DESERT= 23.4%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.58; LAG(HR) = 0.46; Fm(INCH/HR) = 0.47; Ybar = 0.52
  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
  LONGEST FLOWPATH FROM NODE  20620.00 TO NODE  20748.00 =   11898.10 FEET.
   EQUIVALENT 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) =     192.98
  PEAK FLOW RATE(CFS) =     794.85

****************************************************************************
  FLOW PROCESS FROM NODE  20748.00 TO NODE  20749.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1815.00  DOWNSTREAM(FEET) =   1700.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2764.03   CHANNEL SLOPE =  0.0416
  CHANNEL BASE(FEET) =    8.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   4.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     794.85
  FLOW VELOCITY(FEET/SEC.) =  27.44   FLOW DEPTH(FEET) =   2.30
  TRAVEL TIME(MIN.) =   1.68   Tc(MIN.) =   36.53
  LONGEST FLOWPATH FROM NODE  20620.00 TO NODE  20749.00 =   14662.13 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20749.00 TO NODE  20749.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   36.53
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.293
  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       46.16      0.75     0.700    56
```

```
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        9.13      0.75     0.600    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B       13.04      0.75     0.500    56
  PUBLIC PARK                B       14.63      0.75     0.850    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.684
  SUBAREA AREA(ACRES) =   82.96
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.36;30M= 0.73;1H= 0.96;3H= 1.64;6H= 2.29;24H= 4.95
  S-GRAPH: VALLEY(DEV.)= 78.6%;VALLEY(UNDEV.)/DESERT= 21.4%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.61; LAG(HR) = 0.49; Fm(INCH/HR) = 0.47; Ybar = 0.52
  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) =      996.9
  LONGEST FLOWPATH FROM NODE  20620.00 TO NODE  20749.00 =   14662.13 FEET.
   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
  TIME OF PEAK FLOW(HR) = 16.50  RUNOFF VOLUME(AF) =     209.35
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =     822.90
  TOTAL AREA(ACRES) =      996.9       PEAK FLOW RATE(CFS) =     822.90

  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) =     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.

****************************************************************************
  FLOW PROCESS FROM NODE  20763.00 TO NODE  20763.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   38.63
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.250
  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       17.57      0.75     0.500    56
  COMMERCIAL                 B        0.79      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       11.86      0.75     0.600    56
  RESIDENTIAL
```



```
  "2 DWELLINGS/ACRE"         B       51.53      0.75     0.700    56
  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= 0.36;30M= 0.73;1H= 0.96;3H= 1.64;6H= 2.29;24H= 4.95
  S-GRAPH: VALLEY(DEV.)= 80.2%;VALLEY(UNDEV.)/DESERT= 19.8%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.64; LAG(HR) = 0.52; Fm(INCH/HR) = 0.47; Ybar = 0.52
  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=.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) =     226.58
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =     864.61
  TOTAL AREA(ACRES) =     1078.7       PEAK FLOW RATE(CFS) =     864.61

  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) =     864.61    Tc(MIN.) =   38.63
  AREA-AVERAGED Fm(INCH/HR) =  0.47   Ybar = 0.52
  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
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.467
  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        5.98      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) =     15.18
```

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  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)<<<<<
============================================================================
  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) =      15.18
  FLOW VELOCITY(FEET/SEC.) =   0.89   FLOW DEPTH(FEET) =   0.04
  TRAVEL TIME(MIN.) =   9.03   Tc(MIN.) =   21.47
  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.) =   21.47
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.779
  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        0.44      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        4.07      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) =    4.51      SUBAREA RUNOFF(CFS) =    5.12
  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) =      15.18
  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  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

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
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  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      28.96
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.44
    HALFSTREET FLOOD WIDTH(FEET) =   15.93
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.45
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.43
  STREET FLOW TRAVEL TIME(MIN.) =   1.25   Tc(MIN.) =   22.72
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.719
  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        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) =   27.55
  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) =      41.84

  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 STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.49   HALFSTREET FLOOD WIDTH(FEET) =  18.00
  FLOW VELOCITY(FEET/SEC.) =  6.01   DEPTH*VELOCITY(FT*FT/SEC.) =   2.96
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  408.2 FT WITH ELEVATION-DROP =  20.0 FT, IS   59.9 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
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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
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  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      47.97
  ***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.) =    6.94
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.41
STREET FLOW TRAVEL TIME(MIN.) =   1.45   Tc(MIN.) =   24.16
*  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.657
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        9.79      0.75     0.700    56
RESIDENTIAL
"3-4 DWELLINGS/ACRE"       B        1.89      0.75     0.600    56
SCHOOL                     B        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) =   12.27
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) =      51.94

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) = 0.50   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  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) =      71.67
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.61
   HALFSTREET FLOOD WIDTH(FEET) =   23.57
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.05
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   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.70
 STREET FLOW TRAVEL TIME(MIN.) =   1.94   Tc(MIN.) =   26.10
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.582
 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       31.15      0.75     0.700    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        6.15      0.75     0.600    56
 SCHOOL                     B        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) =   39.46
 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) =      88.00

 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) = 0.65   HALFSTREET FLOOD WIDTH(FEET) =  25.52
 FLOW VELOCITY(FEET/SEC.) =  6.40   DEPTH*VELOCITY(FT*FT/SEC.) =   4.16
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        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
 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) =      93.35
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.61
   HALFSTREET FLOOD WIDTH(FEET) =   23.32
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    8.04
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.88
 STREET FLOW TRAVEL TIME(MIN.) =   1.63   Tc(MIN.) =   27.73
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.525
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  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        9.12      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.57      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.678
  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) =      94.08

  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.

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  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
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.20
  STREET FLOW TRAVEL TIME(MIN.) =   1.62   Tc(MIN.) =   29.36
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.474
  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        8.65      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.04      0.75     0.600    56
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  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) =      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) = 0.60   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) =  0.71
    HALFSTREET FLOOD WIDTH(FEET) =   28.51
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.30
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.18
  STREET FLOW TRAVEL TIME(MIN.) =   2.16   Tc(MIN.) =   31.52
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.413
  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       50.96      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       11.45      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) =   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
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  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
       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) =   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:
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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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
  PUBLIC PARK                B        1.84      0.75     0.850    56
  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
```

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  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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) =   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
  TOTAL AREA(ACRES) =      324.2       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      Fp         Ap     SCS
       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"         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) =   27.64
```



```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B       19.08      0.75     0.500    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B      133.50      0.75     0.700    56
```

```
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       16.16      0.75     0.600    56
  COMMERCIAL                 B       11.70      0.75     0.100    56
  MOBILE HOME PARK           B        5.20      0.75     0.250    56
  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
  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 **
  STREAM      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1       864.61   38.63     1078.67    20620.00
     2       372.44   38.83      550.66    20750.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.36;30M= 0.73;1H= 0.96;3H= 1.65;6H= 2.30;24H= 4.98
  S-GRAPH: VALLEY(DEV.)= 86.9%;VALLEY(UNDEV.)/DESERT= 13.1%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.64; LAG(HR) = 0.52; Fm(INCH/HR) = 0.48; Ybar = 0.53
  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=.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
  PEAK FLOW RATE(CFS) =    1285.32

****************************************************************************
  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) =    1285.32
  FLOW VELOCITY(FEET/SEC.) =  26.55   FLOW DEPTH(FEET) =   3.02
  TRAVEL TIME(MIN.) =   2.07   Tc(MIN.) =   40.70
  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.) =   40.70
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.212
  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       27.93      0.75     0.600    56
  MOBILE HOME PARK           B        2.86      0.75     0.250    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       36.04      0.75     0.700    56
  PUBLIC PARK                B        0.07      0.75     0.850    56
  COMMERCIAL                 B        0.16      0.75     0.100    56
  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= 0.36;30M= 0.73;1H= 0.96;3H= 1.65;6H= 2.30;24H= 4.98
  S-GRAPH: VALLEY(DEV.)= 87.4%;VALLEY(UNDEV.)/DESERT= 12.6%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.68; LAG(HR) = 0.54; Fm(INCH/HR) = 0.48; 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) =     1696.4
  LONGEST FLOWPATH FROM NODE  20620.00 TO NODE  20764.00 =   21121.48 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0331; 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) =     353.32
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    1299.02
  TOTAL AREA(ACRES) =     1696.4       PEAK FLOW RATE(CFS) =    1299.02

  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.) =     40.70
  AREA-AVERAGED Fm(INCH/HR)=  0.48   Ybar =  0.53
```

PEAK FLOW RATE(CFS) = 1299.02

==========

==========

END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS

```
 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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             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 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:
========================================================================
                    --*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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.095
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.797
  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        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) =     17.78
  TOTAL 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
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =      23.50
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.46
   HALFSTREET FLOOD WIDTH(FEET) =   16.55
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.11
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.88
 STREET FLOW TRAVEL TIME(MIN.) =   1.51   Tc(MIN.) =   11.60
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.573
 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        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) =   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) =      27.46

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69

 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.

****************************************************************************
 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
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 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) =      32.93
   ***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.) =    4.73
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.33
 STREET FLOW TRAVEL TIME(MIN.) =   0.80   Tc(MIN.) =   12.40
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.473
 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        0.63      0.75     0.600    56
 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) =   10.94
 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) =      37.06

 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.

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 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) =      40.13
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.50
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    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         Ap     SCS
       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    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      Fp         Ap     SCS
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       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) =   22.20
  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) =      61.16

  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) = 0.62   HALFSTREET FLOOD WIDTH(FEET) =  24.05
  FLOW VELOCITY(FEET/SEC.) =  4.97   DEPTH*VELOCITY(FT*FT/SEC.) =   3.09
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  266.3 FT WITH ELEVATION-DROP =   5.0 FT, IS   32.8 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) =      68.65
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.66
    HALFSTREET FLOOD WIDTH(FEET) =   25.95
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.84
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.19
  STREET FLOW TRAVEL TIME(MIN.) =   1.09   Tc(MIN.) =   15.44
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.168
  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        7.96      0.75     0.700    56
  RESIDENTIAL
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  "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 AREA FRACTION, Ap =  0.679
  SUBAREA AREA(ACRES) =   10.03      SUBAREA RUNOFF(CFS) =   14.98
  EFFECTIVE AREA(ACRES) =     48.78    AREA-AVERAGED Fm(INCH/HR) =  0.51
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.68
  TOTAL AREA(ACRES) =       48.8        PEAK FLOW RATE(CFS) =      72.76

  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) = 0.67   HALFSTREET FLOOD WIDTH(FEET) =  26.50
  FLOW VELOCITY(FEET/SEC.) =  4.93   DEPTH*VELOCITY(FT*FT/SEC.) =   3.30
  LONGEST FLOWPATH FROM NODE  20800.00 TO NODE  20805.00 =    2233.04 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20805.00 TO NODE  20806.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  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

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =     108.54
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.64
    HALFSTREET FLOOD WIDTH(FEET) =   24.91
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    8.26
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.27
  STREET FLOW TRAVEL TIME(MIN.) =   1.24   Tc(MIN.) =   16.68
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.069
  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       36.94      0.75     0.700    56
  SCHOOL                     B        3.99      0.75     0.600    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        9.63      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.22      0.75     0.900    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.674
  SUBAREA AREA(ACRES) =   50.78      SUBAREA RUNOFF(CFS) =   71.53
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  EFFECTIVE AREA(ACRES) =     99.56    AREA-AVERAGED Fm(INCH/HR) =  0.51
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.68
  TOTAL AREA(ACRES) =       99.6        PEAK FLOW RATE(CFS) =     139.97

  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) = 0.69   HALFSTREET FLOOD WIDTH(FEET) =  27.47
  FLOW VELOCITY(FEET/SEC.) =  8.84   DEPTH*VELOCITY(FT*FT/SEC.) =   6.10
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  616.6 FT WITH ELEVATION-DROP =  30.0 FT, IS  106.7 CFS,
         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 PROCESS FROM NODE  20806.00 TO NODE  20807.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2098.00  DOWNSTREAM ELEVATION(FEET) = 2090.00
  STREET LENGTH(FEET) =   573.68   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 =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =     143.24
    ***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.) =    5.55
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.71
  STREET FLOW TRAVEL TIME(MIN.) =   1.72   Tc(MIN.) =   18.40
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.951
  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        2.85      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.45      0.75     0.600    56
  SCHOOL                     B        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) =    6.54
  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) =     139.97
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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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:
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  DEPTH(FEET) = 0.74   HALFSTREET FLOOD WIDTH(FEET) =  29.79
  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) =     153.97
    ***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         Ap     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"       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 **
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  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      Fp         Ap     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"       B        2.65      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
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  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.683
  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
  PIPE-FLOW(CFS) =      64.54
  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
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  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         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B       30.03      0.75     0.700    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        5.60      0.75     0.600    56
 PUBLIC PARK                B        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)<<<<<
============================================================================
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 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      Fp         Ap     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
 PUBLIC PARK                B       18.85      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) =   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) =     214.37
 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):
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 DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
PUBLIC PARK                 B       80.80      0.75      0.850    56
RESIDENTIAL
"2 DWELLINGS/ACRE"          B      130.26      0.75      0.700    56
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
"OPEN BRUSH"                B        0.24      0.61      1.000    66
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) =  168.90
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) =     327.32

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  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  32.2 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =  29.45
PIPE-FLOW(CFS) =     327.32
*NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
PIPEFLOW TRAVEL TIME(MIN.) =   0.87    Tc(MIN.) =  35.26
LONGEST FLOWPATH FROM NODE  20800.00 TO NODE  20814.00 =   10295.47 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  20814.00 TO NODE  20814.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
MAINLINE Tc(MIN.) =   35.26
*  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.321
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       11.54      0.75      0.600    56
RESIDENTIAL
"2 DWELLINGS/ACRE"          B       58.78      0.75      0.700    56
PUBLIC PARK                 B        6.25      0.75      0.850    56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.697
SUBAREA AREA(ACRES) =   76.57      SUBAREA RUNOFF(CFS) =   55.08
EFFECTIVE AREA(ACRES) =    530.27   AREA-AVERAGED Fm(INCH/HR) =  0.54
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AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.72
TOTAL AREA(ACRES) =      530.3       PEAK FLOW RATE(CFS) =     374.22

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      SCS
     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
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                 B       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%
```

```
          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      Fp         Ap     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.
```



```
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        8.26      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.53      0.75     0.600    56
  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):
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  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69

****************************************************************************
  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) =     615.47    Tc(MIN.) =   38.35
  AREA-AVERAGED Fm(INCH/HR) =  0.53   Ybar = 0.59
  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
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.465
  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
  "3-4 DWELLINGS/ACRE"       B        2.07      0.75     0.600    56   12.46
  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
  SUBAREA RUNOFF(CFS) =     14.26
  TOTAL AREA(ACRES) =      8.08   PEAK FLOW RATE(CFS) =     14.26

  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  20821.00 TO NODE  20822.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1720.00  DOWNSTREAM ELEVATION(FEET) = 1700.00
  STREET LENGTH(FEET) =   668.72   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
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0180
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200
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  MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) =   0.81

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      24.87
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.46
    HALFSTREET FLOOD WIDTH(FEET) =   16.55
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.35
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.99
  STREET FLOW TRAVEL TIME(MIN.) =   2.56   Tc(MIN.) =   15.03
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.203
  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        4.10      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        9.73      0.75     0.700    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.670
  SUBAREA AREA(ACRES) =   13.83      SUBAREA RUNOFF(CFS) =   21.18
  EFFECTIVE AREA(ACRES) =     21.91    AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.67
  TOTAL AREA(ACRES) =       21.9        PEAK FLOW RATE(CFS) =      33.54

  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.) =  4.73   DEPTH*VELOCITY(FT*FT/SEC.) =   2.35
  LONGEST FLOWPATH FROM NODE  20820.00 TO NODE  20822.00 =    1393.04 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20822.00 TO NODE  20823.00 IS CODE =  33
----------------------------------------------------------------------------
  >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1700.00
  DOWNSTREAM NODE ELEVATION(FEET) =  1635.00
  FLOW LENGTH(FEET) =  1753.00   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  13.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.37
  PIPE-FLOW(CFS) =      33.54
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   2.02    Tc(MIN.) =  17.04
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.043
  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       28.07      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        8.56      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.677
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```
  SUBAREA AREA(ACRES) =   36.63      SUBAREA RUNOFF(CFS) =   50.66
  EFFECTIVE AREA(ACRES) =     58.54    AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.67
  TOTAL AREA(ACRES) =       58.5        PEAK FLOW RATE(CFS) =      81.04

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69

  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) =   47.50
    ***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.) =    5.78
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.04
  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.) =   17.04
  RAINFALL INTENSITY(INCH/HR) =   2.04
  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 =      81.04
  ** CONFLUENCE DATA **
  STREAM      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1       615.47   38.35      763.07    20800.00
     2        81.04   17.04       58.54    20820.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  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 = 0.96; 30M = 0.96; 1HR = 0.96;
```



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  3HR = 0.99; 6HR = 1.00; 24HR= 1.00
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =      821.6
  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) =     144.36
  PEAK FLOW RATE(CFS) =     661.66

****************************************************************************
  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) =   12.70
  ASSUME FULL-FLOWING BOX   BOX-FLOW VELOCITY(FEET/SEC.) =  17.36
  BOX-FLOW(CFS) =     661.66
  BOX-FLOW TRAVEL TIME(MIN.) =   1.42    Tc(MIN.) =   39.77
  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.) =   39.77
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.229
  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       96.44      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       25.64      0.75     0.600    56
  COMMERCIAL                 B        1.07      0.75     0.100    56
  PUBLIC PARK                B        0.22      0.75     0.850    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        3.67      0.63     1.000    65
  SCHOOL                     B        0.34      0.75     0.600    56
  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= 0.36;30M= 0.73;1H= 0.96;3H= 1.63;6H= 2.28;24H= 4.69
  S-GRAPH: VALLEY(DEV.)= 99.3%;VALLEY(UNDEV.)/DESERT=  0.7%
           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
  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.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0409; Lca/L=0.4,n=.0367; Lca/L=0.5,n=.0337;Lca/L=0.6,n=.0314
  TIME OF PEAK FLOW(HR) = 16.58  RUNOFF VOLUME(AF) =     167.53
```

```
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =     745.37
  TOTAL AREA(ACRES) =      949.0       PEAK FLOW RATE(CFS) =     745.37

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.28; 24HR = 4.69

****************************************************************************
  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      Fp         Ap     SCS
       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"         B       31.03      0.75     0.700    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        0.52      0.63     1.000    65
  PUBLIC PARK                B        6.54      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= 0.36;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.
   EQUIVALENT 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
```



```
  TOTAL AREA(ACRES) =      997.8       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      Fp         Ap     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"                 B        0.52      0.63     1.000    65
  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
```

```
****************************************************************************
  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      Fp         Ap     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.
   EQUIVALENT 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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       24.73      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) =   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
----------------------------------------------------------------------------
```

```
  >>>>>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.
   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) = 16.58  RUNOFF VOLUME(AF) =     190.18
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =     780.16
  TOTAL AREA(ACRES) =     1067.2       PEAK FLOW RATE(CFS) =     788.75
  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
```

```
****************************************************************************
  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) =     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
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.836
  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
  "3-4 DWELLINGS/ACRE"       B        6.12      0.75     0.600    56   13.37
  COMMERCIAL                 B        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) =     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

****************************************************************************
```



```
  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   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      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        7.31      0.75     0.600    56
  COMMERCIAL                 B        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) =   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)<<
============================================================================
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       23.09      0.75     0.600    56
  COMMERCIAL                 B        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) =   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) =     102.81

  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.67      0.75     0.600    56
  MOBILE HOME PARK           B        3.54      0.75     0.250    56
  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 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
  "5-7 DWELLINGS/ACRE"       B        3.00      0.75     0.500    56   10.11
  COMMERCIAL                 B        5.71      0.75     0.100    56    7.90
  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) =     26.75
```

```
  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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        3.16      0.75     0.250    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        2.28      0.75     0.500    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.36      0.75     0.600    56
  COMMERCIAL                 B        1.50      0.75     0.100    56
  PUBLIC PARK                B        0.63      0.75     0.850    56
  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
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        4.09      0.75     0.250    56
  PUBLIC PARK                B        1.15      0.75     0.850    56
  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 =  0.386
  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) =      57.30

  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        2.82      0.75     0.250    56
  PUBLIC PARK                B        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) =   10.84
```

```
  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) =      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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        0.75      0.75     0.250    56
  PUBLIC PARK                B        1.88      0.75     0.850    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.24      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) =    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        0.82      0.75     0.250    56
  PUBLIC PARK                B        2.06      0.75     0.850    56
  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 =  0.677
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        2.48      0.75     0.250    56
  PUBLIC PARK                B        2.79      0.75     0.850    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.16      0.75     0.600    56
  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) =    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        0.62      0.75     0.250    56
  PUBLIC PARK                B        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) =      72.07

  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK                B        1.44      0.75     0.850    56
  MOBILE HOME PARK           B        0.53      0.75     0.250    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.02      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) =    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) =      72.07
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 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
```

```
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.978
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 MOBILE HOME PARK           B        1.94      0.75     0.250    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) =  0.67
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.534
 SUBAREA AREA(ACRES) =   18.10      SUBAREA RUNOFF(CFS) =   26.35
 EFFECTIVE AREA(ACRES) =     66.45    AREA-AVERAGED Fm(INCH/HR) =  0.37
 AREA-AVERAGED Fp(INCH/HR) =  0.73  AREA-AVERAGED Ap =  0.50
 TOTAL AREA(ACRES) =       66.5        PEAK FLOW RATE(CFS) =      96.42

 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) = 0.62   HALFSTREET FLOOD WIDTH(FEET) =  24.18
 FLOW VELOCITY(FEET/SEC.) =  7.76   DEPTH*VELOCITY(FT*FT/SEC.) =   4.84
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  288.2 FT WITH ELEVATION-DROP =  13.0 FT, IS   56.3 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
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =     148.30
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.79
   HALFSTREET FLOOD WIDTH(FEET) =   32.36
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.84
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.39
 STREET FLOW TRAVEL TIME(MIN.) =   6.38   Tc(MIN.) =   24.36
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.649
 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
 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) =  103.26
 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) =     179.98

 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) =  34.92
 FLOW VELOCITY(FEET/SEC.) =  7.17   DEPTH*VELOCITY(FT*FT/SEC.) =   6.01
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L = 2619.3 FT WITH ELEVATION-DROP =  62.0 FT, IS  139.4 CFS,
        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 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  30.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  19.11
 PIPE-FLOW(CFS) =     179.98
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME(MIN.) =   0.89    Tc(MIN.) =  25.26
 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.) =   25.26
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.613
 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) =   12.87
 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) =     187.78
```

```
  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  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
     2       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.
   EQUIVALENT 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
```

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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
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                          Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* REDLANDS MPD  - UPDATE                                                *
* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 20968                     *
* 25-YR  HC ULTIMATE CONDITION    OCT 2013   DMALOTT                    *
 ************************************************************************

  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)
===  =====  =========  =================  ======  ===== ====== ===== =======
  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
```



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 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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.372
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.752
  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
  ".4 DWELLING/ACRE"         B        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
  "2 DWELLINGS/ACRE"         B        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) =     20.96
  TOTAL AREA(ACRES) =     10.48   PEAK FLOW RATE(CFS) =     20.96

  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  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
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 STREET LENGTH(FEET) =   427.68   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 =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =      25.82
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.41
   HALFSTREET FLOOD WIDTH(FEET) =   14.37
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.92
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.45
 STREET FLOW TRAVEL TIME(MIN.) =   1.20   Tc(MIN.) =   11.58
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.576
 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        2.43      0.75     0.900    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        0.53      0.75     0.600    56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        2.46      0.75     0.700    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.780
 SUBAREA AREA(ACRES) =    5.42      SUBAREA RUNOFF(CFS) =    9.72
 EFFECTIVE AREA(ACRES) =     15.90    AREA-AVERAGED Fm(INCH/HR) =  0.55
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.73
 TOTAL AREA(ACRES) =       15.9        PEAK FLOW RATE(CFS) =      29.03

 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) = 0.43   HALFSTREET FLOOD WIDTH(FEET) =  15.07
 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.

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 FLOW PROCESS FROM NODE  20902.00 TO NODE  20903.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1770.00  DOWNSTREAM ELEVATION(FEET) = 1758.00
 STREET LENGTH(FEET) =   465.31   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 18.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  10.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020
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 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =      33.22
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.50
   HALFSTREET FLOOD WIDTH(FEET) =   18.20
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.52
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.28
 STREET FLOW TRAVEL TIME(MIN.) =   1.72   Tc(MIN.) =   13.29
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.371
 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        2.12      0.75     0.900    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        0.54      0.75     0.600    56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        2.53      0.75     0.700    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.771
 SUBAREA AREA(ACRES) =    5.19      SUBAREA RUNOFF(CFS) =    8.38
 EFFECTIVE AREA(ACRES) =     21.09    AREA-AVERAGED Fm(INCH/HR) =  0.56
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.74
 TOTAL AREA(ACRES) =       21.1        PEAK FLOW RATE(CFS) =      34.47

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.51   HALFSTREET FLOOD WIDTH(FEET) =  18.44
 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.

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 FLOW PROCESS FROM NODE  20903.00 TO NODE  20904.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
 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

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

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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      50.49
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.60
    HALFSTREET FLOOD WIDTH(FEET) =   22.89
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.50
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.69
  STREET FLOW TRAVEL TIME(MIN.) =   1.80   Tc(MIN.) =   15.09
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.197
  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        3.95      0.75     0.900    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.03      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       15.54      0.75     0.700    56
  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 =  0.73
  TOTAL AREA(ACRES) =       42.6        PEAK FLOW RATE(CFS) =      63.19

  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
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    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      79.58
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.58
    HALFSTREET 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      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    56
  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,
         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.

****************************************************************************
  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) =     101.77
    ***STREET FLOWING FULL***
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    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        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
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  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
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.66      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        8.47      0.75     0.700    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        0.16      0.63     1.000    65
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        7.50      0.75     0.900    56
  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 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
  "3-4 DWELLINGS/ACRE"       B        0.59      0.75     0.600    56   10.44
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        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      Fp         Ap     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    56
  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)<<<<<
============================================================================
```



```
  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) =      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      Fp         Ap     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    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       PEAK FLOW RATE(CFS) =      33.32

  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  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) =      40.14
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        3.54      0.75     0.900    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.59      0.75     0.600    56
  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) =      40.14
  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<<<<<
```



```
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  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      Fp         Ap     SCS
       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    56
  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 HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      64.21
    ***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      Fp         Ap     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
```



```
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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         Ap     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    56
  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***
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  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         Ap     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
 "ORCHARDS"                 B        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) =    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) =      86.38

 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
```



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 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        4.53      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    56
 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) =   33.53
 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) =     109.97

 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) = 0.73   HALFSTREET FLOOD WIDTH(FEET) =  29.29
 FLOW VELOCITY(FEET/SEC.) =  6.49   DEPTH*VELOCITY(FT*FT/SEC.) =   4.76
 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.) =   31.46
 RAINFALL INTENSITY(INCH/HR) =   1.41
 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 =     109.97

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      108.27   22.39    1.734  0.75( 0.56) 0.75     102.8   20900.00
     2      109.97   31.46    1.414  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      218.05   22.39    1.734  0.74( 0.59) 0.80     212.2   20900.00
     2      188.63   31.46    1.414  0.74( 0.60) 0.80     256.5   20910.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     218.05    Tc(MIN.) =    22.39
```

```
  EFFECTIVE AREA(ACRES) =     212.21   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
  DEPTH OF FLOW IN  57.0 INCH PIPE IS  31.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.60
  PIPE-FLOW(CFS) =     218.05
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   0.63    Tc(MIN.) =  23.02
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.706
  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"                B        0.05      0.63     1.000    65
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"      B       11.48      0.75     0.600    56
  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) =   72.76
  EFFECTIVE AREA(ACRES) =    279.88    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) =     285.35

  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) =   0.84
  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) =   67.30
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.66
    HALFSTREET FLOOD WIDTH(FEET) =   24.86
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.28
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.46
```



```
  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      285.35   23.02    1.706  0.74( 0.57) 0.77     279.9   20900.00
      2      238.61   32.11    1.397  0.74( 0.58) 0.78     324.2   20910.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     285.35  Tc(MIN.) =   23.02
  AREA-AVERAGED Fm(INCH/HR) =  0.57  AREA-AVERAGED Fp(INCH/HR) =  0.74
  AREA-AVERAGED Ap =  0.77  EFFECTIVE AREA(ACRES) =     279.88
  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  38.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.19
  PIPE-FLOW(CFS) =     285.35
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   1.33    Tc(MIN.) =  24.35
  LONGEST FLOWPATH FROM NODE  20910.00 TO NODE  20922.00 =    8456.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20922.00 TO NODE  20922.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   24.35
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.649
  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       10.56      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"        B       31.42      0.75     0.700    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"      B       17.53      0.75     0.500    56
  MOBILE HOME PARK          B       16.71      0.75     0.250    56
  COMMERCIAL                B        2.07      0.75     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.530
  SUBAREA AREA(ACRES) =   78.29      SUBAREA RUNOFF(CFS) =   88.27
  EFFECTIVE AREA(ACRES) =    358.17   AREA-AVERAGED Fm(INCH/HR) =  0.61
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =      402.4       PEAK FLOW RATE(CFS) =     334.69

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62
```

```
 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     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
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     358.27  Tc(MIN.) =   24.44
 AREA-AVERAGED Fm(INCH/HR) =  0.53  AREA-AVERAGED Fp(INCH/HR) =  0.74
 AREA-AVERAGED Ap =  0.72  EFFECTIVE AREA(ACRES) =     358.17

****************************************************************************
 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  34.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  30.32
 PIPE-FLOW(CFS) =     358.27
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME(MIN.) =   0.88    Tc(MIN.) =  25.32
 *  25 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
 "5-7 DWELLINGS/ACRE"       B        6.04      0.75     0.500    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B       30.00      0.75     0.600    56
 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) =   38.11
 EFFECTIVE AREA(ACRES) =    394.21    AREA-AVERAGED Fm(INCH/HR) =  0.53
 AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.71
 TOTAL AREA(ACRES) =      438.5        PEAK FLOW RATE(CFS) =     385.21

 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) =  6.0       STREET HALFWIDTH(FEET) = 18.00
 DISTANCE FROM CROWN TO 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) =   26.94
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.44
```



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   HALFSTREET FLOOD WIDTH(FEET) =   15.70
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.22
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.30

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      385.21   25.32    1.611  0.74( 0.53) 0.71     394.2   20900.00
     2      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
 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.

****************************************************************************
 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
 *GIVEN BOX HEIGHT(FEET) =   4.00   ESTIMATED BOX BASEWIDTH(FEET) =    4.83
 ASSUME FULL-FLOWING BOX   BOX-FLOW VELOCITY(FEET/SEC.) =  19.93
 BOX-FLOW(CFS) =     385.21
 BOX-FLOW TRAVEL TIME(MIN.) =   1.14    Tc(MIN.) =   26.45
 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.) =   26.45
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.569
 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        6.19      0.75     0.500    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B       35.81      0.75     0.600    56
 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) =   42.77
 EFFECTIVE AREA(ACRES) =    436.21   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) =     413.12

 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  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) =    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        2.86      0.75     0.500    56
  SCHOOL                     B        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) =   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) =     413.38

  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 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
  "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         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) =    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
```

```
  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) =      38.87
    ***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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       12.11      0.75     0.600    56
  SCHOOL                     B       22.59      0.75     0.600    56
  PUBLIC PARK                B        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) =   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) =      58.95

  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) = 0.56   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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       26.74      0.75     0.600    56
  PUBLIC PARK                B        9.16      0.75     0.850    56
  SCHOOL                     B        6.76      0.75     0.600    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        6.64      0.63     1.000    65
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        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) =   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
```

```
  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  22.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.06
  PIPE-FLOW(CFS) =     115.86
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   0.76    Tc(MIN.) =  22.00
  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.) =   22.00
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.753
  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       67.33      0.75     0.600    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        8.70      0.63     1.000    65
  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) =   87.80
  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) =     200.33

  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  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
  FLOWDEPTH IN BOX IS  3.79 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  17.62
  BOX-FLOW(CFS) =     200.33
  BOX-FLOW TRAVEL TIME(MIN.) =   0.76    Tc(MIN.) =   22.76
  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.) =   22.76
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.717
  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      101.89      0.75     0.600    56
  COMMERCIAL                 B        1.19      0.75     0.100    56
  MOBILE HOME PARK           B       18.61      0.75     0.250    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        2.78      0.75     0.500    56
  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) =  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
  TOTAL AREA(ACRES) =      299.0       PEAK FLOW RATE(CFS) =     341.90

  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  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) =    4.49
  ASSUME FULL-FLOWING BOX   BOX-FLOW VELOCITY(FEET/SEC.) =  19.03
  BOX-FLOW(CFS) =     341.90
  BOX-FLOW TRAVEL TIME(MIN.) =   0.62    Tc(MIN.) =   23.38
  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.) =   23.38
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.690
  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        6.69      0.75     0.600    56
  MOBILE HOME PARK           B       28.27      0.75     0.250    56
  COMMERCIAL                 B        1.13      0.75     0.100    56
  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) =   47.35
  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) =     381.81

  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  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) =    5.54
  ASSUME FULL-FLOWING BOX   BOX-FLOW VELOCITY(FEET/SEC.) =  17.24
  BOX-FLOW(CFS) =     381.81
  BOX-FLOW TRAVEL TIME(MIN.) =   0.95    Tc(MIN.) =   24.33
  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.) =   24.33
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.650
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        3.30      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       20.77      0.75     0.600    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B       10.89      0.75     0.500    56
  MOBILE HOME PARK           B       29.98      0.75     0.250    56
  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) =   79.10
  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) =     448.86

  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  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) =    9.62
  ASSUME FULL-FLOWING BOX   BOX-FLOW VELOCITY(FEET/SEC.) =  11.67
  BOX-FLOW(CFS) =     448.86
  BOX-FLOW TRAVEL TIME(MIN.) =   0.96    Tc(MIN.) =   25.29
  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.) =   25.29
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.612
  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        6.87      0.75     0.500    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.91      0.75     0.600    56
  SCHOOL                     B        3.23      0.75     0.600    56
  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
  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) =     448.86
  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  20939.00 TO NODE  20939.00 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.) =   25.29
  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) =     411.05
  TOTAL STREAM AREA(ACRES) =     411.05
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     448.86

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      413.38   27.53    1.532  0.75( 0.51) 0.69     451.2   20900.00
      1      340.37   36.82    1.287  0.74( 0.52) 0.70     495.5   20910.00
      2      448.86   25.29    1.612  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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      858.47   25.29    1.612  0.74( 0.46) 0.62     825.5   20930.00
      2      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

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     858.47    Tc(MIN.) =    25.29
```

```
  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      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  SCHOOL                     B       57.18      0.75     0.600    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       27.41      0.75     0.600    56
```



```
  MOBILE HOME PARK           B        4.75      0.75     0.250    56
  COMMERCIAL                 B        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
  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
----------------------------------------------------------------------------
```

```
  >>>>>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  5.49 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  30.86
  BOX-FLOW(CFS) =    2033.20
  BOX-FLOW TRAVEL TIME(MIN.) =   1.12    Tc(MIN.) =   43.64
  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) =     2033.20    Tc(MIN.) =   43.64
  AREA-AVERAGED Fm(INCH/HR) =  0.49    Ybar = 0.54
  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) =      858.47    Tc(MIN.) =   39.54
  AREA-AVERAGED Fm(INCH/HR) =  0.46    Ybar = 0.53
  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= 0.36;30M= 0.73;1H= 0.96;3H= 1.64;6H= 2.29;24H= 4.80
  S-GRAPH: VALLEY(DEV.)= 90.1%;VALLEY(UNDEV.)/DESERT=  9.9%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.73; LAG(HR) = 0.58; 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) =     3993.8
  LONGEST FLOWPATH FROM NODE  20620.00 TO NODE  20940.00 =   26494.09 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0296; Lca/L=0.4,n=.0265; Lca/L=0.5,n=.0244;Lca/L=0.6,n=.0228
  TIME OF PEAK FLOW(HR) = 16.67  RUNOFF VOLUME(AF) =     775.70
  PEAK FLOW RATE(CFS) =    2515.15

********************************************************************************
  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  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 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.)
  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) =     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
```

```
  "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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.46      0.75     0.600    56
  MOBILE HOME PARK           B        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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.20      0.75     0.600    56
  MOBILE HOME PARK           B        1.83      0.75     0.250    56
  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
```



```
  TOTAL AREA(ACRES) =       11.7         PEAK FLOW RATE(CFS) =      26.63

  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        3.52      0.75     0.600    56
  MOBILE HOME PARK           B        0.19      0.75     0.250    56
  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) =      32.38

  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
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK                B        0.07      0.75     0.850    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        7.87      0.75     0.600    56
  MOBILE HOME PARK           B        1.54      0.75     0.250    56
  COMMERCIAL                 B        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
  TOTAL STREAM AREA(ACRES) =      34.38
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      62.59
  ** CONFLUENCE DATA **
  STREAM      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1      2515.15   43.99     3993.76    20620.00
     2        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
```

```
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   6.00
  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.
   EQUIVALENT 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
```



```
  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.) =   50.85
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.060
  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        5.80      0.75      0.600    56
  COMMERCIAL                 B       17.13      0.75      0.100    56
  PUBLIC PARK                B        0.39      0.75      0.850    56
  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.
   EQUIVALENT 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
```

```
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.055
 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        2.51      0.75     0.600    56
 COMMERCIAL                 B        3.07      0.75     0.100    56
 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= 0.38;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) = 0.86; 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= 0.98
 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=.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) =    2070.83
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    4747.98
 TOTAL AREA(ACRES) =    10055.3       PEAK FLOW RATE(CFS) =    4747.98

 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  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) =    4747.98    Tc(MIN.) =   51.30
 AREA-AVERAGED Fm(INCH/HR) =  0.52   Ybar = 0.55
 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
 *  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.)
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"       B        3.18      0.75     0.500    56   12.95
 COMMERCIAL                 B        4.70      0.75     0.100    56   10.12
```



```
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        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) =     20.34
 TOTAL AREA(ACRES) =      8.79   PEAK FLOW RATE(CFS) =     20.34

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.63; 6HR = 2.27; 24HR = 4.62

****************************************************************************
 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
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =      24.70
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.61
   HALFSTREET FLOOD WIDTH(FEET) =   23.32
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.13
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.29
 STREET FLOW TRAVEL TIME(MIN.) =   2.20   Tc(MIN.) =   12.32
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.482
 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        1.51      0.75     0.500    56
 COMMERCIAL                 B        2.33      0.75     0.100    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        0.44      0.75     0.600    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.293
 SUBAREA AREA(ACRES) =    4.28      SUBAREA RUNOFF(CFS) =    8.72
 EFFECTIVE AREA(ACRES) =     13.07    AREA-AVERAGED Fm(INCH/HR) =  0.22
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.30
 TOTAL AREA(ACRES) =       13.1        PEAK FLOW RATE(CFS) =      26.60

 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) = 0.62   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) =      30.07
    ***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
  COMMERCIAL                 B        1.91      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) =      31.52

  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
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----------------------------------------------------------------------------
  >>>>>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) =      34.67
    ***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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        1.22      0.75     0.500    56
  COMMERCIAL                 B        1.94      0.75     0.100    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 =  0.298
  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
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  STREET HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      38.59
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.73
    HALFSTREET FLOOD WIDTH(FEET) =   29.73
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.10
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.54
  STREET FLOW TRAVEL TIME(MIN.) =   1.60   Tc(MIN.) =   17.13
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.037
  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"       A        0.14      0.98     0.500    32
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        1.29      0.75     0.500    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.85      0.75     0.600    56
  COMMERCIAL                 B        1.55      0.75     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.76
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.360
  SUBAREA AREA(ACRES) =    3.83      SUBAREA RUNOFF(CFS) =    6.08
  EFFECTIVE AREA(ACRES) =     24.22    AREA-AVERAGED Fm(INCH/HR) =  0.23
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.31
  TOTAL AREA(ACRES) =       24.2        PEAK FLOW RATE(CFS) =      39.36

  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) = 0.74   HALFSTREET FLOOD WIDTH(FEET) =  29.91
  FLOW VELOCITY(FEET/SEC.) =  2.11   DEPTH*VELOCITY(FT*FT/SEC.) =   1.56
  LONGEST FLOWPATH FROM NODE  20960.00 TO NODE  20965.00 =    1808.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20965.00 TO NODE  20966.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  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
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  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A        0.74      0.98     0.500    32
  COMMERCIAL                 B        0.93      0.75     0.100    56
  COMMERCIAL                 B        2.70      0.75     0.100    56
  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
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  Manning's FRICTION FACTOR for Streetflow Section(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) =      48.57
    ***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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A        2.02      0.98     0.500    32
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.32      0.75     0.500    56
  COMMERCIAL                 A        0.04      0.98     0.100    32
  COMMERCIAL                 B        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):
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   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       13.57      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        3.04      0.75     0.600    56
  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 **
  STREAM      Q        Tc      AREA      HEADWATER
  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:
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  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= 0.98
  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=.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 =  0.55
  PEAK FLOW RATE(CFS)   =   4775.17
============================================================================
============================================================================
  END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

```
 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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             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 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:
========================================================================
                    --*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
```



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 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 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
  "3-4 DWELLINGS/ACRE"       B        5.92      0.75      0.600    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
```

```
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      18.90
    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        7.03      0.75     0.600    56
  SCHOOL                     B        7.98      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) =   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 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
  "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
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  21011.00 TO NODE  21012.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1462.00  DOWNSTREAM ELEVATION(FEET) = 1440.00
  STREET LENGTH(FEET) =   809.73   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) =   0.83

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.76
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.42
    HALFSTREET FLOOD WIDTH(FEET) =   14.45
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.80
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.58
  STREET FLOW TRAVEL TIME(MIN.) =   3.55   Tc(MIN.) =   16.18
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.108
  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        4.37      0.75     0.600    56
  SCHOOL                     B        1.10      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) =    5.47      SUBAREA RUNOFF(CFS) =    8.17
  EFFECTIVE AREA(ACRES) =     12.52    AREA-AVERAGED Fm(INCH/HR) =  0.45
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.60
  TOTAL AREA(ACRES) =       12.5        PEAK FLOW RATE(CFS) =      18.69

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.43   HALFSTREET FLOOD WIDTH(FEET) =  15.07
  FLOW VELOCITY(FEET/SEC.) =  3.91   DEPTH*VELOCITY(FT*FT/SEC.) =   1.67
  LONGEST FLOWPATH FROM NODE  21010.00 TO NODE  21012.00 =    1721.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21012.00 TO NODE  21013.00 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) =   312.07   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00
```



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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      20.52
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.45
    HALFSTREET FLOOD WIDTH(FEET) =   16.24
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.72
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.68
  STREET FLOW TRAVEL TIME(MIN.) =   1.40   Tc(MIN.) =   17.58
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.005
  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        0.66      0.75     0.600    56
  SCHOOL                     B        1.95      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) =    2.61      SUBAREA RUNOFF(CFS) =    3.66
  EFFECTIVE AREA(ACRES) =     15.13    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) =      21.20

  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) = 0.46   HALFSTREET FLOOD WIDTH(FEET) =  16.48
  FLOW VELOCITY(FEET/SEC.) =  3.74   DEPTH*VELOCITY(FT*FT/SEC.) =   1.71
  LONGEST FLOWPATH FROM NODE  21010.00 TO NODE  21013.00 =    2033.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21013.00 TO NODE  21013.00 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.) =   17.58
  RAINFALL INTENSITY(INCH/HR) =   2.01
  AREA-AVERAGED Fm(INCH/HR) =  0.45
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.60
  EFFECTIVE STREAM AREA(ACRES) =      15.13
  TOTAL STREAM AREA(ACRES) =      15.13
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      21.20

  ** CONFLUENCE DATA **
```

```
 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.

  ** 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

  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
  TOTAL AREA(ACRES) =       45.3
  LONGEST FLOWPATH FROM NODE  21000.00 TO NODE  21013.00 =    2712.93 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21013.00 TO NODE  21014.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  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) =      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.

  ** 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
  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

****************************************************************************
  FLOW PROCESS FROM NODE  21014.00 TO NODE  21014.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   20.99
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.803
  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       19.47      0.75     0.600    56
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  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

  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  21014.00 TO NODE  21015.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  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
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      90.21
    ***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.) =    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
  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
  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
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.55
  TOTAL AREA(ACRES) =       80.6        PEAK FLOW RATE(CFS) =      88.83

  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:
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  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) =      93.89
    ***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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.76      0.75     0.600    56
  SCHOOL                     B        3.85      0.75     0.600    56
  MOBILE HOME PARK           B        2.60      0.75     0.250    56
  PUBLIC PARK                B        0.44      0.75     0.850    56
  COMMERCIAL                 B        0.91      0.75     0.100    56
  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.

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  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      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        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
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  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      Fp         Ap     SCS
       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) =      25.28
    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
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  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
       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    56
  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) =      36.68
    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        6.35      0.75     0.250    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.47      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.17      0.75     0.600    56
  MOBILE HOME PARK           B        3.23      0.75     0.250    56
  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
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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.32      0.75     0.600    56
  COMMERCIAL                 B        1.20      0.75     0.100    56
  MOBILE HOME PARK           B        0.81      0.75     0.250    56
  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.

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 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) =      56.63
   ***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         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        2.67      0.75     0.600    56
 COMMERCIAL                 B        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
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 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  10.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        2.72      0.75     0.600    56
 COMMERCIAL                 B        2.05      0.75     0.100    56
 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
```

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  Manning's FRICTION FACTOR for Streetflow Section(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) =      67.28
    ***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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.13      0.75     0.600    56
  COMMERCIAL                 B        2.11      0.75     0.100    56
  MOBILE HOME PARK           B        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) =      92.22
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
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    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        9.68      0.75     0.100    56
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.14      0.75     0.600    56
  COMMERCIAL                 B        3.35      0.75     0.100    56
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  SCHOOL                    B        0.63      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.326
  SUBAREA AREA(ACRES) =     6.12      SUBAREA RUNOFF(CFS) =     7.69
  EFFECTIVE AREA(ACRES) =     98.68   AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.39
  TOTAL AREA(ACRES) =       98.7       PEAK FLOW RATE(CFS) =     119.94

  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  21032.00 TO NODE  21032.00 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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.62      0.75     0.600    56
  SCHOOL                     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) =     1.89      SUBAREA RUNOFF(CFS) =     2.03
  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) =     121.97

  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  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.) =   24.59
  RAINFALL INTENSITY(INCH/HR) =   1.64
  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 =     121.97

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       90.65   27.73    1.525  0.75( 0.40) 0.54      89.7   21010.00
      1       90.33   28.04    1.515  0.75( 0.40) 0.54      90.2   21000.00
      2      121.97   24.59    1.640  0.75( 0.29) 0.39     100.6   21020.00
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  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      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
      3      201.04   28.04    1.515  0.75( 0.34) 0.46     190.7   21000.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     210.51    Tc(MIN.) =    24.59
  EFFECTIVE AREA(ACRES) =     180.06   AREA-AVERAGED Fm(INCH/HR) =  0.34
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.46
  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  1.41 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  13.60
  BOX-FLOW(CFS) =     210.51
  BOX-FLOW TRAVEL TIME(MIN.) =   0.43    Tc(MIN.) =   25.02
  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.) =   25.02
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.623
  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        2.84      0.75     0.600    56
  SCHOOL                     B        2.77      0.75     0.600    56
  COMMERCIAL                 B        2.00      0.75     0.100    56
  MOBILE HOME PARK           B        6.89      0.75     0.250    56
  PUBLIC PARK                B        1.56      0.75     0.850    56
  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) =   19.00
  EFFECTIVE AREA(ACRES) =    196.12   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) =     226.74

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.39; 6HR = 2.19; 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      226.90   25.00    1.623  0.75( 0.34) 0.45     196.1   21020.00
    2      217.48   28.13    1.512  0.75( 0.34) 0.46     206.3   21010.00
    3      216.25   28.42    1.503  0.75( 0.34) 0.46     206.8   21000.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     226.90  Tc(MIN.) =   25.00
  AREA-AVERAGED Fm(INCH/HR) =  0.34  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.45  EFFECTIVE AREA(ACRES) =     196.12

****************************************************************************
  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.) =   25.00
  RAINFALL INTENSITY(INCH/HR) =   1.62
  AREA-AVERAGED Fm(INCH/HR) =  0.34
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.45
  EFFECTIVE STREAM AREA(ACRES) =     196.12
  TOTAL STREAM AREA(ACRES) =     206.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     226.90

****************************************************************************
  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
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.531
  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        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) =     23.52
  TOTAL AREA(ACRES) =     11.28   PEAK FLOW RATE(CFS) =     23.52

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26

****************************************************************************
  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) =      33.04
    ***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.) =    3.71
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.02
  STREET FLOW TRAVEL TIME(MIN.) =   2.89   Tc(MIN.) =   14.81
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.222
  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        4.00      0.75     0.600    56
  COMMERCIAL                 B        5.39      0.75     0.100    56
  SCHOOL                     B        1.37      0.75     0.600    56
  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) =   18.99
  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) =      39.38

  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) =  21.55
  FLOW VELOCITY(FEET/SEC.) =  3.93   DEPTH*VELOCITY(FT*FT/SEC.) =   2.24
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  642.5 FT WITH ELEVATION-DROP =   9.0 FT, IS   25.6 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
----------------------------------------------------------------------------
  >>>>>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  0.82 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =   9.61
```

```
  BOX-FLOW(CFS) =      39.38
  BOX-FLOW TRAVEL TIME(MIN.) =   1.55    Tc(MIN.) =   16.36
  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.) =   16.36
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.093
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       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
  SCHOOL                     B        2.94      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.590
  SUBAREA AREA(ACRES) =    5.56      SUBAREA RUNOFF(CFS) =    8.27
  EFFECTIVE AREA(ACRES) =     27.60   AREA-AVERAGED Fm(INCH/HR) =  0.28
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.37
  TOTAL AREA(ACRES) =       27.6       PEAK FLOW RATE(CFS) =      45.08

  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  21043.00 TO NODE  21043.00 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.) =   16.36
  RAINFALL INTENSITY(INCH/HR) =   2.09
  AREA-AVERAGED Fm(INCH/HR) =  0.28
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.37
  EFFECTIVE STREAM AREA(ACRES) =      27.60
  TOTAL STREAM AREA(ACRES) =      27.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      45.08

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      226.90   25.00    1.623  0.75( 0.34) 0.45     196.1   21020.00
      1      217.48   28.13    1.512  0.75( 0.34) 0.46     206.3   21010.00
      1      216.25   28.42    1.503  0.75( 0.34) 0.46     206.8   21000.00
      2       45.08   16.36    2.093  0.75( 0.28) 0.37      27.6   21040.00

  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      247.91   16.36    2.093  0.75( 0.33) 0.44     156.0   21040.00
      2      260.31   25.00    1.623  0.75( 0.33) 0.44     223.7   21020.00
      3      248.13   28.13    1.512  0.75( 0.33) 0.45     233.9   21010.00
      4      246.67   28.42    1.503  0.75( 0.33) 0.45     234.4   21000.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  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
  TOTAL AREA(ACRES) =      234.4
  LONGEST FLOWPATH FROM NODE  21000.00 TO NODE  21043.00 =    6662.97 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21043.00 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) =  1327.00  DOWNSTREAM(FEET) =  1318.00
  FLOW LENGTH(FEET) =   665.51   MANNING'S N =  0.014
  GIVEN BOX BASEWIDTH(FEET) =  12.00   GIVEN BOX HEIGHT(FEET) =   2.50
  FLOWDEPTH IN BOX IS  1.54 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  14.12
  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.

****************************************************************************
  FLOW PROCESS FROM NODE  21044.00 TO NODE  21044.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   25.78
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.594
  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        4.70      0.75     0.600    56
  COMMERCIAL                 B       13.39      0.75     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.230
  SUBAREA AREA(ACRES) =   18.09      SUBAREA RUNOFF(CFS) =   23.14
  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) =     277.44

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 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      270.39   17.12    2.037  0.75( 0.31) 0.42     174.1   21040.00
      2      278.07   25.71    1.596  0.75( 0.32) 0.43     241.8   21020.00
      3      265.06   28.81    1.491  0.75( 0.32) 0.43     252.0   21010.00
      4      263.75   29.06    1.483  0.75( 0.32) 0.43     252.5   21000.00
  NEW PEAK FLOW DATA ARE:
```

```
  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<<<<<
```



```
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  PEAK FLOW RATE(CFS) =     4775.17    Tc(MIN.) =   51.88
  AREA-AVERAGED Fm(INCH/HR) =  0.52    Ybar = 0.55
  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
   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
      2      278.07   25.71    1.596  0.75( 0.32) 0.43     241.8   21020.00
      3      265.06   28.81    1.491  0.75( 0.32) 0.43     252.0   21010.00
      4      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= 0.98
  UNIT-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.) =   52.62
  LONGEST 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<<<<<
```

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================================================================================
  MAINLINE Tc(MIN.) =   52.62
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.039
  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"       A       25.15      0.98     0.500    32
  COMMERCIAL                 A       34.08      0.98     0.100    32
  SCHOOL                     A        9.02      0.98     0.600    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        6.36      0.98     0.600    32
  COMMERCIAL                 B       60.62      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       23.64      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.87
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.286
  SUBAREA AREA(ACRES) =  158.87
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.38;30M= 0.77;1H= 1.02;3H= 1.75;6H= 2.46;24H= 5.34
  S-GRAPH: VALLEY(DEV.)= 70.3%;VALLEY(UNDEV.)/DESERT= 29.7%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.88; LAG(HR) = 0.70; Fm(INCH/HR) = 0.51; Ybar = 0.54
  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) =    10518.3
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21045.00 =   39604.08 FEET.
   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
  TIME OF PEAK FLOW(HR) = 16.75  RUNOFF VOLUME(AF) =    2180.46
  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

********************************************************************************
  FLOW PROCESS FROM NODE  21045.00 TO NODE  21046.00 IS CODE =  54
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1295.00  DOWNSTREAM(FEET) =   1250.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2744.77   CHANNEL SLOPE =  0.0164
  CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   7.50
  CHANNEL FLOW THRU SUBAREA(CFS) =    4925.52
  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  21046.00 TO NODE  21046.00 IS CODE =  81
--------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
  MAINLINE Tc(MIN.) =   54.09
```



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  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.022
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A       22.52      0.98     0.100    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        7.83      0.98     0.600    32
  COMMERCIAL                 B       38.49      0.75     0.100    56
  PUBLIC PARK                A        8.61      0.98     0.850    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.45      0.75     0.600    56
  MOBILE HOME PARK           B        0.52      0.75     0.250    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.90
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.254
  SUBAREA AREA(ACRES) =   82.42
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.38;30M= 0.77;1H= 1.02;3H= 1.74;6H= 2.46;24H= 5.33
  S-GRAPH: VALLEY(DEV.)= 70.6%;VALLEY(UNDEV.)/DESERT= 29.4%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.90; LAG(HR) = 0.72; Fm(INCH/HR) = 0.51; Ybar = 0.54
  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) =    10600.7
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21046.00 =   42348.85 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) = 16.75  RUNOFF VOLUME(AF) =    2201.61
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    4885.78
  TOTAL AREA(ACRES) =    10600.7       PEAK FLOW RATE(CFS) =    4925.52
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26

********************************************************************************
  FLOW PROCESS FROM NODE  21046.00 TO NODE  21069.00 IS CODE =  54
--------------------------------------------------------------------------------
  >>>>>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
  CHANNEL BASE(FEET) =   18.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   9.00
  CHANNEL FLOW THRU SUBAREA(CFS) =    4925.52
  FLOW VELOCITY(FEET/SEC.) =  28.11   FLOW DEPTH(FEET) =   5.89
  TRAVEL TIME(MIN.) =   1.61   Tc(MIN.) =   55.70
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21069.00 =   45066.88 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE  21069.00 TO NODE  21069.00 IS CODE =  81
--------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
  MAINLINE Tc(MIN.) =   55.70
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.004
  SUBAREA LOSS RATE DATA(AMC  II):
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 DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        5.29      0.75      0.600    56
 COMMERCIAL                 B       24.38      0.75      0.100    56
 COMMERCIAL                 A        9.45      0.98      0.100    32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A        1.36      0.98      0.600    32
 PUBLIC PARK                A        5.30      0.98      0.850    32
 PUBLIC PARK                B        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= 0.38;30M= 0.77;1H= 1.01;3H= 1.74;6H= 2.46;24H= 5.33
 S-GRAPH: VALLEY(DEV.)= 70.7%;VALLEY(UNDEV.)/DESERT= 29.3%
          MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
 Tc(HR) = 0.93; LAG(HR) = 0.74; Fm(INCH/HR) = 0.51; Ybar = 0.54
 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=.0269; Lca/L=0.4,n=.0241; Lca/L=0.5,n=.0221;Lca/L=0.6,n=.0206
 TIME OF PEAK FLOW(HR) = 16.75  RUNOFF VOLUME(AF) =    2213.48
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    4783.99
 TOTAL AREA(ACRES) =    10647.2       PEAK FLOW RATE(CFS) =    4925.52
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26

****************************************************************************
 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
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.920
 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
 "5-7 DWELLINGS/ACRE"       A        2.98      0.98      0.500    32   12.02
 COMMERCIAL                 A        5.49      0.98      0.100    32    9.40
 RESIDENTIAL
```



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 "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) =     22.26
 TOTAL AREA(ACRES) =      9.32   PEAK FLOW RATE(CFS) =     22.26

 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  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         Ap      SCS
      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
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  FLOW VELOCITY(FEET/SEC.) =  3.71   DEPTH*VELOCITY(FT*FT/SEC.) =   2.18
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         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  21051.00 TO NODE  21052.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  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) =      59.97
    ***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.) =    4.36
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.83
  STREET FLOW TRAVEL TIME(MIN.) =   2.89   Tc(MIN.) =   13.94
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.305
  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"       A        1.87      0.98     0.500    32
  COMMERCIAL                 A       17.40      0.98     0.100    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        1.43      0.98     0.600    32
  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) =   39.84
  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) =      74.05

  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) = 0.69   HALFSTREET FLOOD WIDTH(FEET) =  27.66
  FLOW VELOCITY(FEET/SEC.) =  4.62   DEPTH*VELOCITY(FT*FT/SEC.) =   3.20
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  756.6 FT WITH ELEVATION-DROP =  10.0 FT, IS   48.6 CFS,
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         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
  STREET LENGTH(FEET) =  1432.84   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =     107.33
    ***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.) =    4.76
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.81
  STREET FLOW TRAVEL TIME(MIN.) =   5.02   Tc(MIN.) =   18.95
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.917
  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"       A       17.32      0.98     0.500    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.30      0.75     0.600    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        5.92      0.75     0.500    56
  COMMERCIAL                 B        6.47      0.75     0.100    56
  COMMERCIAL                 A       13.55      0.98     0.100    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        1.00      0.98     0.600    32
  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) =   66.32
  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) =     126.63

  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) = 0.85   HALFSTREET FLOOD WIDTH(FEET) =  35.28
  FLOW VELOCITY(FEET/SEC.) =  4.94   DEPTH*VELOCITY(FT*FT/SEC.) =   4.18
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  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1432.8 FT WITH ELEVATION-DROP =  16.0 FT, IS   83.3 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<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   18.95
  RAINFALL INTENSITY(INCH/HR) =   1.92
  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 =     126.63

****************************************************************************
  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
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.903
  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
  "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                 A        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) =     14.68
  TOTAL AREA(ACRES) =      9.68   PEAK FLOW RATE(CFS) =     14.68

  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  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) =      21.76
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.66
    HALFSTREET FLOOD WIDTH(FEET) =   24.92
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.70
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.12
  STREET FLOW TRAVEL TIME(MIN.) =   3.64   Tc(MIN.) =   22.82
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.715
  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"       A        1.79      0.98     0.500    32
  COMMERCIAL                 A        7.48      0.98     0.100    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        1.27      0.98     0.600    32
  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) =   14.16
  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) =      27.19

  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) = 0.70   HALFSTREET FLOOD WIDTH(FEET) =  27.52
  FLOW VELOCITY(FEET/SEC.) =  1.82   DEPTH*VELOCITY(FT*FT/SEC.) =   1.27
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  371.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   23.7 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) =      31.68
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.68
   HALFSTREET FLOOD WIDTH(FEET) =   26.79
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.24
   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
 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"       A        1.53      0.98     0.500    32
 COMMERCIAL                 A        4.98      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) =    8.97
 EFFECTIVE AREA(ACRES) =     27.21    AREA-AVERAGED Fm(INCH/HR) =  0.22
 AREA-AVERAGED Fp(INCH/HR) =  0.98  AREA-AVERAGED Ap =  0.23
 TOTAL AREA(ACRES) =       27.2        PEAK FLOW RATE(CFS) =      34.85

 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) = 0.70   HALFSTREET FLOOD WIDTH(FEET) =  27.58
 FLOW VELOCITY(FEET/SEC.) =  2.32   DEPTH*VELOCITY(FT*FT/SEC.) =   1.62
 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) =      40.87
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.58
   HALFSTREET FLOOD WIDTH(FEET) =   21.22
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.35
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.54
 STREET FLOW TRAVEL TIME(MIN.) =   1.24   Tc(MIN.) =   25.75
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.595
 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"       A        4.16      0.98     0.500    32
 COMMERCIAL                 A        5.34      0.98     0.100    32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A        0.77      0.98     0.600    32
 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) =   12.04
 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) =      45.72

 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) = 0.60   HALFSTREET FLOOD WIDTH(FEET) =  22.16
 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.

****************************************************************************
 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) =      50.96
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.66
   HALFSTREET FLOOD WIDTH(FEET) =   25.33
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.86
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.56
```

```
  STREET FLOW TRAVEL TIME(MIN.) =   1.27   Tc(MIN.) =   27.03
  *  25 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
  "5-7 DWELLINGS/ACRE"       A        4.73      0.98     0.500    32
  COMMERCIAL                 A        3.54      0.98     0.100    32
  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) =   10.49
  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) =      54.67

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.68   HALFSTREET FLOOD WIDTH(FEET) =  26.61
  FLOW VELOCITY(FEET/SEC.) =  3.92   DEPTH*VELOCITY(FT*FT/SEC.) =   2.66
  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) =      58.73
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.67
    HALFSTREET FLOOD WIDTH(FEET) =   26.17
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.29
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.89
  STREET FLOW TRAVEL TIME(MIN.) =   5.64   Tc(MIN.) =   32.67
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.383
  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        2.04      0.98     0.600    32
```



```
  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) =    8.11
  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) =      55.70

  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) = 0.66   HALFSTREET FLOOD WIDTH(FEET) =  25.27
  FLOW VELOCITY(FEET/SEC.) =  4.24   DEPTH*VELOCITY(FT*FT/SEC.) =   2.81
  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) =      57.07
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.70
    HALFSTREET FLOOD WIDTH(FEET) =   27.58
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.81
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.66
  STREET FLOW TRAVEL TIME(MIN.) =   3.76   Tc(MIN.) =   36.43
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.295
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        1.85      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.05      0.75     0.600    56
  COMMERCIAL                 A        0.62      0.98     0.100    32
  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) =    2.74
  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) =      55.70
```

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  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.69   HALFSTREET FLOOD WIDTH(FEET) =  27.40
  FLOW VELOCITY(FEET/SEC.) =  3.76   DEPTH*VELOCITY(FT*FT/SEC.) =   2.62
  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<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   36.43
  RAINFALL INTENSITY(INCH/HR) =   1.30
  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 =      55.70

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   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
      2       55.70   36.43    1.295  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      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      172.87   18.95    1.917  0.94( 0.26) 0.27     114.9   21050.00
      2      134.82   36.43    1.295  0.95( 0.26) 0.27     142.5   21060.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     172.87    Tc(MIN.) =    18.95
  EFFECTIVE AREA(ACRES) =     114.89   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  48.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =   7.55
PIPE-FLOW(CFS) =     172.87
*NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
PIPEFLOW TRAVEL TIME(MIN.) =   3.17    Tc(MIN.) =  22.12
*  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.747
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        7.32      0.98     0.600    32
RESIDENTIAL
"3-4 DWELLINGS/ACRE"        B        5.09      0.75     0.600    56
COMMERCIAL                  A       15.30      0.98     0.100    32
COMMERCIAL                  B       41.62      0.75     0.100    56
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) =   98.95
EFFECTIVE AREA(ACRES) =    184.22    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) =     252.93

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26

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
*NOTE: STREET-CAPACITY MAY BE EXCEEDED*
STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =   80.07
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  1.00
  HALFSTREET FLOOD WIDTH(FEET) =   55.72
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.94
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.94
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       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

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 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
    2      191.26   39.78    1.228  0.92( 0.23) 0.24     211.9   21060.00
NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) =     252.93  Tc(MIN.) =   22.12
AREA-AVERAGED Fm(INCH/HR) =  0.22  AREA-AVERAGED Fp(INCH/HR) =  0.92
```

```
  AREA-AVERAGED Ap =  0.24  EFFECTIVE AREA(ACRES) =     184.22
  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 =  0.013

  USER SPECIFIED PIPE DIAMETER(INCH) =  93.00    NUMBER OF PIPES =   1
  DEPTH OF FLOW IN  93.0 INCH PIPE IS  54.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.82
  PIPE-FLOW(CFS) =     252.93
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   2.31    Tc(MIN.) =  24.43
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.646
  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        1.21      0.75     0.600    56
  COMMERCIAL                 A       33.09      0.98     0.100    32
  PUBLIC PARK                B        0.04      0.75     0.850    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.93
  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
  AREA-AVERAGED Fp(INCH/HR) =  0.92  AREA-AVERAGED Ap =  0.26
  TOTAL AREA(ACRES) =      246.2        PEAK FLOW RATE(CFS) =     277.38

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.59; 6HR = 2.19; 24HR = 4.26

  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) =   24.44
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.70
    HALFSTREET FLOOD WIDTH(FEET) =   28.91
    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,
         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
      1      283.64   24.43    1.646  0.92( 0.20) 0.22     218.6   21050.00
      2      216.17   42.25    1.185  0.92( 0.21) 0.23     246.2   21060.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     283.64  Tc(MIN.) =   24.43
  AREA-AVERAGED Fm(INCH/HR) =  0.20  AREA-AVERAGED Fp(INCH/HR) =  0.92
  AREA-AVERAGED Ap =  0.22  EFFECTIVE AREA(ACRES) =     218.56
  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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      283.64   24.43    1.646  0.92( 0.20) 0.22     218.6   21050.00
      2      216.17   42.25    1.185  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) =     4925.52    Tc(MIN.) =   55.70
  AREA-AVERAGED Fm(INCH/HR) =  0.51    Ybar = 0.54
  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= 0.38;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%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  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.
  DEPTH-AREA FACTORS: 5M = 0.66; 30M = 0.66; 1HR = 0.67;
  3HR = 0.94; 6HR = 0.97; 24HR= 0.98
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =    10893.4
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21069.00 =   45066.88 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0269; Lca/L=0.4,n=.0241; Lca/L=0.5,n=.0221;Lca/L=0.6,n=.0206
  TIME OF PEAK FLOW(HR) = 16.75  RUNOFF VOLUME(AF) =    2278.53
  PEAK FLOW RATE(CFS) =    4899.61
    (UPSTREAM NODE PEAK FLOW RATE(CFS) =    4925.52)
  PEAK FLOW RATE(CFS) USED =    4925.52

****************************************************************************
  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) =    4925.52
  FLOW VELOCITY(FEET/SEC.) =  26.93   FLOW DEPTH(FEET) =   6.07
  TRAVEL TIME(MIN.) =   1.73   Tc(MIN.) =   57.43
  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.) =   57.43
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  0.986
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B      108.13      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       17.27      0.75     0.600    56
  PUBLIC PARK                B        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= 0.38;30M= 0.77;1H= 1.01;3H= 1.74;6H= 2.45;24H= 5.29
  S-GRAPH: VALLEY(DEV.)= 71.7%;VALLEY(UNDEV.)/DESERT= 28.3%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.96; LAG(HR) = 0.77; Fm(INCH/HR) = 0.50; 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) =    11023.9
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21070.00 =   47862.35 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0262; Lca/L=0.4,n=.0235; Lca/L=0.5,n=.0216;Lca/L=0.6,n=.0202
  TIME OF PEAK FLOW(HR) = 16.83  RUNOFF VOLUME(AF) =    2316.23
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    4925.57
  TOTAL AREA(ACRES) =    11023.9       PEAK FLOW RATE(CFS) =    4925.57

  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  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.) =     57.43
  AREA-AVERAGED Fm(INCH/HR)=  0.50   Ybar =  0.53
  PEAK FLOW RATE(CFS)   =   4925.57
```



```
================================================================================
================================================================================
  END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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                          Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* 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   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
```



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 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  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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.418
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.916
  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
  "3-4 DWELLINGS/ACRE"       B        0.91      0.75     0.600    56    9.42
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        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) =     16.15
  TOTAL AREA(ACRES) =      7.47   PEAK FLOW RATE(CFS) =     16.15

  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  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
```

```
  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      Fp         Ap     SCS
       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    56
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.23      0.75     0.600    56
  RESIDENTIAL
```



```
  "2 DWELLINGS/ACRE"         B        8.43      0.75     0.700    56
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       20.18      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.62      0.75     0.600    56
  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
```

```
  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) =      82.41
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.70
    HALFSTREET FLOOD WIDTH(FEET) =   27.52
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.52
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.85
  STREET FLOW TRAVEL TIME(MIN.) =   1.21   Tc(MIN.) =   17.01
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.045
  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        2.78      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.85      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.677
  SUBAREA AREA(ACRES) =    3.63      SUBAREA RUNOFF(CFS) =    5.03
  EFFECTIVE AREA(ACRES) =     58.19    AREA-AVERAGED Fm(INCH/HR) =  0.51
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.68
  TOTAL AREA(ACRES) =       58.2        PEAK FLOW RATE(CFS) =      80.36

  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) =  27.28
  FLOW VELOCITY(FEET/SEC.) =  5.48   DEPTH*VELOCITY(FT*FT/SEC.) =   3.79
  LONGEST FLOWPATH FROM NODE  21100.00 TO NODE  21105.00 =    2989.90 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21105.00 TO NODE  21106.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 18 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1705.00  DOWNSTREAM ELEVATION(FEET) = 1690.00
  STREET LENGTH(FEET) =   562.31   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
```



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  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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         Ap     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    56
  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:
```

```
    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):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        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) =    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) =     106.86
    ***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 SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       28.69      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        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) =   39.30
  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) =     122.15

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.70   HALFSTREET FLOOD WIDTH(FEET) =  27.71
  FLOW VELOCITY(FEET/SEC.) =  8.07   DEPTH*VELOCITY(FT*FT/SEC.) =   5.66
  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) =     134.56
    ***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.) =    7.37
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.56
  STREET FLOW TRAVEL TIME(MIN.) =   2.56   Tc(MIN.) =   23.67
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.677
  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       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) =   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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        6.59      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.29      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) =    7.88      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):
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  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
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  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) =   22.09
  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

  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  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
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.621
  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
  "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) =     13.24
  TOTAL AREA(ACRES) =      6.97   PEAK FLOW RATE(CFS) =     13.24

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26

****************************************************************************
  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
```



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  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      21.83
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.41
    HALFSTREET FLOOD WIDTH(FEET) =   14.05
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.22
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.12
  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):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.67      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       10.86      0.75     0.700    56
  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) =   17.08
  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) =      27.46

  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) = 0.43   HALFSTREET FLOOD WIDTH(FEET) =  15.38
  FLOW VELOCITY(FEET/SEC.) =  5.53   DEPTH*VELOCITY(FT*FT/SEC.) =   2.40
  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) =      47.38
```

```
    ***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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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
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    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      Fp         Ap     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) =      67.34
    ***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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
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```
  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) =    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) =      67.49

  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 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        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) =     10.78
  TOTAL AREA(ACRES) =      6.85   PEAK FLOW RATE(CFS) =     10.78
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```
  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  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      Fp         Ap     SCS
       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) =   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<<<<<
```

```
 >>>>>(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) =      35.27
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.46
   HALFSTREET FLOOD WIDTH(FEET) =   16.87
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.95
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.76
 STREET FLOW TRAVEL TIME(MIN.) =   2.05   Tc(MIN.) =   18.17
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.966
 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) =   11.92      SUBAREA RUNOFF(CFS) =   15.23
 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) =      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

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.48   HALFSTREET FLOOD WIDTH(FEET) =  17.80
 FLOW VELOCITY(FEET/SEC.) =  6.14   DEPTH*VELOCITY(FT*FT/SEC.) =   2.96
 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
 STREET HALFWIDTH(FEET) = 18.00
```



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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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      Fp         Ap     SCS
      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    56
 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
```

```
 ** 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.

 ** 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

 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
 LONGEST FLOWPATH FROM NODE  21121.00 TO NODE  21126.00 =    5128.21 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  21126.00 TO NODE  21127.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
 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

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =     114.07
   ***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.) =    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):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        2.16      0.75     0.700    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        0.72      0.75     0.600    56
```



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 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):
 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.

****************************************************************************
 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) =     112.67
 FLOW VELOCITY(FEET/SEC.) =  10.16   FLOW DEPTH(FEET) =   1.29
 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 **
  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
 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

****************************************************************************
 FLOW PROCESS FROM NODE  21128.00 TO NODE  21128.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 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
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B       45.95      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) =   56.12      SUBAREA RUNOFF(CFS) =   62.41
 EFFECTIVE AREA(ACRES) =    155.75   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) =     172.56

  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  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) =     172.56
  FLOW VELOCITY(FEET/SEC.) =   9.68   FLOW DEPTH(FEET) =   1.84
  TRAVEL TIME(MIN.) =   1.79   Tc(MIN.) =   23.93
  LONGEST FLOWPATH FROM NODE  21121.00 TO NODE  21129.00 =    6842.03 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      172.56   23.93    1.666  0.74( 0.51) 0.69     155.7   21150.00
      2      165.54   26.04    1.584  0.74( 0.51) 0.69     161.4   21121.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     172.56  Tc(MIN.) =   23.93
  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 =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   23.93
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.666
  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       17.92      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) =   17.92      SUBAREA RUNOFF(CFS) =   19.64
  EFFECTIVE AREA(ACRES) =    173.67   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) =     181.07

  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  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      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.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      156.61   25.58    1.601  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
      1      336.31   23.93    1.666  0.75( 0.51) 0.68     322.0   21150.00
      2      331.91   25.58    1.601  0.75( 0.51) 0.68     336.7   21100.00
      3      327.87   26.04    1.584  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) =      336.31  Tc(MIN.) =   23.934
  EFFECTIVE AREA(ACRES) =    322.04  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  37.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  22.57
  PIPE-FLOW(CFS) =     336.31
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   1.18    Tc(MIN.) =  25.11
  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.) =   25.11
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.619
  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       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)     Ap     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
      3      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      Fp         Ap     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"                 B        1.50      0.63     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
```



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  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      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) =      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
```

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  STREET HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =       9.59
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.43
    HALFSTREET FLOOD WIDTH(FEET) =   15.30
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.95
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.84
  STREET FLOW TRAVEL TIME(MIN.) =   6.44   Tc(MIN.) =   14.19
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.280
  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        4.85      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) =    7.99
  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) =      11.57

  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) = 0.46   HALFSTREET FLOOD WIDTH(FEET) =  16.48
  FLOW VELOCITY(FEET/SEC.) =  2.04   DEPTH*VELOCITY(FT*FT/SEC.) =   0.93
  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

    **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      Fp         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) =   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
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  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        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
  PIPE-FLOW(CFS) =      28.84
  *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      Fp         Ap     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) =   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) =      49.17

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26

  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) =   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     SCS
       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*
```

```
  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<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  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 =      49.17

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     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)     Ap     Ae     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
  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
```



```
  LONGEST FLOWPATH FROM NODE  21100.00 TO NODE  21165.00 =   11365.46 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     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
  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) =     447.21

****************************************************************************
  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
  *  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 BROUSH"                B        8.73      0.61     1.000    66   17.34
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"         B        0.90      0.75     0.600    56   10.12
  RESIDENTIAL
  "2 DWELLINGS/ACRE"           B        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) =     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
  CHANNEL FLOW THRU SUBAREA(CFS) =      19.39
  FLOW VELOCITY(FEET/SEC.) =   5.65   FLOW DEPTH(FEET) =   0.83
  TRAVEL TIME(MIN.) =   1.81   Tc(MIN.) =   11.93
  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.) =   11.93
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.530
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       15.02      0.61     1.000    66
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        4.09      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        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) =   33.61
  EFFECTIVE 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) =      50.67

  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  21154.40 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) =      50.67
  FLOW VELOCITY(FEET/SEC.) =   5.41   FLOW DEPTH(FEET) =   1.37
  TRAVEL TIME(MIN.) =   2.69   Tc(MIN.) =   14.62
  LONGEST 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.) =   14.62
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.239
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
```



```
  "OPEN BRUSH"               B       17.09      0.61     1.000    66
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        4.24      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.47      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) =   21.80      SUBAREA RUNOFF(CFS) =   32.31
  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) =      75.37

  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  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) =      75.37
  FLOW VELOCITY(FEET/SEC.) =   5.05   FLOW DEPTH(FEET) =   1.73
  TRAVEL TIME(MIN.) =   3.94   Tc(MIN.) =   18.56
  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.) =   18.56
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.941
  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        4.30      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       39.32      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        7.87      0.61     1.000    66
  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) =   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
  TOTAL AREA(ACRES) =      102.4       PEAK FLOW RATE(CFS) =     127.01

  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

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =     136.57
    ***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      Fp         Ap     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      Fp         Ap     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) =   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 Tc :
  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
```

```
****************************************************************************
  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 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
  "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      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) =   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      Fp         Ap      SCS
       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) =   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
```

```
 ** CONFLUENCE DATA **
  STREAM        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       155.58   21.16    1.794  0.69( 0.54) 0.78     137.4   21154.00
     2        40.83   13.92    2.307  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        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       184.87   13.92    2.307  0.70( 0.52) 0.74     114.8   21160.00
     2       185.14   21.16    1.794  0.69( 0.52) 0.75     161.8   21154.00

 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
 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
 DEPTH OF FLOW IN  54.0 INCH PIPE IS  30.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  20.07
 PIPE-FLOW(CFS) =     185.14
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME(MIN.) =   0.55    Tc(MIN.) =  21.72
 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.) =   21.72
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.766
 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       13.33      0.75     0.600    56
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 B        1.74      0.63     1.000    65
 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) =   17.59
 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) =     198.71

 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        Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       203.15   14.51    2.250  0.70( 0.51) 0.73     129.9   21160.00
     2       198.43   21.75    1.765  0.70( 0.52) 0.74     176.9   21154.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     203.15  Tc(MIN.) =   14.51
 AREA-AVERAGED Fm(INCH/HR) =  0.51  AREA-AVERAGED Fp(INCH/HR) =  0.70
 AREA-AVERAGED Ap =  0.73  EFFECTIVE AREA(ACRES) =     129.88

****************************************************************************
 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  28.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  23.65
 PIPE-FLOW(CFS) =     203.15
 *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.

****************************************************************************
 FLOW PROCESS FROM NODE  21165.00 TO NODE  21165.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   15.38
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.173
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 SCHOOL                     B        1.72      0.75     0.600    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B       10.42      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) =   12.14      SUBAREA RUNOFF(CFS) =   18.83
 EFFECTIVE AREA(ACRES) =    142.02   AREA-AVERAGED Fm(INCH/HR) =  0.51
 AREA-AVERAGED Fp(INCH/HR) =  0.70  AREA-AVERAGED Ap =  0.72
 TOTAL AREA(ACRES) =      189.1       PEAK FLOW RATE(CFS) =     212.94

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26

****************************************************************************
```

```
  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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     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 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
   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 FROM NODE  21100.00 TO NODE  21165.00 =   11365.46 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    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
----------------------------------------------------------------------------
  >>>>>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= 0.98;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
  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
```



```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       28.30      0.75     0.600    56
  SCHOOL                     B       18.42      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) =   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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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= 0.37;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.
   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) = 16.50  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
```



```
****************************************************************************
  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
```

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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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             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 21248                     *
* 25-YR  HC ULTIMATE CONDITION    OCT 2013   DMALOTT                    *
 ************************************************************************

  FILE NAME: LR0212ZZ.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
```



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 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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.219
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.954
  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.)
  SCHOOL                     B        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
  "2 DWELLINGS/ACRE"         B        4.38      0.75     0.700    56    9.80
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.673
  SUBAREA RUNOFF(CFS) =     13.28
  TOTAL 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)<<<<<
========================================================================
  UPSTREAM ELEVATION(FEET) = 1707.00  DOWNSTREAM ELEVATION(FEET) = 1695.00
  STREET LENGTH(FEET) =   243.63   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) =   0.74

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.27
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.40
    HALFSTREET FLOOD WIDTH(FEET) =   12.32
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.77
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.93
  STREET FLOW TRAVEL TIME(MIN.) =   0.85   Tc(MIN.) =   10.07
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.801
  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        1.00      0.75     0.600    56
  SCHOOL                     B        1.16      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        0.69      0.75     0.700    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.624
  SUBAREA AREA(ACRES) =    2.85      SUBAREA RUNOFF(CFS) =    5.99
  EFFECTIVE AREA(ACRES) =      8.87    AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.66
  TOTAL AREA(ACRES) =        8.9        PEAK FLOW RATE(CFS) =      18.44

  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) = 0.42   HALFSTREET FLOOD WIDTH(FEET) =  12.96
  FLOW VELOCITY(FEET/SEC.) =  4.93   DEPTH*VELOCITY(FT*FT/SEC.) =   2.06
  LONGEST FLOWPATH FROM NODE  21200.00 TO NODE  21202.00 =     813.59 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21202.00 TO NODE  21203.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 18 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1695.00  DOWNSTREAM ELEVATION(FEET) = 1675.00
  STREET LENGTH(FEET) =   482.35   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
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  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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      Fp         Ap     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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      42.49
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.53
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  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         Ap     SCS
      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        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) =      46.21

 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) = 0.54   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) =      52.34
   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):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        6.52      0.75     0.600    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 =  0.600
 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         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
 SUBAREA AREA(ACRES) =    5.38      SUBAREA RUNOFF(CFS) =    7.89
 EFFECTIVE AREA(ACRES) =     41.46    AREA-AVERAGED Fm(INCH/HR) =  0.50
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  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) =      65.63
    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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 AREA(ACRES) =    6.52      SUBAREA RUNOFF(CFS) =    8.78
  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) =      65.03

  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
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  FLOW VELOCITY(FEET/SEC.) =  5.61   DEPTH*VELOCITY(FT*FT/SEC.) =   3.54
  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      Fp         Ap     SCS
       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    56
  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) =      71.09

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26

  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)<<<<<
```

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==========================================================================
  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      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        B        0.99      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"          B        2.98      0.75     0.700    56
  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) =      71.42

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26

  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
  BOX-FLOW(CFS) =      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.
```



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****************************************************************************
  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         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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 =  0.600
  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 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.)
  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) =     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
----------------------------------------------------------------------------
```

```
  >>>>>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) =      28.17
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.49
    HALFSTREET FLOOD WIDTH(FEET) =   17.96
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.21
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.04
  STREET FLOW TRAVEL TIME(MIN.) =   7.73   Tc(MIN.) =   21.64
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.770
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  SCHOOL                     B        3.65      0.75     0.600    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.28      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       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) =   23.09
  EFFECTIVE AREA(ACRES) =     29.92    AREA-AVERAGED Fm(INCH/HR) =  0.48
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.64
  TOTAL AREA(ACRES) =       29.9        PEAK FLOW RATE(CFS) =      34.75

  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) =  18.50
  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  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) =      42.18
    ***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.) =    5.95
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.95
  STREET FLOW TRAVEL TIME(MIN.) =   5.99   Tc(MIN.) =   27.64
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.529
  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       14.39      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.85      0.75     0.600    56
  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) =   14.81
  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) =      43.07

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.50   HALFSTREET FLOOD WIDTH(FEET) =  18.00
  FLOW VELOCITY(FEET/SEC.) =  6.00   DEPTH*VELOCITY(FT*FT/SEC.) =   2.99
  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
```

```
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.542
 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        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) =       9.74
 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         Ap      SCS
      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) =   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      Fp         Ap      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    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) =    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
```

```
  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 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.)
  PUBLIC PARK                B        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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK                B        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
      2       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      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       39.57   15.67    2.149  0.75( 0.53) 0.70      27.1   21213.10
      2       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
```

```
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   1.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      39.57
  FLOW VELOCITY(FEET/SEC.) =   5.56   FLOW DEPTH(FEET) =   0.84
  TRAVEL TIME(MIN.) =   1.74   Tc(MIN.) =   17.41
  LONGEST FLOWPATH FROM NODE  21213.10 TO NODE  21214.00 =    2211.33 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       39.57   17.41    2.017  0.75( 0.53) 0.70      27.1   21213.10
      2       39.57   17.41    2.017  0.75( 0.53) 0.70      27.1   21210.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =      39.57  Tc(MIN.) =   17.41
  AREA-AVERAGED Fm(INCH/HR) =  0.53  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.70  EFFECTIVE AREA(ACRES) =      27.11

****************************************************************************
  FLOW PROCESS FROM NODE  21214.00 TO NODE  21214.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   17.41
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.017
  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        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) =    6.28
  EFFECTIVE AREA(ACRES) =     31.75   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) =      42.64

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26

****************************************************************************
  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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       42.64   17.41    2.017  0.75( 0.52) 0.70      31.7   21213.10
      2       42.64   17.41    2.017  0.75( 0.52) 0.70      31.8   21210.00
  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
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       43.07   27.64    1.529  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       82.55   17.41    2.017  0.75( 0.51) 0.68      60.8   21213.10
      2       82.55   17.41    2.017  0.75( 0.51) 0.68      60.8   21210.00
      3       71.75   27.64    1.529  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) =       82.55  Tc(MIN.) =   17.410
  EFFECTIVE AREA(ACRES) =     60.83  AREA-AVERAGED Fm(INCH/HR) =  0.51
  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 #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1540.00  DOWNSTREAM ELEVATION(FEET) = 1520.00
  STREET LENGTH(FEET) =   601.35   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) =   0.70

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      88.58
    ***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.) =    6.80
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.32
  STREET FLOW TRAVEL TIME(MIN.) =   1.47   Tc(MIN.) =   18.88
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.921
  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        0.90      0.75     0.600    56
  RESIDENTIAL
```

```
"2 DWELLINGS/ACRE"         B        8.64      0.75     0.700    56
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) =   12.06
EFFECTIVE AREA(ACRES) =     70.37    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) =      89.36

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) = 0.64   HALFSTREET FLOOD WIDTH(FEET) =  24.91
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  21215.00 TO NODE  21215.00 IS CODE =  11
----------------------------------------------------------------------------
>>>>>CONFLUENCE MEMORY BANK # 2 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       89.36   18.88    1.921  0.75( 0.51) 0.68      70.4   21213.10
    2       89.36   18.88    1.921  0.75( 0.51) 0.68      70.4   21210.00
    3       76.59   29.18    1.480  0.75( 0.51) 0.68      87.5   21213.30
LONGEST FLOWPATH FROM NODE  21213.30 TO NODE  21215.00 =    5452.99 FEET.

** MEMORY BANK #  2 CONFLUENCE DATA **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 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
LONGEST FLOWPATH FROM NODE  21200.00 TO NODE  21215.00 =    5371.61 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 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
    2      162.63   18.88    1.921  0.75( 0.50) 0.67     127.5   21210.00
    3      161.01   21.67    1.769  0.75( 0.50) 0.67     140.5   21200.00
    4      134.63   29.18    1.480  0.75( 0.50) 0.67     153.0   21213.30
  TOTAL AREA(ACRES) =       153.0

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =      162.63  Tc(MIN.) =   18.883
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
LONGEST FLOWPATH FROM NODE  21213.30 TO NODE  21215.00 =    5452.99 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  21215.00 TO NODE  21215.00 IS CODE =  12
----------------------------------------------------------------------------
>>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================
```



```
****************************************************************************
FLOW PROCESS FROM NODE  21215.00 TO NODE  21216.00 IS CODE =  48
----------------------------------------------------------------------------
>>>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =  1520.00  DOWNSTREAM(FEET) =  1470.00
FLOW LENGTH(FEET) =  1371.54   MANNING'S N =  0.014
GIVEN BOX BASEWIDTH(FEET) =   6.00   GIVEN BOX HEIGHT(FEET) =   3.00
FLOWDEPTH IN BOX IS  1.39 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  19.56
BOX-FLOW(CFS) =     162.63
BOX-FLOW TRAVEL TIME(MIN.) =   1.17    Tc(MIN.) =   20.05
LONGEST FLOWPATH FROM NODE  21213.30 TO NODE  21216.00 =    6824.53 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  21216.00 TO NODE  21216.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
MAINLINE Tc(MIN.) =   20.05
*  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.853
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       23.70      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) =   23.70      SUBAREA RUNOFF(CFS) =   29.95
EFFECTIVE AREA(ACRES) =    151.19   AREA-AVERAGED Fm(INCH/HR) =  0.50
AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.66
TOTAL AREA(ACRES) =      176.7       PEAK FLOW RATE(CFS) =     184.78

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       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      185.71   19.93    1.860  0.75( 0.50) 0.66     151.2   21210.00
    2      185.27   19.99    1.857  0.75( 0.50) 0.66     151.2   21213.10
    3      181.35   22.66    1.722  0.75( 0.50) 0.66     164.2   21200.00
    4      151.92   30.17    1.450  0.75( 0.49) 0.66     176.7   21213.30
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
AREA-AVERAGED Ap =  0.66  EFFECTIVE AREA(ACRES) =     151.18

****************************************************************************
FLOW PROCESS FROM NODE  21216.00 TO NODE  21217.00 IS CODE =  48
----------------------------------------------------------------------------
>>>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =  1470.00  DOWNSTREAM(FEET) =  1415.00
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  1.29 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  20.62
```

```
  BOX-FLOW(CFS) =     185.71
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       12.77      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) =   12.77      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) =     192.84

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   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
      3      189.39   23.60    1.681  0.75( 0.49) 0.66     177.0   21200.00
      4      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
```



```
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.720
  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       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
  TOTAL AREA(ACRES) =      209.2       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       Q      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
      2      204.47   22.62    1.724  0.75( 0.49) 0.65     183.7   21213.10
      3      200.50   25.09    1.620  0.75( 0.49) 0.65     196.7   21200.00
      4      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) =     183.68

****************************************************************************
  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      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  PUBLIC PARK                B        8.02      0.75     0.850    56   12.41
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        0.68      0.75     0.700    56   11.25
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        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
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.88      0.75     0.600    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        9.97      0.63     1.000    65
  PUBLIC PARK                B        3.94      0.75     0.850    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        2.50      0.75     0.700    56
  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
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  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       11.55      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) =   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
```

```
  ***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      Fp         Ap     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
 "ORCHARDS"                 B        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) =      70.22
  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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        3.82      0.75     0.600    56
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 B        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) =    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    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) =   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       PEAK FLOW RATE(CFS) =      86.73

 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  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 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
  "3-4 DWELLINGS/ACRE"       B        4.58      0.75     0.600    56    9.38
  SCHOOL                     B        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) =     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 Streetflow Section(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) =      14.59
    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.65      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) =    4.65      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
```

```
  STREET FLOW TRAVEL TIME(MIN.) =   3.84   Tc(MIN.) =   16.54
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.080
  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        9.55      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) =    9.55      SUBAREA RUNOFF(CFS) =   14.02
  EFFECTIVE AREA(ACRES) =     18.88    AREA-AVERAGED Fm(INCH/HR) =  0.45
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.60
  TOTAL AREA(ACRES) =       18.9        PEAK FLOW RATE(CFS) =      27.72

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.58   HALFSTREET FLOOD WIDTH(FEET) =  21.02
  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.

****************************************************************************
  FLOW PROCESS FROM NODE  21233.00 TO NODE  21233.00 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.) =   16.54
  RAINFALL INTENSITY(INCH/HR) =   2.08
  AREA-AVERAGED Fm(INCH/HR) =  0.45
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.60
  EFFECTIVE STREAM AREA(ACRES) =      18.88
  TOTAL STREAM AREA(ACRES) =      18.88
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      27.72

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   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
      2       27.72   16.54    2.080  0.75( 0.45) 0.60      18.9   21230.00

  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      110.84   16.54    2.080  0.72( 0.51) 0.71      78.3   21230.00
      2      109.66   21.09    1.798  0.72( 0.51) 0.71      94.7   21220.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     110.84    Tc(MIN.) =    16.54
  EFFECTIVE AREA(ACRES) =      78.32   AREA-AVERAGED Fm(INCH/HR) =  0.51
  AREA-AVERAGED Fp(INCH/HR) =  0.72  AREA-AVERAGED Ap =  0.71
```



```
  TOTAL AREA(ACRES) =       94.7
  LONGEST FLOWPATH FROM NODE  21220.00 TO NODE  21233.00 =    4438.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21233.00 TO NODE  21234.00 IS CODE =  48
----------------------------------------------------------------------------
  >>>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1423.00  DOWNSTREAM(FEET) =  1373.00
  FLOW LENGTH(FEET) =  1343.35   MANNING'S N =  0.014
  GIVEN BOX BASEWIDTH(FEET) =   8.00   GIVEN BOX HEIGHT(FEET) =   1.50
  FLOWDEPTH IN BOX IS  0.86 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  16.16
  BOX-FLOW(CFS) =     110.84
  BOX-FLOW TRAVEL TIME(MIN.) =   1.39    Tc(MIN.) =   17.92
  LONGEST FLOWPATH FROM NODE  21220.00 TO NODE  21234.00 =    5781.89 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21234.00 TO NODE  21234.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   17.92
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.982
  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       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) =   42.13
  EFFECTIVE AREA(ACRES) =    108.85   AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.72  AREA-AVERAGED Ap =  0.68
  TOTAL AREA(ACRES) =      125.2       PEAK FLOW RATE(CFS) =     146.06

  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       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      146.54   17.85    1.987  0.72( 0.49) 0.68     108.9   21230.00
      2      139.84   22.34    1.737  0.72( 0.50) 0.69     125.2   21220.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     146.54  Tc(MIN.) =   17.85
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.72
  AREA-AVERAGED Ap =  0.68  EFFECTIVE AREA(ACRES) =     108.85

****************************************************************************
  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  0.85 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  11.50
  BOX-FLOW(CFS) =     146.54
  BOX-FLOW TRAVEL TIME(MIN.) =   1.21    Tc(MIN.) =   19.06
  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.) =   19.06
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.910
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        8.16      0.75     0.250    56
  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) =   20.94
  EFFECTIVE AREA(ACRES) =    123.31   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) =     159.99

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.56; 6HR = 2.12; 24HR = 4.26

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      160.40   18.99    1.914  0.73( 0.47) 0.65     123.3   21230.00
      2      152.27   23.45    1.687  0.72( 0.48) 0.66     139.7   21220.00
  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
  AREA-AVERAGED Ap =  0.65  EFFECTIVE AREA(ACRES) =     123.31

****************************************************************************
  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  0.85 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =   6.08
  BOX-FLOW(CFS) =     160.40
  BOX-FLOW TRAVEL TIME(MIN.) =   0.63    Tc(MIN.) =   19.63
  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
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      160.40   19.60    1.879  0.73( 0.47) 0.65     123.3   21230.00
      2      152.27   24.03    1.662  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      205.17   22.53    1.728  0.75( 0.49) 0.65     183.7   21210.00
      2      204.47   22.62    1.724  0.75( 0.49) 0.65     183.7   21213.10
      3      200.50   25.09    1.620  0.75( 0.49) 0.65     196.7   21200.00
      4      168.69   32.63    1.384  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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      360.55   19.60    1.879  0.74( 0.48) 0.65     283.1   21230.00
      2      360.18   22.53    1.728  0.74( 0.48) 0.65     317.8   21210.00
      3      359.32   22.62    1.724  0.74( 0.48) 0.65     318.1   21213.10
      4      354.48   24.03    1.662  0.74( 0.48) 0.65     330.8   21220.00
      5      347.30   25.09    1.620  0.74( 0.48) 0.65     336.4   21200.00
      6      285.18   32.63    1.384  0.74( 0.48) 0.65     348.9   21213.30
    TOTAL AREA(ACRES) =       348.9

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      360.55  Tc(MIN.) =   19.596
  EFFECTIVE AREA(ACRES) =    283.08  AREA-AVERAGED Fm(INCH/HR) =  0.48
  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.

****************************************************************************
  FLOW PROCESS FROM NODE  21236.00 TO NODE  21236.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  21236.00 TO NODE  21246.00 IS CODE =  48
----------------------------------------------------------------------------
  >>>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT)<<<<<
============================================================================
  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  1.98 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  20.24
  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  21246.00 TO NODE  21246.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
```

```
==========================================================================
  MAINLINE Tc(MIN.) =   21.22
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.791
  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
  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) =   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
  TOTAL AREA(ACRES) =      406.2       PEAK FLOW RATE(CFS) =     411.67

  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       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      413.03   21.13    1.796  0.74( 0.45) 0.61     340.4   21230.00
      2      409.22   23.99    1.664  0.74( 0.45) 0.61     375.2   21210.00
      3      409.37   24.00    1.664  0.74( 0.45) 0.61     375.5   21213.10
      4      403.87   25.34    1.610  0.74( 0.45) 0.61     388.1   21220.00
      5      396.35   26.34    1.573  0.74( 0.45) 0.62     393.7   21200.00
      6      327.77   33.89    1.352  0.74( 0.46) 0.62     406.2   21213.30
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     413.03  Tc(MIN.) =   21.13
  AREA-AVERAGED Fm(INCH/HR) =  0.45  AREA-AVERAGED Fp(INCH/HR) =  0.74
  AREA-AVERAGED Ap =  0.61  EFFECTIVE AREA(ACRES) =     340.44

**************************************************************************
  FLOW PROCESS FROM NODE  21246.00 TO NODE 212146.00 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.) =   21.13
  RAINFALL INTENSITY(INCH/HR) =   1.80
  AREA-AVERAGED Fm(INCH/HR) =  0.45
  AREA-AVERAGED Fp(INCH/HR) =  0.74
  AREA-AVERAGED Ap =  0.61
  EFFECTIVE STREAM AREA(ACRES) =     340.44
  TOTAL STREAM AREA(ACRES) =     406.21
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     413.03

**************************************************************************
  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
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.697
  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
  "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) =     13.72
  TOTAL AREA(ACRES) =      6.78   PEAK FLOW RATE(CFS) =     13.72

  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  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) =      24.50
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.46
    HALFSTREET FLOOD WIDTH(FEET) =   15.31
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.84
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.25
  STREET FLOW TRAVEL TIME(MIN.) =   4.65   Tc(MIN.) =   15.38
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.173
  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       13.82      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) =   13.82      SUBAREA RUNOFF(CFS) =   21.44
  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) =      31.96
```

```
  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) =      41.53
    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       14.61      0.75     0.600    56
  COMMERCIAL                 B        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) =   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.

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```



```
  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) =      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      Fp         Ap     SCS
       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) =   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
```

```
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      64.13
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.63
    HALFSTREET FLOOD WIDTH(FEET) =   23.57
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.58
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.51
  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     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       11.63      0.75     0.600    56
  SCHOOL                     B        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)<<<<<
============================================================================
  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

  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) =      69.39
    ***STREET FLOWING FULL***
    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
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.70      0.75     0.600    56
  MOBILE HOME PARK           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
  AREA-AVERAGED Ap =  0.58
  EFFECTIVE STREAM AREA(ACRES) =      74.32
  TOTAL STREAM AREA(ACRES) =      74.32
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      67.24

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      413.03   21.13    1.796  0.74( 0.45) 0.61     340.4   21230.00
      1      409.22   23.99    1.664  0.74( 0.45) 0.61     375.2   21210.00
      1      409.37   24.00    1.664  0.74( 0.45) 0.61     375.5   21213.10
      1      403.87   25.34    1.610  0.74( 0.45) 0.61     388.1   21220.00
      1      396.35   26.34    1.573  0.74( 0.45) 0.62     393.7   21200.00
      1      327.77   33.89    1.352  0.74( 0.46) 0.62     406.2   21213.30
      2       67.24   30.64    1.437  0.75( 0.43) 0.58      74.3   21240.00
```

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	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	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

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 475.96 Tc(MIN.) = 21.13
EFFECTIVE AREA(ACRES) = 391.69 AREA-AVERAGED Fm(INCH/HR) = 0.45
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 21246.00 TO NODE 21247.00 IS CODE = 48

>>>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT)<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 1311.00 DOWNSTREAM(FEET) = 1290.00
FLOW LENGTH(FEET) = 1258.84 MANNING'S N = 0.014
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
BOX-FLOW(CFS) = 475.96
BOX-FLOW TRAVEL TIME(MIN.) = 1.13 Tc(MIN.) = 22.26
LONGEST FLOWPATH FROM NODE 21213.30 TO NODE 21247.00 = 13319.44 FEET.

****
FLOW PROCESS FROM NODE 21247.00 TO NODE 21247.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==
MAINLINE Tc(MIN.) = 22.26
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 1.740
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"3-4 DWELLINGS/ACRE"	B	23.54	0.75	0.600	56
COMMERCIAL	B	1.26	0.75	0.100	56
MOBILE HOME PARK	B	0.22	0.75	0.250	56
AGRICULTURAL FAIR COVER					
"ORCHARDS"	B	1.80	0.63	1.000	65

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.73
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.600
SUBAREA AREA(ACRES) = 26.82 SUBAREA RUNOFF(CFS) = 31.35
EFFECTIVE AREA(ACRES) = 418.51 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) = 487.81

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 NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	488.88	22.20	1.743	0.74(0.45)	0.60	418.5	21230.00
2	487.36	24.96	1.625	0.74(0.45)	0.61	460.5	21213.10
3	486.33	25.00	1.623	0.74(0.45)	0.61	460.2	21210.00
4	482.74	26.25	1.576	0.74(0.45)	0.61	476.4	21220.00
5	476.06	27.21	1.543	0.74(0.45)	0.61	484.5	21200.00
6	434.72	31.49	1.413	0.74(0.45)	0.61	502.0	21240.00
7	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) = 418.51

****
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.) = 30.63
AREA-AVERAGED Fm(INCH/HR) = 0.49 Ybar = 0.57
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) = 711.09 Tc(MIN.) = 30.63
AREA-AVERAGED Fm(INCH/HR) = 0.49 Ybar = 0.57
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 <<<<<
==

****
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  51.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  27.24
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        0.01      0.75     0.250    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        7.68      0.75     0.600    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        2.53      0.63     1.000    65
  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 **
```



```
  PEAK FLOW RATE(CFS) =      716.97    Tc(MIN.) =   31.46
  AREA-AVERAGED Fm(INCH/HR) =  0.49    Ybar = 0.57
  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)     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
      2      487.36   24.96    1.625  0.74( 0.45) 0.61     460.5   21213.10
      3      486.33   25.00    1.623  0.74( 0.45) 0.61     460.2   21210.00
      4      482.74   26.25    1.576  0.74( 0.45) 0.61     476.4   21220.00
      5      476.06   27.21    1.543  0.74( 0.45) 0.61     484.5   21200.00
      6      434.72   31.49    1.413  0.74( 0.45) 0.61     502.0   21240.00
      7      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= 1.00
  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=.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<<<<<
```

```
================================================================================
  MAINLINE Tc(MIN.) =   31.77
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.406
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B       37.17      0.75     0.250    56
  COMMERCIAL                 B       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) =     1340.4
  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
```

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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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             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 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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.326
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.759
  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   10.98
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        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) =     10.51
  TOTAL AREA(ACRES) =      5.18   PEAK FLOW RATE(CFS) =     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
```

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =      12.74
   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      Fp         Ap     SCS
      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) =      14.33

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00

 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
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 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      Fp         Ap     SCS
      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    56
 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
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    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.43
  STREET FLOW TRAVEL TIME(MIN.) =   0.46   Tc(MIN.) =   12.70
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.438
  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        1.38      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 =  0.675
  SUBAREA AREA(ACRES) =    1.83      SUBAREA RUNOFF(CFS) =    3.18
  EFFECTIVE AREA(ACRES) =     11.65    AREA-AVERAGED Fm(INCH/HR) =  0.51
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.68
  TOTAL AREA(ACRES) =       11.6        PEAK FLOW RATE(CFS) =      20.23

  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) = 0.36   HALFSTREET FLOOD WIDTH(FEET) =  11.48
  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.

****************************************************************************
  FLOW PROCESS FROM NODE  21304.00 TO NODE  21305.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1600.00  DOWNSTREAM ELEVATION(FEET) = 1580.00
  STREET LENGTH(FEET) =   267.45   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      23.88
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.40
    HALFSTREET FLOOD WIDTH(FEET) =   13.59
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.08
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.42
  STREET FLOW TRAVEL TIME(MIN.) =   0.73   Tc(MIN.) =   13.43
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.357
  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        0.80      0.75     0.600    56
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  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        3.59      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) =    4.39      SUBAREA RUNOFF(CFS) =    7.30
  EFFECTIVE AREA(ACRES) =     16.04    AREA-AVERAGED Fm(INCH/HR) =  0.51
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.68
  TOTAL AREA(ACRES) =       16.0        PEAK FLOW RATE(CFS) =      26.68

  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) = 0.41   HALFSTREET FLOOD WIDTH(FEET) =  14.21
  FLOW VELOCITY(FEET/SEC.) =  6.24   DEPTH*VELOCITY(FT*FT/SEC.) =   2.56
  LONGEST FLOWPATH FROM NODE  21300.00 TO NODE  21305.00 =    1528.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21305.00 TO NODE  21306.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  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

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      35.46
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.46
    HALFSTREET FLOOD WIDTH(FEET) =   16.79
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.04
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.79
  STREET FLOW TRAVEL TIME(MIN.) =   1.21   Tc(MIN.) =   14.64
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.238
  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        8.99      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.29      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.680
  SUBAREA AREA(ACRES) =   11.28      SUBAREA RUNOFF(CFS) =   17.55
  EFFECTIVE AREA(ACRES) =     27.32    AREA-AVERAGED Fm(INCH/HR) =  0.51
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.68
  TOTAL AREA(ACRES) =       27.3        PEAK FLOW RATE(CFS) =      42.51
```

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  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) =      53.58
    ***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      Fp         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) =      62.43

  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
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  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) =      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      Fp         Ap     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    56
  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) =      73.12

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.36; 30M = 0.73; 1HR = 0.96; 3HR = 1.52; 6HR = 2.04; 24HR = 4.00

  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)<<
```

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==========================================================================
  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      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) =   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<<<<<
==========================================================================
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  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       18.20      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) =   18.20      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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       19.39      0.75     0.600    56
  SCHOOL                     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) =   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
```

```
****************************************************************************
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       77.43      0.75     0.600    56
  SCHOOL                     B        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) =   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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       10.40      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) =   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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.55      0.75     0.600    56
  MOBILE HOME PARK           B        1.01      0.75     0.250    56
  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) =     287.46
  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  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 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
  "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) =     14.06
  TOTAL AREA(ACRES) =      7.00   PEAK FLOW RATE(CFS) =     14.06

  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      Fp         Ap     SCS
```



```
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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) =   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) =      23.80
  *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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        9.34      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) =     9.34      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<<<<<
============================================================================
```

```
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   18.01
  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
  EFFECTIVE STREAM AREA(ACRES) =      25.49
  TOTAL STREAM AREA(ACRES) =      25.49
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      35.04

****************************************************************************
  FLOW PROCESS FROM NODE  21330.00 TO NODE  21331.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   870.87
  ELEVATION DATA: UPSTREAM(FEET) =   1440.00  DOWNSTREAM(FEET) =   1425.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.920
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.307
  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
  "3-4 DWELLINGS/ACRE"        B        9.67      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) =     16.17
  TOTAL AREA(ACRES) =      9.67   PEAK FLOW RATE(CFS) =     16.17

  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  21331.00 TO NODE  21332.00 IS CODE =  33
----------------------------------------------------------------------------
  >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1425.00
  DOWNSTREAM NODE ELEVATION(FEET) =  1355.00
  FLOW LENGTH(FEET) =  1286.35   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   7.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.23
  PIPE-FLOW(CFS) =      16.17
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   1.60    Tc(MIN.) =  15.52
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.161
  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       22.89      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) =   22.89      SUBAREA RUNOFF(CFS) =   35.28
  EFFECTIVE AREA(ACRES) =     32.56    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) =      50.18

  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) =   0.66
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  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) =   34.01
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.46
    HALFSTREET FLOOD WIDTH(FEET) =   16.63
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.90
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.71
  LONGEST FLOWPATH FROM NODE  21330.00 TO NODE  21332.00 =    2157.22 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21332.00 TO NODE  21332.00 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.) =   15.52
  RAINFALL INTENSITY(INCH/HR) =   2.16
  AREA-AVERAGED Fm(INCH/HR) =  0.45
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.60
  EFFECTIVE STREAM AREA(ACRES) =      32.56
  TOTAL STREAM AREA(ACRES) =      32.56
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      50.18

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       35.04   18.01    1.976  0.75( 0.45) 0.60      25.5   21320.00
      2       50.18   15.52    2.161  0.75( 0.45) 0.60      32.6   21330.00

  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       84.02   15.52    2.161  0.75( 0.45) 0.60      54.5   21330.00
     2       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      Fp         Ap     SCS
       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 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
  "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) =     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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       10.28      0.75     0.600    56
```

```
  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) =      44.57

  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) =      86.61
    ***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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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
```



```
  TOTAL AREA(ACRES) =       66.1        PEAK FLOW RATE(CFS) =     120.32

  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       23.13      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) =   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<<<<<
============================================================================
```

```
  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 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        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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        1.96      0.75     0.700    56
  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 AREA(ACRES) =    2.18      SUBAREA RUNOFF(CFS) =    3.91
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.89      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        6.98      0.75     0.700    56
  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
```

```
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.59      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        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.) =  14.86
  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.) =   14.86
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.218
  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       33.72      0.75     0.600    56
  COMMERCIAL                 B        0.32      0.75     0.100    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        1.48      0.75     0.700    56
  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 =  0.64
  TOTAL 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) =   2.22
  AREA-AVERAGED Fm(INCH/HR) =  0.48
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.64
  EFFECTIVE 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
      2       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)     Ap     Ae     HEADWATER
```

```
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      242.98   13.24    2.377  0.75( 0.48) 0.64     142.4   21340.00
    2      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      Fp         Ap     SCS
       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) =   11.39
  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 **
```



```
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      242.98   14.11    2.288  0.75( 0.48) 0.64     149.2   21340.00
    2      233.09   15.74    2.142  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 **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      103.30   16.20    2.106  0.75( 0.45) 0.60      69.3   21330.00
    2       97.16   18.71    1.932  0.75( 0.45) 0.60      72.8   21320.00
  LONGEST FLOWPATH FROM NODE  21320.00 TO NODE  21355.00 =    3805.88 FEET.

  ** PEAK FLOW RATE TABLE **
 STREAM       Q      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
    2      335.68   15.74    2.142  0.75( 0.47) 0.63     223.1   21350.00
    3      331.26   16.20    2.106  0.75( 0.47) 0.63     225.0   21330.00
    4      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.) =   14.111
  EFFECTIVE AREA(ACRES) =    209.56  AREA-AVERAGED Fm(INCH/HR) =  0.47
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.63
  TOTAL 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 =  0.013

  USER 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<<<<<
============================================================================
```

```
  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         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   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
      2      335.68   17.32    2.023  0.75( 0.47) 0.63     227.5   21350.00
      3      331.26   17.78    1.991  0.75( 0.47) 0.63     229.5   21330.00
      4      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      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) =   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) =     381.69

  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
      2      372.37   18.22    1.963  0.75( 0.47) 0.62     265.8   21350.00
      3      367.46   18.69    1.933  0.75( 0.47) 0.62     267.8   21330.00
      4      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) =     252.30

****************************************************************************
  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      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        B        7.40      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) =    7.40      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
```

```
****************************************************************************
  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) =     381.69
  FLOW VELOCITY(FEET/SEC.) =  10.96   FLOW DEPTH(FEET) =   2.63
  TRAVEL TIME(MIN.) =   0.87   Tc(MIN.) =   17.44
  LONGEST FLOWPATH FROM NODE  21340.00 TO NODE  21359.00 =    7654.50 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   17.44    2.015  0.75( 0.47) 0.62     259.7   21340.00
      2      372.37   19.10    1.908  0.75( 0.47) 0.62     273.2   21350.00
      3      367.46   19.57    1.880  0.75( 0.47) 0.62     275.2   21330.00
      4      334.87   22.16    1.745  0.75( 0.47) 0.62     278.7   21320.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     381.69  Tc(MIN.) =   17.44
  AREA-AVERAGED Fm(INCH/HR) =  0.47  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.62  EFFECTIVE AREA(ACRES) =     259.70

****************************************************************************
  FLOW PROCESS FROM NODE  21359.00 TO NODE  21359.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   17.44
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.015
  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        4.95      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) =   10.75
  EFFECTIVE AREA(ACRES) =    266.81   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) =     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

****************************************************************************
  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  41.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.10
  PIPE-FLOW(CFS) =     381.69
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   0.56    Tc(MIN.) =  18.00
  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.) =   18.00
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.977
  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        3.67      0.75     0.600    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) =    6.55
  EFFECTIVE AREA(ACRES) =    271.41   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) =     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

****************************************************************************
  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
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      381.69   18.04    1.974  0.75( 0.46) 0.62     271.4   21340.00
      2      372.37   19.70    1.873  0.75( 0.46) 0.62     284.9   21350.00
      3      367.46   20.17    1.846  0.75( 0.46) 0.62     286.9   21330.00
      4      334.87   22.78    1.717  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
      1      287.46   22.76    1.717  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 **
  STREAM        Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
     1       656.09   18.04    1.974  0.75( 0.46) 0.62      471.1   21340.00
     2       651.92   19.70    1.873  0.75( 0.46) 0.62      502.9   21350.00
     3       648.36   20.17    1.846  0.75( 0.46) 0.62      510.2   21330.00
     4       622.54   22.76    1.717  0.75( 0.46) 0.62      542.3   21300.00
     5       622.15   22.78    1.717  0.75( 0.46) 0.62      542.3   21320.00
   TOTAL AREA(ACRES) =       542.3

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      656.09  Tc(MIN.) =   18.040
 EFFECTIVE AREA(ACRES) =    471.08  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) =     656.09
 FLOW VELOCITY(FEET/SEC.) =  10.42   FLOW DEPTH(FEET) =   3.36
 TRAVEL TIME(MIN.) =   1.23   Tc(MIN.) =   19.27
 LONGEST FLOWPATH FROM NODE  21300.00 TO NODE  21361.00 =   11092.76 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM        Q      Tc   Intensity   Fp(Fm)      Ap      Ae      HEADWATER
  NUMBER      (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
     1       656.09   19.27    1.898  0.75( 0.46) 0.62      471.1   21340.00
     2       651.92   20.93    1.806  0.75( 0.46) 0.62      502.9   21350.00
     3       648.36   21.41    1.781  0.75( 0.46) 0.62      510.2   21330.00
     4       622.54   24.01    1.663  0.75( 0.46) 0.62      542.3   21300.00
     5       622.15   24.03    1.662  0.75( 0.46) 0.62      542.3   21320.00
 NEW PEAK FLOW DATA ARE:
 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  21361.00 TO NODE  21361.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   19.27
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.898
```



```
 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       11.84      0.75      0.600    56
 MOBILE HOME PARK           B        3.43      0.75      0.250    56
 COMMERCIAL                 B        1.54      0.75      0.100    56
 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) =   23.25
 EFFECTIVE AREA(ACRES) =    487.89   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) =     656.09
 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  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) =     1253.07    Tc(MIN.) =   31.77
 AREA-AVERAGED Fm(INCH/HR) =  0.46    Ybar = 0.54
 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) =     1253.07    Tc(MIN.) =   31.77
 AREA-AVERAGED Fm(INCH/HR) =  0.46    Ybar = 0.54
 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) =    1253.07
  FLOW VELOCITY(FEET/SEC.) =  26.29   FLOW DEPTH(FEET) =   3.13
  TRAVEL TIME(MIN.) =   0.96   Tc(MIN.) =   32.73
  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.) =   32.73
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.381
  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       42.57      0.75     0.600    56
  MOBILE HOME PARK           B       41.35      0.75     0.250    56
  COMMERCIAL                 B       17.40      0.75     0.100    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        0.33      0.63     1.000    65
  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= 0.36;30M= 0.74;1H= 0.97;3H= 1.57;6H= 2.14;24H= 4.29
  S-GRAPH: VALLEY(DEV.)= 94.5%;VALLEY(UNDEV.)/DESERT=  5.5%
           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 = 0.94; 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.
   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) =     262.45
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    1331.80
  TOTAL AREA(ACRES) =     1442.0       PEAK FLOW RATE(CFS) =    1331.80

  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  21361.00 TO NODE  21361.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  PEAK FLOW RATE(CFS) =     1331.80    Tc(MIN.) =   32.73
  AREA-AVERAGED Fm(INCH/HR) =  0.45    Ybar = 0.53
```



```
  TOTAL AREA(ACRES) =     1442.0
  LONGEST FLOWPATH FROM NODE  21100.00 TO NODE  21361.00 =   17083.18 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      656.09   19.27    1.898  0.75( 0.46) 0.61     487.9   21340.00
      2      651.92   20.93    1.806  0.75( 0.46) 0.61     519.7   21350.00
      3      648.36   21.41    1.781  0.75( 0.46) 0.61     527.0   21330.00
      4      622.54   24.01    1.663  0.75( 0.46) 0.61     559.1   21300.00
      5      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= 1.00
  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=.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.) =   33.79
  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 =  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):
```

```
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        4.75      0.75      0.600    56
 COMMERCIAL                 B       11.57      0.75      0.100    56
 MOBILE HOME PARK           B       12.66      0.75      0.250    56
 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= 0.36;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%
          MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
 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.
 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=.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) =     359.85
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    1774.77
 TOTAL AREA(ACRES) =     2030.2       PEAK FLOW RATE(CFS) =    1783.37
 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  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) =    1783.37    Tc(MIN.) =   33.79
 AREA-AVERAGED Fm(INCH/HR) =  0.45   Ybar = 0.53
 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
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.311
 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
 "3-4 DWELLINGS/ACRE"       B        3.63      0.75      0.600    56   10.33
 COMMERCIAL                 B        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) =     20.04
 TOTAL AREA(ACRES) =      7.30   PEAK FLOW RATE(CFS) =     20.04

 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  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) =      26.28
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.50
  HALFSTREET FLOOD WIDTH(FEET) =   18.13
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.60
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.81
 STREET FLOW TRAVEL TIME(MIN.) =   2.79   Tc(MIN.) =   10.41
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.745
 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        5.99      0.75      0.600    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 =  0.599
 SUBAREA AREA(ACRES) =    6.00      SUBAREA RUNOFF(CFS) =   12.40
 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) =      28.73

 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) = 0.51   HALFSTREET FLOOD WIDTH(FEET) =  18.68
 FLOW VELOCITY(FEET/SEC.) =  3.72   DEPTH*VELOCITY(FT*FT/SEC.) =   1.91
 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  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      Fp         Ap     SCS
       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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.94      0.75     0.600    56
  COMMERCIAL                 B        0.17      0.75     0.100    56
  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 Tc :
  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
```

```
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       10.88      0.75     0.600    56
  COMMERCIAL                 B       14.84      0.75     0.100    56
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       33.59      0.75     0.600    56
```



```
  MOBILE HOME PARK           B        3.65      0.75     0.250    56
  COMMERCIAL                 B        1.26      0.75     0.100    56
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B       12.70      0.75     0.250    56
  RESIDENTIAL
  "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) =   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)<<
```

```
==============================================================================
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1      1783.37   33.79     2030.17    21100.00
     2       207.89   15.21      123.46    21370.00
```



```
  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.
   EQUIVALENT 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)
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             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
  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)
===  =====  =========  =================  ======  ===== ====== ===== =======
  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  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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.742
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.314
  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
  "3-4 DWELLINGS/ACRE"       B        8.19      0.75      0.600    56   10.49
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        0.62      0.75      0.700    56   11.15
  COMMERCIAL                 B        0.44      0.75      0.100    56    7.74
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.583
  SUBAREA RUNOFF(CFS) =     23.96
  TOTAL AREA(ACRES) =      9.25   PEAK FLOW RATE(CFS) =     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
```

```
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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) =      28.35

  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) =      28.35
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        3.90      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) =    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) =      34.66
  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      Fp         Ap     SCS
       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
```

```
  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
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       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) =    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       26.61      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) =   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
  PIPE-FLOW(CFS) =      88.24
  *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     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        1.06      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        5.55      0.75     0.600    56
  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) =   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
```

```
  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 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
  "3-4 DWELLINGS/ACRE"       B        3.87      0.75     0.600    56   11.68
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        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      Fp         Ap     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 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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.80      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) =    1.80      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
```

```
  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      Fp         Ap     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) =      25.20
  *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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        0.54      0.75     0.250    56
  PUBLIC PARK                B        1.31      0.75     0.850    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.69      0.75     0.600    56
  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       PEAK FLOW RATE(CFS) =      27.95

  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        2.38      0.75     0.250    56
  PUBLIC PARK                B        2.15      0.75     0.850    56
  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
```

```
  USER SPECIFIED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  12.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.20
  PIPE-FLOW(CFS) =      32.93
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   0.49    Tc(MIN.) =  22.16
  LONGEST FLOWPATH FROM NODE  21410.00 TO NODE  21417.00 =    3166.72 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21417.00 TO NODE  21417.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   22.16
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.763
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        0.24      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.73      0.75     0.600    56
  MOBILE HOME PARK           B        0.34      0.75     0.250    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.418
  SUBAREA AREA(ACRES) =    1.31      SUBAREA RUNOFF(CFS) =    1.71
  EFFECTIVE AREA(ACRES) =     28.62   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) =      34.05

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87

****************************************************************************
  FLOW PROCESS FROM NODE  21417.00 TO NODE  21417.00 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.) =   22.16
  RAINFALL INTENSITY(INCH/HR) =   1.76
  AREA-AVERAGED Fm(INCH/HR) =  0.44
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.59
  EFFECTIVE STREAM AREA(ACRES) =      28.62
  TOTAL STREAM AREA(ACRES) =      28.62
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      34.05

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   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
      2       34.05   22.16    1.763  0.75( 0.44) 0.59      28.6   21410.00

  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      146.53   16.45    2.109  0.75( 0.41) 0.54      95.7   21400.00
      2      125.57   22.16    1.763  0.75( 0.41) 0.55     103.1   21410.00

  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
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.54
  TOTAL AREA(ACRES) =      103.1
  LONGEST FLOWPATH FROM NODE  21400.00 TO NODE  21417.00 =    3607.36 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21417.00 TO NODE  21418.00 IS CODE =  42
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1250.00
  DOWNSTREAM NODE ELEVATION(FEET) =  1218.00
  FLOW LENGTH(FEET) =  2374.87   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  32.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.15
  PIPE-FLOW(CFS) =     146.53
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   2.61    Tc(MIN.) =  19.06
  LONGEST FLOWPATH FROM NODE  21400.00 TO NODE  21418.00 =    5982.23 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21418.00 TO NODE  21418.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   19.06
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.930
  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        3.88      0.75     0.600    56
  COMMERCIAL                 B        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) =   67.13
  EFFECTIVE AREA(ACRES) =    138.43   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) =     198.29

  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  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) =     1880.76    Tc(MIN.) =   33.79
  AREA-AVERAGED Fm(INCH/HR) =  0.44    Ybar = 0.52
  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) =     1880.76    Tc(MIN.) =   33.79
  AREA-AVERAGED Fm(INCH/HR) =  0.44    Ybar = 0.52
  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<<<<<
  >>>>>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) =    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.

******************************************************************************
  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
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.347
  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        7.20      0.75      0.600    56
  COMMERCIAL                 B       26.95      0.75      0.100    56
  MOBILE HOME PARK           B       13.18      0.75      0.250    56
  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= 0.36;30M= 0.74;1H= 0.97;3H= 1.56;6H= 2.10;24H= 4.18
  S-GRAPH: VALLEY(DEV.)= 96.4%;VALLEY(UNDEV.)/DESERT=  3.6%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  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.
  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.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   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
  TOTAL AREA(ACRES) =     2201.0       PEAK FLOW RATE(CFS) =    1887.01

  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  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) =     1887.01    Tc(MIN.) =   34.70
  AREA-AVERAGED Fm(INCH/HR) =  0.44    Ybar = 0.52
  TOTAL AREA(ACRES) =     2201.0
  LONGEST FLOWPATH FROM NODE  21100.00 TO NODE  21418.00 =   19307.12 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      196.96   19.24    1.920  0.75( 0.34) 0.45     138.4   21400.00
      2      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:
  UNIT-HYDROGRAPH DATA:
  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;
  3HR = 0.98; 6HR = 0.99; 24HR= 1.00
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =     2346.8
  LONGEST FLOWPATH FROM NODE  21100.00 TO NODE  21418.00 =   19307.12 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
```

```
 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B       13.22      0.75     0.600    56
 COMMERCIAL                 B       80.88      0.75     0.100    56
 MOBILE HOME PARK           B       29.32      0.75     0.250    56
 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
```



```
 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  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):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B       73.53      0.75     0.100    56
 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                B       28.10      0.75     0.850    56
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"      B       24.44      0.75     0.400    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 =  0.365
 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
```

```
****************************************************************************
  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
  *GIVEN BOX HEIGHT(FEET) =   5.00   ESTIMATED BOX BASEWIDTH(FEET) =   24.00
  ASSUME FULL-FLOWING BOX   BOX-FLOW VELOCITY(FEET/SEC.) =  17.82
  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  21421.00 TO NODE  21421.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   40.33
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.231
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK                B        0.85      0.75     0.850    56
  COMMERCIAL                 B        0.87      0.75     0.100    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 =  0.482
  SUBAREA AREA(ACRES) =    1.89
  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) = 0.67; LAG(HR) = 0.54; 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) =     2706.4
  LONGEST FLOWPATH FROM NODE  21100.00 TO NODE  21421.00 =   25167.53 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) = 16.58  RUNOFF VOLUME(AF) =     508.12
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    2113.99
  TOTAL AREA(ACRES) =     2706.4       PEAK FLOW RATE(CFS) =    2138.18
  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  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) =     4925.57    Tc(MIN.) =   57.43
  AREA-AVERAGED Fm(INCH/HR) =  0.50    Ybar = 0.53
  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) =     4925.57    Tc(MIN.) =   57.43
  AREA-AVERAGED Fm(INCH/HR) =  0.50    Ybar = 0.53
  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) =    4925.57
  FLOW VELOCITY(FEET/SEC.) =  27.86   FLOW DEPTH(FEET) =   5.65
  TRAVEL TIME(MIN.) =   1.12   Tc(MIN.) =   58.55
  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.) =   58.55
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  0.984
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       51.49      0.75     0.100    56
  RESIDENTIAL
```

```
"3-4 DWELLINGS/ACRE"       B        5.09      0.75     0.600    56
PUBLIC PARK                B        3.37      0.75     0.850    56
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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       65.40      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.90      0.75     0.600    56
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        4.85      0.75     0.200    56
  PUBLIC PARK                B        2.00      0.75     0.850    56
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B       47.14      0.75     0.400    56
  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.
   EQUIVALENT 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
```

```
  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      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.99      0.75     0.600    56
  COMMERCIAL                 B       11.78      0.75     0.100    56
  MOBILE HOME PARK           B        4.78      0.75     0.250    56
  PUBLIC PARK                B        1.74      0.75     0.850    56
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        0.99      0.75     0.200    56
  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.
   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) = 16.83  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      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.52      0.75     0.600    56
  PUBLIC PARK                B        1.21      0.75     0.850    56
  MOBILE HOME PARK           B        4.21      0.75     0.250    56
  SCHOOL                     B        0.18      0.75     0.600    56
  COMMERCIAL                 B        0.96      0.75     0.100    56
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        0.39      0.75     0.200    56
  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.
   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
  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
```

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------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  PEAK FLOW RATE(CFS) =    5859.56    Tc(MIN.) =   60.20
  AREA-AVERAGED Fm(INCH/HR) =  0.47   Ybar = 0.52
  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
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.255
  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
  "5-7 DWELLINGS/ACRE"       B        0.20      0.75     0.500    56    6.53
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.38      0.75     0.600    56    6.92
  COMMERCIAL                 B        3.33      0.75     0.100    56    5.10
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.315
  SUBAREA RUNOFF(CFS) =     21.38
  TOTAL AREA(ACRES) =      5.91   PEAK FLOW RATE(CFS) =     21.38

  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  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) =      32.41
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    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.56
    HALFSTREET FLOOD WIDTH(FEET) =   20.21
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.79
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.13
  STREET FLOW TRAVEL TIME(MIN.) =   1.26   Tc(MIN.) =    6.36
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.729
  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        0.32      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    56
  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) =   22.04
  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) =      40.62

  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) = 0.60   HALFSTREET FLOOD WIDTH(FEET) =  22.09
  FLOW VELOCITY(FEET/SEC.) =  4.01   DEPTH*VELOCITY(FT*FT/SEC.) =   2.40
  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) =      50.46
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.68
    HALFSTREET FLOOD WIDTH(FEET) =   26.41
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.65
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.47
  STREET FLOW TRAVEL TIME(MIN.) =   1.16   Tc(MIN.) =    7.52
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.372
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  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

  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   HALFSTREET FLOOD WIDTH(FEET) =  28.59
  FLOW VELOCITY(FEET/SEC.) =  3.74   DEPTH*VELOCITY(FT*FT/SEC.) =   2.62
  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) =      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
  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
  COMMERCIAL                 B        8.62      0.75     0.100    56
  RESIDENTIAL
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  "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.

****************************************************************************
  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) =      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
  *  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
  "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
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.19
  TOTAL AREA(ACRES) =       48.7        PEAK FLOW RATE(CFS) =     108.45
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  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
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.44      0.75     0.600    56
  COMMERCIAL                 B       28.76      0.75     0.100    56
  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
```



```
  END OF SUBAREA STREET FLOW HYDRAULICS:
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       22.52      0.75     0.100    56
  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
```

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 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  34.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  16.73
 PIPE-FLOW(CFS) =     198.05
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME(MIN.) =   1.13    Tc(MIN.) =  16.57
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.099
 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"                 B        0.28      0.63     1.000    65
 COMMERCIAL                 B       35.84      0.75     0.100    56
 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) =   73.25
 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) =     262.60

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.36; 30M = 0.74; 1HR = 0.97; 3HR = 1.53; 6HR = 2.04; 24HR = 3.87

 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) =   64.55
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.71
   HALFSTREET FLOOD WIDTH(FEET) =   29.69
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.12
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.92
 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
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----------------------------------------------------------------------------
 >>>>>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
 DEPTH OF FLOW IN  60.0 INCH PIPE IS  40.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  18.46
 PIPE-FLOW(CFS) =     262.60
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME(MIN.) =   0.87    Tc(MIN.) =  17.43
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.036
 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"                 B        0.33      0.63     1.000    65
 COMMERCIAL                 B       21.36      0.75     0.100    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        3.94      0.75     0.600    56
 MOBILE HOME PARK           B        2.98      0.75     0.250    56
 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) =   48.71
 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) =     302.90

 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) =   40.31
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.61
   HALFSTREET FLOOD WIDTH(FEET) =   22.48
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.84
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.34
 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.) =   17.43
  RAINFALL INTENSITY(INCH/HR) =   2.04
  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 =     302.90
  ** CONFLUENCE DATA **
  STREAM      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1      5859.56   60.20    13940.30    20120.00
     2       302.90   17.43      176.56    21430.00

  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.)= 77.3%;VALLEY(UNDEV.)/DESERT= 22.7%
           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) =    14116.9
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21439.00 =   52041.07 FEET.
   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
  TIME OF PEAK FLOW(HR) = 16.83  RUNOFF VOLUME(AF) =    2886.05
  PEAK FLOW RATE(CFS) =    5890.18

****************************************************************************
  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) =    5890.18
  FLOW VELOCITY(FEET/SEC.) =  21.45   FLOW DEPTH(FEET) =   7.74
  TRAVEL TIME(MIN.) =   1.14   Tc(MIN.) =   61.34
  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) =    5890.18    Tc(MIN.) =   61.34
  AREA-AVERAGED Fm(INCH/HR) =  0.47   Ybar = 0.52
  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
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.530
  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.)
  MOBILE HOME PARK            B        6.41      0.75      0.250    56   12.59
  PUBLIC PARK                 B        0.38      0.75      0.850    56   18.09
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        B        0.07      0.75      0.600    56   15.43
  SCHOOL                      B        0.09      0.75      0.600    56   15.43
  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) =     15.00
  TOTAL AREA(ACRES) =      7.20   PEAK FLOW RATE(CFS) =     15.00

  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  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) =     29.58
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.66
    HALFSTREET FLOOD WIDTH(FEET) =   26.07
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.07
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.37
```

```
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK                B        1.22      0.75     0.850    56
  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) =      40.59

  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
```



```
  EFFECTIVE STREAM AREA(ACRES) =      25.13
  TOTAL STREAM AREA(ACRES) =      25.13
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      40.59
  ** CONFLUENCE DATA **
  STREAM      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1      5890.18   61.34    14116.86    20120.00
     2        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 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.)
  MOBILE HOME PARK           B        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) =      6.93

  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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.02      0.75     0.900    56
  MOBILE HOME PARK           B       18.33      0.75     0.250    56
  PUBLIC PARK                B        0.30      0.75     0.850    56
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        0.28      0.75     0.200    56
  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
```



```
  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
  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      Fp         Ap     SCS
       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
```

```
  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 =      40.57
  ** CONFLUENCE DATA **
  STREAM      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1      5890.18   62.29    14141.99    20120.00
     2        40.57   15.31       22.00    21450.00

  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) = 1.04; LAG(HR) = 0.83; 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) =    14164.0
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21453.00 =   55081.64 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) = 16.83  RUNOFF VOLUME(AF) =    2897.15
  PEAK FLOW RATE(CFS) =    5719.87
    (UPSTREAM NODE PEAK FLOW RATE(CFS) =    5890.18)
  PEAK FLOW RATE(CFS) USED =    5890.18

****************************************************************************
  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) =    5890.18
  FLOW VELOCITY(FEET/SEC.) =  14.60   FLOW DEPTH(FEET) =   9.73
  TRAVEL TIME(MIN.) =   0.59   Tc(MIN.) =   62.89
  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) =    5890.18    Tc(MIN.) =   62.89
  AREA-AVERAGED Fm(INCH/HR) =  0.47   Ybar = 0.52
  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
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.596
  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
  "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
  COMMERCIAL                 B        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) =     20.22
  TOTAL AREA(ACRES) =      9.99   PEAK FLOW RATE(CFS) =     20.22

  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  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

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      25.78
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.57
    HALFSTREET FLOOD WIDTH(FEET) =   21.37
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.61
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.48
  STREET FLOW TRAVEL TIME(MIN.) =   3.05   Tc(MIN.) =   14.69
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.257
  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        6.45      0.75     0.500    56
  COMMERCIAL                 B        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      Fp         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"       B        8.08      0.75     0.500    56
  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

****************************************************************************
```



```
  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) =      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    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) =   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) =      51.06
  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
```

```
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        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) =   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) =      60.82
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        0.26      0.75     0.100    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        8.00      0.75     0.500    56
  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
  TOTAL AREA(ACRES) =       47.8       PEAK FLOW RATE(CFS) =      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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        7.62      0.75     0.500    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        1.76      0.63     1.000    65
  COMMERCIAL                 B        2.13      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        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) =   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
----------------------------------------------------------------------------
```

```
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
  MAINLINE Tc(MIN.) =   22.33
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.755
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B        0.73      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        B        0.64      0.75     0.600    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"        B       11.78      0.75     0.500    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                  B        2.68      0.63     1.000    65
  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) =   19.21
  EFFECTIVE AREA(ACRES) =     75.25   AREA-AVERAGED Fm(INCH/HR) =  0.37
  AREA-AVERAGED Fp(INCH/HR) =  0.73  AREA-AVERAGED Ap =  0.51
  TOTAL AREA(ACRES) =       75.2       PEAK FLOW RATE(CFS) =      93.55

  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  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) =      93.55
  FLOW VELOCITY(FEET/SEC.) =  10.51   FLOW DEPTH(FEET) =   1.67
  TRAVEL TIME(MIN.) =   5.07   Tc(MIN.) =   27.40
  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.) =   27.40
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.552
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B        8.14      0.75     0.100    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                  B        7.28      0.63     1.000    65
  PUBLIC PARK                 B        6.06      0.75     0.850    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"        B        3.35      0.75     0.500    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        B        0.97      0.75     0.600    56
  RESIDENTIAL
```



```
  ".4 DWELLING/ACRE"          B        0.23      0.75     0.900    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 **
  STREAM      Q        Tc      AREA      HEADWATER
  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
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B       17.62      0.75     0.500    56
  COMMERCIAL                 B        0.37      0.75     0.100    56
  PUBLIC PARK                B        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.
   EQUIVALENT 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:
  TOTAL AREA(ACRES)     =    14283.6  TC(MIN.) =     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
```

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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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                          Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* 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-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  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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.474
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.233
  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        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 DWELLINGS/ACRE"         B        2.55      0.75     0.700    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) =      9.44

  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  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
```

```
  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) =      14.51
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.29
    HALFSTREET FLOOD WIDTH(FEET) =    8.04
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    9.49
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.72
  STREET FLOW TRAVEL TIME(MIN.) =   0.24   Tc(MIN.) =    6.72
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.162
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     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
  "OPEN BRUSH"                B        0.90      0.61     1.000    66
  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) =   10.14
  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) =      19.33

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.31   HALFSTREET FLOOD WIDTH(FEET) =   9.13
  FLOW VELOCITY(FEET/SEC.) = 10.15   DEPTH*VELOCITY(FT*FT/SEC.) =   3.14
  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

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



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  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      26.52
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.41
    HALFSTREET FLOOD WIDTH(FEET) =   14.37
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.08
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.51
  STREET FLOW TRAVEL TIME(MIN.) =   0.79   Tc(MIN.) =    7.51
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.959
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"                A        1.17      0.86     1.000    46
  NATURAL FAIR COVER
  "OPEN BRUSH"                B        2.63      0.61     1.000    66
  RESIDENTIAL
  "2 DWELLINGS/ACRE"          B        3.01      0.75     0.700    56
  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) =   14.36
  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) =      32.17

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.44   HALFSTREET FLOOD WIDTH(FEET) =  15.54
  FLOW VELOCITY(FEET/SEC.) =  6.35   DEPTH*VELOCITY(FT*FT/SEC.) =   2.78
  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
  Manning's FRICTION FACTOR for Streetflow Section(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
```

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  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      60.08
  ***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.) =    6.43
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.57
 STREET FLOW TRAVEL TIME(MIN.) =   0.65   Tc(MIN.) =    8.15
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.815
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL FAIR COVER
 "OPEN BRUSH"               A        1.82      0.86     1.000    46
 NATURAL FAIR COVER
 "OPEN BRUSH"               B       19.46      0.61     1.000    66
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        6.79      0.75     0.700    56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         A        0.01      0.98     0.700    32
 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) =   55.78
 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) =      86.01

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.61   HALFSTREET FLOOD WIDTH(FEET) =  23.69
 FLOW VELOCITY(FEET/SEC.) =  7.19   DEPTH*VELOCITY(FT*FT/SEC.) =   4.42
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  249.7 FT WITH ELEVATION-DROP =  10.0 FT, IS   58.9 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
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(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) = 18.00

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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
```



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  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     134.10
  ***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.) =    9.04
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.07
 STREET FLOW TRAVEL TIME(MIN.) =   1.38   Tc(MIN.) =    9.53
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.563
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL FAIR COVER
 "OPEN BRUSH"               A        5.68      0.86     1.000    46
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         A        3.92      0.98     0.700    32
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        6.10      0.75     0.700    56
 NATURAL FAIR COVER
 "OPEN BRUSH"               B       39.60      0.61     1.000    66
 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) =   96.02
 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) =     172.24

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.72   HALFSTREET FLOOD WIDTH(FEET) =  29.24
 FLOW VELOCITY(FEET/SEC.) =  9.66   DEPTH*VELOCITY(FT*FT/SEC.) =   7.00

 *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) =  24.00    NUMBER OF PIPES =   1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) =  15.34
 PIPE-FLOW(CFS) =      48.24
 PIPEFLOW TRAVEL TIME(MIN.) =   0.81    Tc(MIN.) =   8.96
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.659
 SUBAREA AREA(ACRES) =   55.30      SUBAREA RUNOFF(CFS) =  100.80
 TOTAL AREA(ACRES) =       98.5        PEAK FLOW RATE(CFS) =     180.74

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.31; 30M = 0.64; 1HR = 0.85; 3HR = 1.57; 6HR = 2.39; 24HR = 4.88
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =  132.51
  ***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.) =    9.01
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.02
```

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 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) =     180.74
 FLOW VELOCITY(FEET/SEC.) =   9.30   FLOW DEPTH(FEET) =   2.11
 TRAVEL TIME(MIN.) =   2.22   Tc(MIN.) =   11.18
 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.) =   11.18
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.329
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL FAIR COVER
 "OPEN BRUSH"               A        2.42      0.86     1.000    46
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         A        7.44      0.98     0.700    32
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B       21.25      0.75     0.700    56
 NATURAL FAIR COVER
 "OPEN BRUSH"               B      127.72      0.61     1.000    66
 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) =  245.88
 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) =     397.33

 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  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) =     397.33
 FLOW VELOCITY(FEET/SEC.) =   9.81   FLOW DEPTH(FEET) =   1.25
 TRAVEL TIME(MIN.) =   2.26   Tc(MIN.) =   13.44
```



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 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.) =   13.44
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.085
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL FAIR COVER
 "OPEN BRUSH"               A        2.55      0.86     1.000    46
 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"               B       66.90      0.61     1.000    66
 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) =  121.88
 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) =     462.81

 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  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) =     462.81
 FLOW VELOCITY(FEET/SEC.) =   9.80   FLOW DEPTH(FEET) =   1.44
 TRAVEL TIME(MIN.) =   3.40   Tc(MIN.) =   16.84
 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.) =   16.84
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.822
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL FAIR COVER
 "OPEN BRUSH"               A        3.92      0.86     1.000    46
 RESIDENTIAL
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  "2 DWELLINGS/ACRE"          A        0.86      0.98     0.700    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        A       16.85      0.98     0.600    32
  MOBILE HOME PARK            B       25.39      0.75     0.250    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        B       10.75      0.75     0.600    56
  NATURAL FAIR COVER
  "OPEN BRUSH"                B       87.64      0.61     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.67
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.791
  SUBAREA AREA(ACRES) =  145.41      SUBAREA RUNOFF(CFS) =  168.94
  EFFECTIVE AREA(ACRES) =    495.13   AREA-AVERAGED Fm(INCH/HR) =  0.59
  AREA-AVERAGED Fp(INCH/HR) =  0.66  AREA-AVERAGED Ap =  0.89
  TOTAL AREA(ACRES) =      495.1       PEAK FLOW RATE(CFS) =     548.79

  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  20108.00 TO NODE  20109.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2095.00  DOWNSTREAM(FEET) =   2020.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2023.91   CHANNEL SLOPE =  0.0371
  CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =  10.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     548.79
  FLOW VELOCITY(FEET/SEC.) =   9.50   FLOW DEPTH(FEET) =   1.35
  TRAVEL TIME(MIN.) =   3.55   Tc(MIN.) =   20.39
  LONGEST FLOWPATH FROM NODE  20100.00 TO NODE  20109.00 =    8231.30 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20109.00 TO NODE  20109.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   20.39
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.624
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"                A        2.81      0.86     1.000    46
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        A       27.06      0.98     0.600    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        B       26.94      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"          B       35.77      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"                B      102.40      0.61     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.69
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.834
  SUBAREA AREA(ACRES) =  194.98      SUBAREA RUNOFF(CFS) =  184.26
  EFFECTIVE AREA(ACRES) =    690.11   AREA-AVERAGED Fm(INCH/HR) =  0.59
  AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap =  0.88
```



```
  TOTAL AREA(ACRES) =      690.1       PEAK FLOW RATE(CFS) =     644.98

  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  20109.00 TO NODE  20109.00 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.)= 32.0%;VALLEY(UNDEV.)/DESERT= 68.0%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.34; LAG(HR) = 0.27; Fm(INCH/HR) = 0.59; 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) =  2.50   TOTAL AREA(ACRES) =      690.1
  LONGEST FLOWPATH FROM NODE  20100.00 TO NODE  20109.00 =    8231.30 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0363; Lca/L=0.4,n=.0325; Lca/L=0.5,n=.0299;Lca/L=0.6,n=.0279
  TIME OF PEAK FLOW(HR) = 16.33  RUNOFF VOLUME(AF) =     114.94
  UNIT-HYDROGRAPH METHOD PEAK FLOW RATE(CFS) =    639.40
  TOTAL PEAK FLOW RATE(CFS) =    639.40 (SOURCE FLOW INCLUDED)
  RATIONAL METHOD PEAK FLOW RATE(CFS) =    644.98
   (UPSTREAM NODE PEAK FLOW RATE(CFS) =    644.98)
  PEAK FLOW RATE(CFS) USED =    644.98

****************************************************************************
  FLOW PROCESS FROM NODE  20109.00 TO NODE  20110.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2020.00  DOWNSTREAM(FEET) =   1960.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1927.24   CHANNEL SLOPE =  0.0311
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   5.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     644.98
  FLOW VELOCITY(FEET/SEC.) =  22.79   FLOW DEPTH(FEET) =   2.02
  TRAVEL TIME(MIN.) =   1.41   Tc(MIN.) =   21.80
  LONGEST FLOWPATH FROM NODE  20100.00 TO NODE  20110.00 =   10158.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20110.00 TO NODE  20110.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   21.80
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.560
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"                A        5.83      0.86     1.000    46
  RESIDENTIAL
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  "3-4 DWELLINGS/ACRE"       A       33.80      0.98     0.600    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       25.19      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        9.84      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       45.99      0.61     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.780
  SUBAREA AREA(ACRES) =  120.65
  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.)= 35.7%;VALLEY(UNDEV.)/DESERT= 64.3%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.36; LAG(HR) = 0.29; Fm(INCH/HR) = 0.58; 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) =  2.50   TOTAL AREA(ACRES) =      810.8
  LONGEST FLOWPATH FROM NODE  20100.00 TO NODE  20110.00 =   10158.54 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0327; Lca/L=0.4,n=.0293; Lca/L=0.5,n=.0269;Lca/L=0.6,n=.0251
  TIME OF PEAK FLOW(HR) = 16.33  RUNOFF VOLUME(AF) =     135.96
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =     708.25
  TOTAL AREA(ACRES) =      810.8       PEAK FLOW RATE(CFS) =     708.25

  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  20110.00 TO NODE  20111.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1960.00  DOWNSTREAM(FEET) =   1920.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   928.33   CHANNEL SLOPE =  0.0431
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   5.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     708.25
  FLOW VELOCITY(FEET/SEC.) =  26.26   FLOW DEPTH(FEET) =   1.94
  TRAVEL TIME(MIN.) =   0.59   Tc(MIN.) =   22.39
  LONGEST FLOWPATH FROM NODE  20100.00 TO NODE  20111.00 =   11086.87 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20111.00 TO NODE  20111.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   22.39
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.536
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               A       28.59      0.86     1.000    46
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A       31.08      0.98     0.600    32
```



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  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       31.56      0.75     0.600    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       41.72      0.61     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        5.26      0.75     0.900    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.76
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.815
  SUBAREA AREA(ACRES) =  138.21
  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.)= 37.1%;VALLEY(UNDEV.)/DESERT= 62.9%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.37; LAG(HR) = 0.30; Fm(INCH/HR) = 0.59; 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) =  2.50   TOTAL AREA(ACRES) =      949.0
  LONGEST FLOWPATH FROM NODE  20100.00 TO NODE  20111.00 =   11086.87 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0314; Lca/L=0.4,n=.0281; Lca/L=0.5,n=.0259;Lca/L=0.6,n=.0241
  TIME OF PEAK FLOW(HR) = 16.33  RUNOFF VOLUME(AF) =     158.42
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =     804.42
  TOTAL AREA(ACRES) =      949.0       PEAK FLOW RATE(CFS) =     804.42

  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  20111.00 TO NODE  20112.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1920.00  DOWNSTREAM(FEET) =   1870.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1664.97   CHANNEL SLOPE =  0.0300
  CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   5.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     804.42
  FLOW VELOCITY(FEET/SEC.) =  23.96   FLOW DEPTH(FEET) =   2.30
  TRAVEL TIME(MIN.) =   1.16   Tc(MIN.) =   23.55
  LONGEST FLOWPATH FROM NODE  20100.00 TO NODE  20112.00 =   12751.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20112.00 TO NODE  20112.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   23.55
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.490
  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        8.51      0.98     0.600    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.54      0.75     0.600    56
  RESIDENTIAL
```

```
  ".4 DWELLING/ACRE"         A        3.29      0.98     0.900    32
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       75.85      0.75     0.900    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        7.12      0.61     1.000    66
  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.
   EQUIVALENT 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      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.19      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        3.83      0.75     0.900    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.743
```



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  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.
   EQUIVALENT 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 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        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
  TOTAL AREA(ACRES) =      5.75   PEAK FLOW RATE(CFS) =      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)<<<<<
============================================================================
```

```
  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         Ap     SCS
       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) =    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"                B        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) =    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"                B       33.25      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) =   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) =      61.66
```

```
 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL FAIR COVER
 "OPEN BRUSH"                B       36.51      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) =   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):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL FAIR COVER
 "OPEN BRUSH"                B       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) =   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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL FAIR COVER
 "OPEN BRUSH"                B       45.37      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) =   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.

****************************************************************************
```

```
 FLOW PROCESS FROM NODE  20128.00 TO NODE  20128.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL FAIR COVER
 "OPEN BRUSH"               B       27.94      0.61     1.000    66
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        8.51      0.75     0.700    56
 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL FAIR COVER
 "OPEN BRUSH"               B       18.57      0.61     1.000    66
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B       10.38      0.75     0.700    56
 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
```



```
 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  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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 ".4 DWELLING/ACRE"         B       28.04      0.75     0.900    56
 NATURAL FAIR COVER
 "OPEN BRUSH"               B       51.49      0.61     1.000    66
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B       30.71      0.75     0.700    56
 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
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       19.93      0.75     0.900    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 =  0.891
  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 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        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) =     11.39

  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       15.44      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) =   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) =      30.34

  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
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BROWSH"                B       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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BROWSH"                B       61.27      0.61     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"           B       11.25      0.75     0.900    56
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BROWSH"                B       27.90      0.61     1.000    66
  RESIDENTIAL
  ".4 DWELLING/ACRE"           B       18.45      0.75     0.900    56
  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) =     154.07
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        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      Fp         Ap     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) =   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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       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
```

```
  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       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     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
      2      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       Q      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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       20.34      0.75     0.900    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.62      0.75     0.600    56
  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) =   13.77
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        8.58      0.75     0.900    56
  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 =  0.897
  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) =     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  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%
```

```
          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 **
  PEAK FLOW RATE(CFS) =      362.28    Tc(MIN.) =   40.99
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       24.58      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) =   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.
   EQUIVALENT 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
```

```
  PEAK FLOW RATE(CFS)   =    869.45
================================================================================
================================================================================
  END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

```
 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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             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 20274                             *
* 10-YR  HC ULTIMATE CONDITION    OCT 2013   DMALOTT                    *
 ************************************************************************

  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 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
  USER SPECIFIED 1-HOUR INTENSITY(INCH/HOUR) = 0.9900

  *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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.936
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.864
  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
  "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
```

```
 MAXIMUM DEPTH(FEET) =   1.00
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.137
 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        6.32      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) =     20.95
 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
 SUBAREA AREA(ACRES) =    6.32       SUBAREA RUNOFF(CFS) =   14.52
 EFFECTIVE AREA(ACRES) =   10.96     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) =      25.18

 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) =  0.67   FLOOD WIDTH(FEET) =   40.71
 FLOW VELOCITY(FEET/SEC.) =   3.28   DEPTH*VELOCITY(FT*FT/SEC) =   2.20
 LONGEST FLOWPATH FROM NODE  20200.00 TO NODE  20202.00 =    1129.55 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  20202.00 TO NODE  20203.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =      37.28
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.50
   HALFSTREET FLOOD WIDTH(FEET) =   17.04
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.03
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.01
 STREET FLOW TRAVEL TIME(MIN.) =   1.02   Tc(MIN.) =   15.21
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.968
 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       11.02      0.98     0.600    32
 MOBILE HOME PARK           A        0.23      0.98     0.250    32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.593
 SUBAREA AREA(ACRES) =   11.25      SUBAREA RUNOFF(CFS) =   24.19
 EFFECTIVE AREA(ACRES) =     22.21    AREA-AVERAGED Fm(INCH/HR) =  0.58
 AREA-AVERAGED Fp(INCH/HR) =  0.98  AREA-AVERAGED Ap =  0.60
 TOTAL AREA(ACRES) =       22.2        PEAK FLOW RATE(CFS) =      47.70

 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) =  18.84
 FLOW VELOCITY(FEET/SEC.) =  6.38   DEPTH*VELOCITY(FT*FT/SEC.) =   3.41
 LONGEST FLOWPATH FROM NODE  20200.00 TO NODE  20203.00 =    1499.05 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  20203.00 TO NODE  20204.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>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
 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) =      61.65
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.61
   HALFSTREET FLOOD WIDTH(FEET) =   22.59
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.83
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.55
 STREET FLOW TRAVEL TIME(MIN.) =   1.20   Tc(MIN.) =   16.41
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.793
 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        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) =   27.92
 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) =      72.13
```

```
  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) =      88.81
    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.

****************************************************************************
```



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  FLOW PROCESS FROM NODE  20205.00 TO NODE  20206.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>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) =     105.63
    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           A        4.58      0.98     0.250    32
  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
```

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  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      Fp         Ap     SCS
       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) =    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
```



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----------------------------------------------------------------------------
  >>>>>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 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
  "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) =     19.65

  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) =      25.85
    ***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         Ap     SCS
       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
```

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  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.564
  SUBAREA AREA(ACRES) =    5.37      SUBAREA RUNOFF(CFS) =   12.39
  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) =      30.49

  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) = 0.52   HALFSTREET FLOOD WIDTH(FEET) =  19.17
  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.

****************************************************************************
  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) =      36.87
    ***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.) =    3.64
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.09
  STREET FLOW TRAVEL TIME(MIN.) =   1.16   Tc(MIN.) =   15.48
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.926
  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        2.35      0.98     0.600    32
  MOBILE HOME PARK           A        3.23      0.98     0.250    32
  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) =   12.75
  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) =      40.99

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
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  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) =  22.53
  FLOW VELOCITY(FEET/SEC.) =  3.77   DEPTH*VELOCITY(FT*FT/SEC.) =   2.22
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  253.2 FT WITH ELEVATION-DROP =   3.0 FT, IS   24.4 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE  20213.00
  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) =      43.45
    ***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.) =    3.63
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.23
  STREET FLOW TRAVEL TIME(MIN.) =   1.35   Tc(MIN.) =   16.83
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.737
  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        0.63      0.98     0.600    32
  MOBILE HOME PARK           A        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) =    4.92
  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) =      42.69

  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) = 0.61   HALFSTREET FLOOD WIDTH(FEET) =  23.57
  FLOW VELOCITY(FEET/SEC.) =  3.61   DEPTH*VELOCITY(FT*FT/SEC.) =   2.20
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  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
----------------------------------------------------------------------------
  >>>>>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.) =   16.83
  RAINFALL INTENSITY(INCH/HR) =   2.74
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.98
  AREA-AVERAGED Ap =  0.51
  EFFECTIVE STREAM AREA(ACRES) =      21.18
  TOTAL STREAM AREA(ACRES) =      21.18
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      42.69

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      104.22   20.33    2.353  0.97( 0.46) 0.47      60.6   20200.00
      2       42.69   16.83    2.737  0.98( 0.50) 0.51      21.2   20210.00

  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      146.47   16.83    2.737  0.98( 0.47) 0.48      71.3   20210.00
      2      139.59   20.33    2.353  0.97( 0.47) 0.48      81.8   20200.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     146.47    Tc(MIN.) =    16.83
  EFFECTIVE AREA(ACRES) =      71.32   AREA-AVERAGED Fm(INCH/HR) =  0.47
  AREA-AVERAGED Fp(INCH/HR) =  0.98  AREA-AVERAGED Ap =  0.48
  TOTAL AREA(ACRES) =       81.8
  LONGEST FLOWPATH FROM NODE  20200.00 TO NODE  20214.00 =    3451.11 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20214.00 TO NODE  20215.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1840.00  DOWNSTREAM ELEVATION(FEET) = 1793.00
  STREET LENGTH(FEET) =  1205.58   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
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  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) =     181.96
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.82
    HALFSTREET FLOOD WIDTH(FEET) =   39.77
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.71
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.34
  STREET FLOW TRAVEL TIME(MIN.) =   2.60   Tc(MIN.) =   19.43
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.439
  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       18.86      0.98     0.600    32
  MOBILE HOME PARK           A       19.95      0.98     0.250    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.98
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.420
  SUBAREA AREA(ACRES) =   38.81      SUBAREA RUNOFF(CFS) =   70.90
  EFFECTIVE AREA(ACRES) =    110.13    AREA-AVERAGED Fm(INCH/HR) =  0.45
  AREA-AVERAGED Fp(INCH/HR) =  0.97  AREA-AVERAGED Ap =  0.46
  TOTAL AREA(ACRES) =      120.6        PEAK FLOW RATE(CFS) =     197.21

  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) = 0.84   HALFSTREET FLOOD WIDTH(FEET) =  40.62
  FLOW VELOCITY(FEET/SEC.) =  7.90   DEPTH*VELOCITY(FT*FT/SEC.) =   6.63

  *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 MAXIMIZE STREETFLOW AT DOWNSTREAM NODE **
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.09
  PIPE-FLOW(CFS) =      41.17
  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
  TOTAL AREA(ACRES) =      120.6        PEAK FLOW RATE(CFS) =     208.42

  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) =  167.25
    ***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.) =    7.49
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.04

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```

```
 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
    2      191.98   21.86    2.220  0.98( 0.45) 0.46     120.6   20200.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     208.42  Tc(MIN.) =   18.36
  AREA-AVERAGED Fm(INCH/HR) =  0.45  AREA-AVERAGED Fp(INCH/HR) =  0.97
  AREA-AVERAGED Ap =  0.46  EFFECTIVE AREA(ACRES) =     110.13
  LONGEST FLOWPATH FROM NODE  20200.00 TO NODE  20215.00 =    4656.69 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20215.00 TO NODE  20216.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1793.00  DOWNSTREAM ELEVATION(FEET) = 1740.00
  STREET LENGTH(FEET) =  1725.28   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) =     247.55
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.92
    HALFSTREET FLOOD WIDTH(FEET) =   44.59
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.80
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    7.17
  STREET FLOW TRAVEL TIME(MIN.) =   3.68   Tc(MIN.) =   22.05
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.205
  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       24.17      0.98     0.600    32
  SCHOOL                     A        9.62      0.98     0.600    32
  MOBILE HOME PARK           A       14.92      0.98     0.250    32
  COMMERCIAL                 A        0.89      0.98     0.100    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.13      0.75     0.600    56
  COMMERCIAL                 B        0.31      0.75     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.484
  SUBAREA AREA(ACRES) =   50.04      SUBAREA RUNOFF(CFS) =   78.10
  EFFECTIVE AREA(ACRES) =    160.17    AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.97  AREA-AVERAGED Ap =  0.50
  TOTAL AREA(ACRES) =      170.6        PEAK FLOW RATE(CFS) =     247.76

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
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  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.92   HALFSTREET FLOOD WIDTH(FEET) =  44.59
  FLOW VELOCITY(FEET/SEC.) =  7.81   DEPTH*VELOCITY(FT*FT/SEC.) =   7.17

  *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:
  ** 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.) =  13.49
  PIPE-FLOW(CFS) =      66.27
  PIPEFLOW TRAVEL TIME(MIN.) =   2.13    Tc(MIN.) =  20.50
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.338
  SUBAREA AREA(ACRES) =   50.04      SUBAREA RUNOFF(CFS) =   84.08
  TOTAL AREA(ACRES) =      170.6        PEAK FLOW RATE(CFS) =     266.89

  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) =  200.62
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.87
    HALFSTREET FLOOD WIDTH(FEET) =   42.09
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.33
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.36

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      272.95   20.36    2.350  0.97( 0.46) 0.47     160.2   20210.00
      2      244.68   24.15    2.050  0.97( 0.46) 0.47     170.6   20200.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     272.95  Tc(MIN.) =   20.36
  AREA-AVERAGED Fm(INCH/HR) =  0.46  AREA-AVERAGED Fp(INCH/HR) =  0.97
  AREA-AVERAGED Ap =  0.47  EFFECTIVE AREA(ACRES) =     160.17
  LONGEST FLOWPATH FROM NODE  20200.00 TO NODE  20216.00 =    6381.97 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20216.00 TO NODE  20232.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1740.00  DOWNSTREAM ELEVATION(FEET) = 1739.00
  STREET LENGTH(FEET) =  1052.00   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
```

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MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) =   1.07

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     280.67
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  1.65
  HALFSTREET FLOOD WIDTH(FEET) =   81.27
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.26
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.74
STREET FLOW TRAVEL TIME(MIN.) =   7.75   Tc(MIN.) =   28.11
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.816
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
MOBILE HOME PARK           A        0.63      0.98     0.250    32
COMMERCIAL                 B        1.46      0.75     0.100    56
MOBILE HOME PARK           B        4.91      0.75     0.250    56
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) =   15.42
EFFECTIVE AREA(ACRES) =    171.27    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) =     272.95
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) = 1.64   HALFSTREET FLOOD WIDTH(FEET) =  80.48
FLOW VELOCITY(FEET/SEC.) =  2.25   DEPTH*VELOCITY(FT*FT/SEC.) =   3.68

*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.) =   4.83
PIPE-FLOW(CFS) =     199.45
PIPEFLOW TRAVEL TIME(MIN.) =   3.63    Tc(MIN.) =  24.00
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.061
SUBAREA AREA(ACRES) =   11.10      SUBAREA RUNOFF(CFS) =   17.87
TOTAL AREA(ACRES) =      181.7        PEAK FLOW RATE(CFS) =     272.95
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) =   73.50
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  1.07
  HALFSTREET FLOOD WIDTH(FEET) =   51.97
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.60
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.70
```



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  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      Fp         Ap     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      Fp         Ap     SCS
```

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     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) =      13.75
  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) =      20.16
    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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
```



```
  SUBAREA AREA(ACRES) =   11.15      SUBAREA RUNOFF(CFS) =   12.82
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           A        2.51      0.98     0.250    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        4.90      0.98     0.600    32
  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) =      33.53

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
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  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      Fp         Ap     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
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  LONGEST FLOWPATH FROM NODE  20220.00 TO NODE  20225.00 =    2080.68 FEET.

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  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         Ap     SCS
       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) =   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.

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  FLOW PROCESS FROM NODE  20226.00 TO NODE  20227.00 IS CODE =  63
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  >>>>>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) =      61.12
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.58
    HALFSTREET FLOOD WIDTH(FEET) =   22.04
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.85
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.40
  STREET FLOW TRAVEL TIME(MIN.) =   1.15   Tc(MIN.) =   31.12
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.674
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           A        9.70      0.98     0.250    32
  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) =   15.42
  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) =      66.61

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.60   HALFSTREET FLOOD WIDTH(FEET) =  22.77
  FLOW VELOCITY(FEET/SEC.) =  6.00   DEPTH*VELOCITY(FT*FT/SEC.) =   3.57
  *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
  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
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  STREET HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      72.14
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.58
    HALFSTREET FLOOD WIDTH(FEET) =   22.16
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.83
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.99
  STREET FLOW TRAVEL TIME(MIN.) =   0.91   Tc(MIN.) =   32.04
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.636
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           A        4.46      0.98     0.250    32
  PUBLIC PARK                A        4.98      0.98     0.850    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        1.96      0.98     0.600    32
  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) =   11.06
  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) =      75.56

  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) =  22.59
  FLOW VELOCITY(FEET/SEC.) =  6.91   DEPTH*VELOCITY(FT*FT/SEC.) =   4.09
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  374.5 FT WITH ELEVATION-DROP =  15.0 FT, IS   52.0 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
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 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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         Ap     SCS
      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
 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) =   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) =      87.21

 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
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 Manning's FRICTION FACTOR for Streetflow Section(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) =      97.50
   ***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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 MOBILE HOME PARK           A       11.14      0.98     0.250    32
 PUBLIC PARK                A        6.85      0.98     0.850    32
 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
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  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     117.92
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.69
  HALFSTREET FLOOD WIDTH(FEET) =   27.53
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.42
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.12
 STREET FLOW TRAVEL TIME(MIN.) =   2.02   Tc(MIN.) =   36.87
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.462
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 MOBILE HOME PARK           A       14.01      0.98     0.250    32
 MOBILE HOME PARK           B        8.21      0.75     0.250    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A        2.69      0.98     0.600    32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        3.23      0.75     0.600    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.88
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.324
 SUBAREA AREA(ACRES) =   28.14      SUBAREA RUNOFF(CFS) =   29.84
 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) =     126.14

 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) =  28.20
 FLOW VELOCITY(FEET/SEC.) =  7.58   DEPTH*VELOCITY(FT*FT/SEC.) =   5.34
 *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
 LONGEST FLOWPATH FROM NODE  20220.00 TO NODE  20231.00 =    5272.72 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  20231.00 TO NODE  20232.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>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
 STREET HALFWIDTH(FEET) = 18.00

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =     134.13
  ***STREET FLOWING FULL***
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  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.72
  HALFSTREET FLOOD WIDTH(FEET) =   29.12
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.58
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.48
 STREET FLOW TRAVEL TIME(MIN.) =   1.99   Tc(MIN.) =   38.86
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.401
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 MOBILE HOME PARK           A        0.17      0.98     0.250    32
 MOBILE HOME PARK           B        5.75      0.75     0.250    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B       11.10      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) =   17.02      SUBAREA RUNOFF(CFS) =   15.98
 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) =     134.62

 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) = 0.72   HALFSTREET FLOOD WIDTH(FEET) =  29.18
 FLOW VELOCITY(FEET/SEC.) =  7.58   DEPTH*VELOCITY(FT*FT/SEC.) =   5.48
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  905.4 FT WITH ELEVATION-DROP =  30.0 FT, IS   57.5 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE  20232.00
 LONGEST FLOWPATH FROM NODE  20220.00 TO NODE  20232.00 =    6178.11 FEET.

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 FLOW PROCESS FROM NODE  20232.00 TO NODE  20232.00 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.) =   38.86
 RAINFALL INTENSITY(INCH/HR) =   1.40
 AREA-AVERAGED Fm(INCH/HR) =  0.44
 AREA-AVERAGED Fp(INCH/HR) =  0.94
 AREA-AVERAGED Ap =  0.47
 EFFECTIVE STREAM AREA(ACRES) =     155.45
 TOTAL STREAM AREA(ACRES) =     155.45
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     134.62

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      272.95   24.00    2.061  0.96( 0.44) 0.46     171.3   20210.00
     1      244.68   27.87    1.828  0.96( 0.45) 0.46     181.7   20200.00
     2      134.62   38.86    1.401  0.94( 0.44) 0.47     155.4   20220.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  2 STREAMS.
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 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      407.57   24.00    2.061  0.95( 0.44) 0.46     267.3   20210.00
     2      379.29   27.87    1.828  0.95( 0.44) 0.46     293.2   20200.00
     3      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      Fp         Ap     SCS
      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
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 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
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  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      Fp         Ap      SCS   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) =     21.94
  TOTAL AREA(ACRES) =      8.56   PEAK FLOW RATE(CFS) =     21.94

  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      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        A        1.59      0.98     0.600    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        B        2.06      0.75     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) =     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.

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  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      Fp         Ap      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    56
  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) =   15.57
  EFFECTIVE 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) = 26.00

  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
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 MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) =   0.81

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      53.55
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.59
   HALFSTREET FLOOD WIDTH(FEET) =   21.58
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.53
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.26
 STREET FLOW TRAVEL TIME(MIN.) =   0.89   Tc(MIN.) =   15.19
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.971
 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        3.29      0.98     0.600    32
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        4.18      0.75     0.600    56
 RESIDENTIAL
 ".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(ACRES) =    8.59      SUBAREA RUNOFF(CFS) =   18.87
 EFFECTIVE AREA(ACRES) =     27.46    AREA-AVERAGED Fm(INCH/HR) =  0.52
 AREA-AVERAGED Fp(INCH/HR) =  0.85  AREA-AVERAGED Ap =  0.62
 TOTAL AREA(ACRES) =       27.5        PEAK FLOW RATE(CFS) =      60.50

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.61   HALFSTREET FLOOD WIDTH(FEET) =  22.63
 FLOW VELOCITY(FEET/SEC.) =  5.70   DEPTH*VELOCITY(FT*FT/SEC.) =   3.48
 LONGEST FLOWPATH FROM NODE  20240.00 TO NODE  20244.00 =    1694.78 FEET.

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 FLOW PROCESS FROM NODE  20244.00 TO NODE  20245.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(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
 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) =   0.73

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      68.68
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.59
   HALFSTREET FLOOD WIDTH(FEET) =   21.69
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   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      Fp         Ap     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    56
 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):
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 DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      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"        B        5.36      0.75      0.600    56
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
SUBAREA AREA(ACRES) =   10.19      SUBAREA RUNOFF(CFS) =   20.27
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) =      90.22

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) = 0.70   HALFSTREET FLOOD WIDTH(FEET) =  27.77
FLOW VELOCITY(FEET/SEC.) =  5.94   DEPTH*VELOCITY(FT*FT/SEC.) =   4.17
LONGEST FLOWPATH FROM NODE  20240.00 TO NODE  20246.00 =    2326.78 FEET.

****************************************************************************
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)<<<<<
============================================================================
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

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) =      98.25
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.71
  HALFSTREET FLOOD WIDTH(FEET) =   28.07
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.32
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.48
STREET FLOW TRAVEL TIME(MIN.) =   0.85   Tc(MIN.) =   17.73
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.626
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        3.02      0.98      0.600    32
RESIDENTIAL
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"3-4 DWELLINGS/ACRE"        B        4.88      0.75      0.600    56
RESIDENTIAL
".4 DWELLING/ACRE"          B        0.55      0.75      0.900    56
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) =   16.08
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) =     101.97

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) = 0.72   HALFSTREET FLOOD WIDTH(FEET) =  28.44
FLOW VELOCITY(FEET/SEC.) =  6.39   DEPTH*VELOCITY(FT*FT/SEC.) =   4.57
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) =     108.86
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.69
  HALFSTREET FLOOD WIDTH(FEET) =   26.97
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.60
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.21
STREET FLOW TRAVEL TIME(MIN.) =   0.58   Tc(MIN.) =   18.30
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.560
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        1.94      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
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  SUBAREA AREA(ACRES) =    7.43      SUBAREA RUNOFF(CFS) =   13.78
  EFFECTIVE AREA(ACRES) =     61.27    AREA-AVERAGED Fm(INCH/HR) =  0.52
  AREA-AVERAGED Fp(INCH/HR) =  0.83  AREA-AVERAGED Ap =  0.62
  TOTAL AREA(ACRES) =       61.3        PEAK FLOW RATE(CFS) =     112.53

  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) = 0.69   HALFSTREET FLOOD WIDTH(FEET) =  27.22
  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.

****************************************************************************
  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) =     130.00
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.77
    HALFSTREET FLOOD WIDTH(FEET) =   31.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.84
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.25
  STREET FLOW TRAVEL TIME(MIN.) =   3.87   Tc(MIN.) =   22.17
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.195
  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        0.28      0.98     0.600    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       21.09      0.75     0.600    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        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
  SUBAREA AREA(ACRES) =   22.22      SUBAREA RUNOFF(CFS) =   34.89
  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) =     127.33
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  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) = 0.76   HALFSTREET FLOOD WIDTH(FEET) =  30.76
  FLOW VELOCITY(FEET/SEC.) =  6.81   DEPTH*VELOCITY(FT*FT/SEC.) =   5.19
  LONGEST FLOWPATH FROM NODE  20240.00 TO NODE  20249.00 =    4503.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20249.00 TO NODE  20249.00 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.) =   22.17
  RAINFALL INTENSITY(INCH/HR) =   2.20
  AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.81
  AREA-AVERAGED Ap =  0.62
  EFFECTIVE STREAM AREA(ACRES) =      83.49
  TOTAL STREAM AREA(ACRES) =      83.49
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     127.33

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      407.57   26.42    1.908  0.94( 0.44) 0.47     285.7   20210.00
      1      379.29   30.35    1.708  0.94( 0.44) 0.47     311.6   20200.00
      1      303.74   41.53    1.329  0.94( 0.44) 0.47     355.6   20220.00
      2      127.33   22.17    2.195  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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      534.90   22.17    2.195  0.90( 0.46) 0.51     323.3   20240.00
      2      513.33   26.42    1.908  0.90( 0.46) 0.51     369.2   20210.00
      3      470.00   30.35    1.708  0.91( 0.46) 0.50     395.1   20200.00
      4      365.96   41.53    1.329  0.91( 0.45) 0.50     439.1   20220.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     534.90    Tc(MIN.) =    22.17
  EFFECTIVE AREA(ACRES) =     323.27   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.

****************************************************************************
  FLOW PROCESS FROM NODE  20249.00 TO NODE  20250.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 13 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1735.00  DOWNSTREAM ELEVATION(FEET) = 1733.00
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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      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
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
```

```
  CHANNEL FLOW THRU SUBAREA(CFS) =     869.45
  FLOW VELOCITY(FEET/SEC.) =  24.92   FLOW DEPTH(FEET) =   2.37
  TRAVEL TIME(MIN.) =   1.11   Tc(MIN.) =   43.21
  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.) =   43.21
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.287
  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        1.58      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       54.48      0.75     0.900    56
  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= 0.31;30M= 0.64;1H= 0.85;3H= 1.57;6H= 2.38;24H= 4.87
  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.
  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.
   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) = 16.58  RUNOFF VOLUME(AF) =     267.31
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =     872.67
  TOTAL AREA(ACRES) =     1781.1       PEAK FLOW RATE(CFS) =     872.67

  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  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) =      872.67    Tc(MIN.) =   43.21
  AREA-AVERAGED Fm(INCH/HR) =  0.61    Ybar = 0.66
  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
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      534.90   22.79    2.148  0.90( 0.46) 0.51     324.3   20240.00
      2      513.33   27.03    1.874  0.90( 0.46) 0.51     370.2   20210.00
```



```
      3      470.00   30.96    1.681  0.90( 0.46) 0.50     396.1   20200.00
      4      365.96   42.07    1.315  0.91( 0.45) 0.50     440.1   20220.00
  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= 0.31;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%
           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
  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=.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
  PEAK FLOW RATE(CFS) =    1106.09

****************************************************************************
  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
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1733.00  DOWNSTREAM(FEET) =   1670.00
  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
  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
  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 =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   44.78
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.251
  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        3.23      0.75     0.600    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        0.07      0.98     0.600    32
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        9.49      0.75     0.900    56
  SCHOOL                     B       24.91      0.75     0.600    56
```

```
  SCHOOL                     A        0.90      0.98     0.600    32
  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 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        4.43      0.61     1.000    66   11.82
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        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) =     28.00
```



```
  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43

****************************************************************************
  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      Fp         Ap     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"               B       15.90      0.61     1.000    66
  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) =      87.86

  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.
```

```
****************************************************************************
  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      Fp         Ap     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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       17.48      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        7.48      0.61     1.000    66
  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
```



```
  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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        6.85      0.75     0.700    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.71      0.75     0.900    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       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) =  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
  TOTAL AREA(ACRES) =      127.7       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.
```

```
****************************************************************************
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       10.89      0.75     0.700    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       11.99      0.75     0.900    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        4.30      0.61     1.000    66
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       53.81      0.75     0.700    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       46.51      0.75     0.900    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       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) =  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       30.11      0.75     0.900    56
  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 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
  CHANNEL FLOW THRU SUBAREA(CFS) =     403.23
  FLOW VELOCITY(FEET/SEC.) =  10.99   FLOW DEPTH(FEET) =   2.46
  TRAVEL TIME(MIN.) =   0.58   Tc(MIN.) =   27.75
  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.) =   27.75
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.835
  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       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) =   57.93
  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) =     451.25

  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  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) =     451.25
  FLOW VELOCITY(FEET/SEC.) =  10.51   FLOW DEPTH(FEET) =   2.76
  TRAVEL TIME(MIN.) =   3.72   Tc(MIN.) =   31.47
  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.) =   31.47
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.659
  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        5.45      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       71.00      0.75     0.900    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        5.28      0.61     1.000    66
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       40.34      0.75     0.700    56
  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) =  115.13
  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) =     502.01

  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  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
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =     570.10
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  1.24
    HALFSTREET FLOOD WIDTH(FEET) =   60.64
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    8.70
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   10.79
  STREET FLOW TRAVEL TIME(MIN.) =   1.33   Tc(MIN.) =   32.79
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.605
  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      100.00      0.75     0.900    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       27.18      0.75     0.900    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       11.00      0.75     0.600    56
  RESIDENTIAL
```

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"2 DWELLINGS/ACRE"          B       18.36      0.75     0.700    56
NATURAL FAIR COVER
"OPEN BRUSH"                B        0.17      0.61     1.000    66
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) =  136.14
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) =     612.48

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) = 1.27   HALFSTREET FLOOD WIDTH(FEET) =  62.11
FLOW VELOCITY(FEET/SEC.) =  8.86   DEPTH*VELOCITY(FT*FT/SEC.) =  11.25

*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) =  69.00    NUMBER OF PIPES =   1
DEPTH OF FLOW IN  69.0 INCH PIPE IS  55.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =  22.51
PIPE-FLOW(CFS) =     502.01
PIPEFLOW TRAVEL TIME(MIN.) =   0.51    Tc(MIN.) =  31.98
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.638
SUBAREA AREA(ACRES) =  156.71      SUBAREA RUNOFF(CFS) =  140.74
TOTAL AREA(ACRES) =      685.7        PEAK FLOW RATE(CFS) =     632.60

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =  130.59
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.81
  HALFSTREET FLOOD WIDTH(FEET) =   39.40
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.68
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.62
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L =   692.8 FT WITH ELEVATION-DROP =  15.0 FT, IS  411.2 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= 0.30;30M= 0.61;1H= 0.80;3H= 1.43;6H= 2.06;24H= 4.43
  S-GRAPH: VALLEY(DEV.)= 28.6%;VALLEY(UNDEV.)/DESERT= 71.4%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  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.
  DEPTH-AREA FACTORS: 5M = 0.97; 30M = 0.97; 1HR = 0.97;
```



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  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=.0538; Lca/L=0.4,n=.0482; Lca/L=0.5,n=.0443;Lca/L=0.6,n=.0414
  TIME OF PEAK FLOW(HR) = 16.42  RUNOFF VOLUME(AF) =      87.65
  UNIT-HYDROGRAPH METHOD PEAK FLOW RATE(CFS) =    408.28
  TOTAL PEAK FLOW RATE(CFS) =    408.28 (SOURCE FLOW INCLUDED)
  RATIONAL METHOD PEAK FLOW RATE(CFS) =    632.60
   (UPSTREAM NODE PEAK FLOW RATE(CFS) =    632.60)
  PEAK FLOW RATE(CFS) USED =    632.60

****************************************************************************
  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) =     671.20
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  1.34
    HALFSTREET FLOOD WIDTH(FEET) =   65.77
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    8.55
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   11.48
  STREET FLOW TRAVEL TIME(MIN.) =   2.65   Tc(MIN.) =   34.63
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.537
  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       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= 0.30;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) = 0.58; 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 = 0.97; 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.
   EQUIVALENT 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.
   EQUIVALENT 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)<<<<<
============================================================================
```



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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) =     653.91
  ***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      Fp         Ap      SCS
     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
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
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) =      839.2
LONGEST FLOWPATH FROM NODE  20260.00 TO NODE  20273.00 =   11605.33 FEET.
 EQUIVALENT 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
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  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 Tc :
  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
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    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        2.08      0.75     0.900    56
  SCHOOL                     B        0.94      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.807
  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) =      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) =     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.
   EQUIVALENT 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
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```
  TIME OF PEAK FLOW(HR) = 16.50  RUNOFF VOLUME(AF) =     104.89
  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
  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      Q        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.
   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) =     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.) =     44.78
  AREA-AVERAGED Fm(INCH/HR)=  0.59   Ybar =  0.65
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  PEAK FLOW RATE(CFS)   =   1378.41
============================================================================
============================================================================
  END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
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                          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

  *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 0.0313 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   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  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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.287
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.624
  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        6.22      0.61     1.000    66   12.01
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.99      0.75     0.900    56    8.29
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.63
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.986
  SUBAREA RUNOFF(CFS) =     12.99
  TOTAL AREA(ACRES) =      7.21   PEAK FLOW RATE(CFS) =     12.99

  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  20301.00 TO NODE  20302.00 IS CODE =  54
 ----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  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) =      12.99
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.12      0.75     0.900    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        4.14      0.61     1.000    66
  SCHOOL                     B        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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        4.15      0.61     1.000    66
```



```
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.80      0.75     0.900    56
  SCHOOL                     B       20.38      0.75     0.600    56
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       18.37      0.61     1.000    66
  SCHOOL                     B       15.66      0.75     0.600    56
  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
```

```
  CHANNEL LENGTH THRU SUBAREA(FEET) =   823.37   CHANNEL SLOPE =  0.0729
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      62.01
  FLOW VELOCITY(FEET/SEC.) =   3.85   FLOW DEPTH(FEET) =   0.57
  TRAVEL TIME(MIN.) =   3.56   Tc(MIN.) =   25.77
  LONGEST FLOWPATH FROM NODE  20300.00 TO NODE  20305.00 =    3755.94 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20305.00 TO NODE  20305.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   25.77
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.328
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        9.94      0.61     1.000    66
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        0.01      0.75     0.700    56
  SCHOOL                     B        7.91      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.66
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.823
  SUBAREA AREA(ACRES) =   17.86      SUBAREA RUNOFF(CFS) =   12.66
  EFFECTIVE AREA(ACRES) =     92.35   AREA-AVERAGED Fm(INCH/HR) =  0.53
  AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap =  0.79
  TOTAL AREA(ACRES) =       92.3       PEAK FLOW RATE(CFS) =      66.35

  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  20305.00 TO NODE  20306.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2220.00  DOWNSTREAM(FEET) =   2190.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   801.97   CHANNEL SLOPE =  0.0374
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   3.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      66.35
  FLOW VELOCITY(FEET/SEC.) =   3.06   FLOW DEPTH(FEET) =   0.66
  TRAVEL TIME(MIN.) =   4.37   Tc(MIN.) =   30.14
  LONGEST FLOWPATH FROM NODE  20300.00 TO NODE  20306.00 =    4557.91 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20306.00 TO NODE  20306.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   30.14
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.209
  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        1.66      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       13.33      0.61     1.000    66
  SCHOOL                     B        2.17      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.63
  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
  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

  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  20306.00 TO NODE  20307.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2190.00  DOWNSTREAM(FEET) =   2185.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   181.13   CHANNEL SLOPE =  0.0276
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   3.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      66.35
  FLOW VELOCITY(FEET/SEC.) =   2.72   FLOW DEPTH(FEET) =   0.70
  TRAVEL TIME(MIN.) =   1.11   Tc(MIN.) =   31.26
  LONGEST FLOWPATH FROM NODE  20300.00 TO NODE  20307.00 =    4739.04 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20307.00 TO NODE  20307.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   31.26
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.183
  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        1.33      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.26      0.75     0.600    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        3.26      0.61     1.000    66
  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) =    2.63
  EFFECTIVE AREA(ACRES) =    114.36   AREA-AVERAGED Fm(INCH/HR) =  0.54
  AREA-AVERAGED Fp(INCH/HR) =  0.66  AREA-AVERAGED Ap =  0.82
  TOTAL AREA(ACRES) =      114.4       PEAK FLOW RATE(CFS) =      66.35
  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  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) =      66.35
  FLOW VELOCITY(FEET/SEC.) =   3.04   FLOW DEPTH(FEET) =   0.66
  TRAVEL TIME(MIN.) =   1.48   Tc(MIN.) =   32.74
  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.) =   32.74
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.151
  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        2.10      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.65      0.75     0.600    56
  NATURAL FAIR COVER
  "OPEN BROWSH"              B        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) =    2.20
  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) =      66.35
  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  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
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
```



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  Manning's FRICTION FACTOR for Streetflow Section(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) =      67.82
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.55
    HALFSTREET FLOOD WIDTH(FEET) =   20.27
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.58
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.13
  STREET FLOW TRAVEL TIME(MIN.) =   0.95   Tc(MIN.) =   33.68
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.131
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BROWSH"              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) =    2.94
  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) =      66.35
  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.) =  7.54   DEPTH*VELOCITY(FT*FT/SEC.) =   4.08
  LONGEST FLOWPATH FROM NODE  20300.00 TO NODE  20309.00 =    5439.79 FEET.

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  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
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  **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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        3.69      0.75     0.700    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.

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 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
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  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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        2.87      0.75     0.700    56
 NATURAL FAIR COVER
 "OPEN BRUSH"               B        1.50      0.61     1.000    66
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        0.78      0.75     0.600    56
 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.

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 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):
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 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 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

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) =  19.29
FLOW VELOCITY(FEET/SEC.) =  8.69   DEPTH*VELOCITY(FT*FT/SEC.) =   4.57
LONGEST FLOWPATH FROM NODE  20300.00 TO NODE  20312.00 =    6575.98 FEET.

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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) =      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
STREET FLOW TRAVEL TIME(MIN.) =   1.22   Tc(MIN.) =   37.29
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.064
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        6.45      0.75     0.700    56
RESIDENTIAL
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"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:
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.

****************************************************************************
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) =      75.58
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.58
  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
NATURAL FAIR COVER
"OPEN BRUSH"                B        3.76      0.61     1.000    66
RESIDENTIAL
"2 DWELLINGS/ACRE"          B        5.77      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
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  SUBAREA AREA(ACRES) =   10.63      SUBAREA RUNOFF(CFS) =    4.77
  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) =      75.43

  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) = 0.58   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.

****************************************************************************
  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) =      77.51
    ***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.) =    8.76
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.75
  STREET FLOW TRAVEL TIME(MIN.) =   0.97   Tc(MIN.) =   39.35
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.030
  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        6.85      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.24      0.75     0.600    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        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) =    4.17
  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) =      77.26
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  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) =  20.15
  FLOW VELOCITY(FEET/SEC.) =  8.73   DEPTH*VELOCITY(FT*FT/SEC.) =   4.74
  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) =      78.93
    ***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.) =    7.96
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.53
  STREET FLOW TRAVEL TIME(MIN.) =   1.09   Tc(MIN.) =   40.44
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.014
  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        6.12      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.25      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) =    7.37      SUBAREA RUNOFF(CFS) =    3.33
  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) =      77.94

  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) = 0.57   HALFSTREET FLOOD WIDTH(FEET) =  21.37
  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.
```

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****************************************************************************
  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         Ap     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    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
----------------------------------------------------------------------------
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```
  >>>>>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

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      80.42
    ***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.) =    7.46
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.39
  STREET 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     SCS
       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"         B        0.01      0.75     0.900    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       10.92      0.75     0.700    56
  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 =  0.79
  TOTAL AREA(ACRES) =      200.3        PEAK FLOW RATE(CFS) =      78.67

  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) = 0.58   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
```

```
  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) =     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      Fp         Ap     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
  "2 DWELLINGS/ACRE"         B      100.00      0.75     0.700    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       28.82      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       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)<<<<<
============================================================================
```



```
  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) =     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      Fp         Ap     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
```

```
  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      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) =      8.20
  TOTAL AREA(ACRES) =      9.71   PEAK FLOW RATE(CFS) =      8.20

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43

****************************************************************************
  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) =       8.20
  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      Fp         Ap     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    56
```



```
  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      Fp         Ap     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"                B        8.32      0.61     1.000    66
  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
```

```
 MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   2.00
 CHANNEL FLOW THRU SUBAREA(CFS) =      25.66
 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):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B       14.74      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) =   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      Fp         Ap     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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B       48.19      0.75     0.700    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        0.06      0.75     0.600    56
 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
```

```
  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      Fp         Ap     SCS
       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
  CHANNEL FLOW THRU SUBAREA(CFS) =      47.37
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       25.33      0.75     0.700    56
  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 =  0.699
  SUBAREA AREA(ACRES) =   25.60      SUBAREA RUNOFF(CFS) =    7.36
```



```
  EFFECTIVE AREA(ACRES) =    160.82   AREA-AVERAGED Fm(INCH/HR) =  0.54
  AREA-AVERAGED Fp(INCH/HR) =  0.71  AREA-AVERAGED Ap =  0.76
  TOTAL AREA(ACRES) =      160.8       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  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) =      49.19
    ***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      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) =    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.
```

```
****************************************************************************
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.48      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        5.88      0.75     0.900    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       11.27      0.75     0.700    56
  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) =      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) = 0.49   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) =   0.80
  AREA-AVERAGED Fm(INCH/HR) =  0.54
  AREA-AVERAGED Fp(INCH/HR) =  0.72
  AREA-AVERAGED Ap =  0.76
  EFFECTIVE 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
      2       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      Tc   Intensity   Fp(Fm)     Ap     Ae     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) =     183.38
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
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    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):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.05      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       12.65      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) =   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):
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```
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        6.76      0.75     0.700    56   13.21
  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) =     10.96
  TOTAL AREA(ACRES) =      7.88   PEAK FLOW RATE(CFS) =     10.96

  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  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) =      10.96
  FLOW VELOCITY(FEET/SEC.) =   2.40   FLOW DEPTH(FEET) =   0.30
  TRAVEL TIME(MIN.) =   2.76   Tc(MIN.) =   15.18
  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.) =   15.18
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.825
  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        4.25      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.25      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) =    4.50      SUBAREA RUNOFF(CFS) =    5.29
  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) =      14.59

  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  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) =      14.59
  FLOW VELOCITY(FEET/SEC.) =   2.23   FLOW DEPTH(FEET) =   0.36
  TRAVEL TIME(MIN.) =   3.27   Tc(MIN.) =   18.45
  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.) =   18.45
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.623
  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        5.37      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        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) =    5.70
  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) =      18.05

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43

****************************************************************************
  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) =      18.05
  FLOW VELOCITY(FEET/SEC.) =   2.26   FLOW DEPTH(FEET) =   0.40
  TRAVEL TIME(MIN.) =   3.66   Tc(MIN.) =   22.12
  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.) =   22.12
  *  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
  "2 DWELLINGS/ACRE"         B        2.06      0.75     0.700    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        2.77      0.75     0.900    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.07      0.75     0.600    56
  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) =    3.74
  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) =      19.07

  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  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) =      19.07
  FLOW VELOCITY(FEET/SEC.) =   2.69   FLOW DEPTH(FEET) =   0.38
  TRAVEL TIME(MIN.) =   3.57   Tc(MIN.) =   25.68
  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.) =   25.68
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.331
  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       12.00      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.27      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        3.29      0.75     0.900    56
  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) =   10.88
  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) =      27.36

  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  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) =      27.36
  FLOW VELOCITY(FEET/SEC.) =   3.15   FLOW DEPTH(FEET) =   0.42
  TRAVEL TIME(MIN.) =   2.96   Tc(MIN.) =   28.64
  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.) =   28.64
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.247
  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        3.53      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.62      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        3.41      0.75     0.900    56
  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) =    4.50
  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) =      28.94

  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  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
  STREET HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      31.96
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.46
    HALFSTREET FLOOD WIDTH(FEET) =   16.48
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.64
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.57
  STREET FLOW TRAVEL TIME(MIN.) =   2.94   Tc(MIN.) =   31.57
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.176
  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        2.71      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        6.04      0.75     0.700    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        1.62      0.75     0.900    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.705
  SUBAREA AREA(ACRES) =   10.37      SUBAREA RUNOFF(CFS) =    6.05
  EFFECTIVE AREA(ACRES) =     56.51    AREA-AVERAGED Fm(INCH/HR) =  0.55
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.73
  TOTAL AREA(ACRES) =       56.5        PEAK FLOW RATE(CFS) =      32.05

  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) = 0.46   HALFSTREET FLOOD WIDTH(FEET) =  16.55
  FLOW VELOCITY(FEET/SEC.) =  5.61   DEPTH*VELOCITY(FT*FT/SEC.) =   2.56
  LONGEST FLOWPATH FROM NODE  20340.00 TO NODE  20347.00 =    4458.51 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20347.00 TO NODE  20348.00 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) =   874.50   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) =   0.78

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      35.66
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
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```
    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):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.78      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       12.66      0.75     0.700    56
  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) =      36.21

  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) =      44.47
    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      Fp         Ap     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) =   16.52
  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) =      49.70

  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) = 0.49   HALFSTREET FLOOD WIDTH(FEET) =  18.00
  FLOW VELOCITY(FEET/SEC.) =  7.14   DEPTH*VELOCITY(FT*FT/SEC.) =   3.52
  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.) =   37.08
  RAINFALL INTENSITY(INCH/HR) =   1.07
  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 =      49.70

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      181.03   49.37    0.899  0.71( 0.54) 0.76     522.5   20300.00
      1      134.35   63.77    0.771  0.71( 0.54) 0.76     567.5   20320.00
      2       49.70   37.08    1.068  0.75( 0.53) 0.71     103.6   20340.00

  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      230.73   37.08    1.068  0.72( 0.54) 0.75     495.9   20340.00
      2      215.01   49.37    0.899  0.71( 0.54) 0.76     626.0   20300.00
      3      156.40   63.77    0.771  0.71( 0.54) 0.76     671.1   20320.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     230.73    Tc(MIN.) =    37.08
  EFFECTIVE AREA(ACRES) =     495.93   AREA-AVERAGED Fm(INCH/HR) =  0.54
  AREA-AVERAGED Fp(INCH/HR) =  0.72  AREA-AVERAGED Ap =  0.75
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  TOTAL AREA(ACRES) =      671.1
  LONGEST FLOWPATH FROM NODE  20300.00 TO NODE  20349.00 =   12513.68 FEET.

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  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= 0.30;30M= 0.61;1H= 0.80;3H= 1.43;6H= 2.06;24H= 4.43
  S-GRAPH: VALLEY(DEV.)= 76.1%;VALLEY(UNDEV.)/DESERT= 23.9%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  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.
  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=.0682; Lca/L=0.4,n=.0612; Lca/L=0.5,n=.0562;Lca/L=0.6,n=.0524
  TIME OF PEAK FLOW(HR) = 16.67  RUNOFF VOLUME(AF) =     103.64
  UNIT-HYDROGRAPH METHOD PEAK FLOW RATE(CFS) =    344.48
  TOTAL PEAK FLOW RATE(CFS) =    344.48 (SOURCE FLOW INCLUDED)
  RATIONAL METHOD PEAK FLOW RATE(CFS) =    230.73
   (UPSTREAM NODE PEAK FLOW RATE(CFS) =    230.73)
  PEAK FLOW RATE(CFS) USED =    344.48

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  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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =     352.05
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.91
    HALFSTREET FLOOD WIDTH(FEET) =   38.64
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   11.51
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   10.50
  STREET FLOW TRAVEL TIME(MIN.) =   1.87   Tc(MIN.) =   51.24
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.879
  SUBAREA LOSS RATE DATA(AMC  II):
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 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
RESIDENTIAL
"3-4 DWELLINGS/ACRE"       B        4.52      0.75     0.600    56
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= 0.30;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%
         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
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=.0719; Lca/L=0.4,n=.0645; Lca/L=0.5,n=.0592;Lca/L=0.6,n=.0553
TIME OF PEAK FLOW(HR) = 16.75  RUNOFF VOLUME(AF) =     112.06
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =     364.55
TOTAL AREA(ACRES) =      747.7        PEAK FLOW RATE(CFS) =     364.55

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) = 0.92   HALFSTREET FLOOD WIDTH(FEET) =  39.19
FLOW VELOCITY(FEET/SEC.) = 11.59   DEPTH*VELOCITY(FT*FT/SEC.) =  10.71

*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) =  45.00    NUMBER OF PIPES =   1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY(FEET/SEC.) =  23.49
PIPE-FLOW(CFS) =     259.72
PIPEFLOW TRAVEL TIME(MIN.) =   0.92    Tc(MIN.) =  50.29
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.)= 68.9%;VALLEY(UNDEV.)/DESERT= 31.1%
         MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
Tc(HR) = 0.82; LAG(HR) = 0.66; Fm(INCH/HR) = 0.55; Ybar = 0.63
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) =      747.7
LONGEST FLOWPATH FROM NODE  20300.00 TO NODE  20350.00 =   13803.84 FEET.
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3,n=.0631; Lca/L=0.4,n=.0566; Lca/L=0.5,n=.0520;Lca/L=0.6,n=.0485
TIME OF PEAK FLOW(HR) = 16.67  RUNOFF VOLUME(AF) =     112.06
TOTAL AREA(ACRES) =      747.7        PEAK FLOW RATE(CFS) =     363.38

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 :
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  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

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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        7.14      0.75     0.600    56
  RESIDENTIAL
  ".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= 0.30;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.
   EQUIVALENT 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
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  TIME OF PEAK FLOW(HR) = 16.75  RUNOFF VOLUME(AF) =     121.01
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =     388.20
  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) =      827.4
  LONGEST FLOWPATH FROM NODE  20300.00 TO NODE  20351.00 =   15145.87 FEET.
   EQUIVALENT 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 Tc :
  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

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  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
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OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(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) =     392.96
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  1.10
  HALFSTREET FLOOD WIDTH(FEET) =   47.92
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    8.42
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    9.25
STREET FLOW TRAVEL TIME(MIN.) =   2.16   Tc(MIN.) =   53.66
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.855
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       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= 0.30;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) = 0.89; LAG(HR) = 0.72; 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) =      843.8
LONGEST FLOWPATH FROM NODE  20300.00 TO NODE  20352.00 =   15145.87 FEET.
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3,n=.0636; Lca/L=0.4,n=.0570; Lca/L=0.5,n=.0524;Lca/L=0.6,n=.0489
TIME OF PEAK FLOW(HR) = 16.75  RUNOFF VOLUME(AF) =     122.80
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =     390.39
TOTAL AREA(ACRES) =      843.8        PEAK FLOW RATE(CFS) =     391.54
NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 1.10   HALFSTREET FLOOD WIDTH(FEET) =  47.86
FLOW VELOCITY(FEET/SEC.) =  8.41   DEPTH*VELOCITY(FT*FT/SEC.) =   9.23

*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
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  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) =      843.8
  LONGEST FLOWPATH FROM NODE  20300.00 TO NODE  20352.00 =   16236.90 FEET.
   EQUIVALENT 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.

****************************************************************************
```

```
 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) =    1378.41
 FLOW VELOCITY(FEET/SEC.) =  25.84   FLOW DEPTH(FEET) =   3.24
 TRAVEL TIME(MIN.) =   0.40   Tc(MIN.) =   45.18
 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.) =   45.18
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.948
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 SCHOOL                     B       10.49      0.75     0.600    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        1.59      0.75     0.600    56
 RESIDENTIAL
 ".4 DWELLING/ACRE"         B       21.45      0.75     0.900    56
 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= 0.31;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) =     3135.5
 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) =     459.68
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    1381.80
 TOTAL AREA(ACRES) =     3135.5       PEAK FLOW RATE(CFS) =    1381.80

 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  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.) =   45.18
 AREA-AVERAGED Fm(INCH/HR) =  0.59    Ybar = 0.65
 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) =      394.75    Tc(MIN.) =   52.52
 AREA-AVERAGED Fm(INCH/HR) =  0.56    Ybar = 0.64
 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= 0.30;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= 0.99
 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=.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.) =   46.14
 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.) =   46.14
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.937
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  SCHOOL                     B       20.64      0.75     0.600    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.09      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       25.75      0.75     0.900    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.69      0.61     1.000    66
  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= 0.30;30M= 0.62;1H= 0.82;3H= 1.49;6H= 2.20;24H= 4.62
  S-GRAPH: VALLEY(DEV.)= 40.8%;VALLEY(UNDEV.)/DESERT= 59.2%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.77; LAG(HR) = 0.62; 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= 0.99
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =     4029.5
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  20353.00 =   21552.11 FEET.
   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
  TIME OF PEAK FLOW(HR) = 16.67  RUNOFF VOLUME(AF) =     581.93
  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

  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  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
  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.) =  24.30   FLOW DEPTH(FEET) =   3.57
  TRAVEL TIME(MIN.) =   0.94   Tc(MIN.) =   47.08
  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.) =   47.08
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.925
```



```
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B       13.67      0.75     0.250    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       19.97      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        5.87      0.75     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= 0.30;30M= 0.62;1H= 0.82;3H= 1.49;6H= 2.20;24H= 4.62
  S-GRAPH: VALLEY(DEV.)= 41.3%;VALLEY(UNDEV.)/DESERT= 58.7%
           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 = 0.82; 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=.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) =     589.86
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    1671.17
  TOTAL AREA(ACRES) =     4069.0       PEAK FLOW RATE(CFS) =    1671.17

  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  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) =    1671.17    Tc(MIN.) =   47.08
  AREA-AVERAGED Fm(INCH/HR) =  0.58   Ybar = 0.65
  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
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.093
  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        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) =      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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        5.52      0.75     0.700    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        0.40      0.75     0.600    56
 NATURAL FAIR COVER
 "OPEN BRUSH"               B        3.20      0.61     1.000    66
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"      B        3.04      0.75     0.400    56
 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      Fp         Ap     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"         B        5.13      0.75     0.700    56
 NATURAL FAIR COVER
 "OPEN BRUSH"               B        0.30      0.61     1.000    66
 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
```

```
      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"       B        1.47      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) =   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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.95      0.75     0.600    56
  RESIDENTIAL
  "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) =    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<<<<<
```



```
  >>>>>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) =      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      Fp         Ap     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"         B        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):
```

```
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"          B       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      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"          B       15.48      0.75      0.700    56
 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
----------------------------------------------------------------------------
```



```
 >>>>>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) =      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      Fp         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"          B       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 AREA(ACRES) =   29.70      SUBAREA RUNOFF(CFS) =   10.34
 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
```

```
 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        9.75      0.75     0.900    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        0.37      0.75     0.600    56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        7.31      0.75     0.700    56
 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) =    3.93
 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) =      53.04
 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  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) =      53.85
   ***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.) =    4.85
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.89
 STREET FLOW TRAVEL TIME(MIN.) =   2.65   Tc(MIN.) =   56.20
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.832
 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        1.23      0.75     0.600    56
 RESIDENTIAL
 ".4 DWELLING/ACRE"         B        0.24      0.75     0.900    56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        4.18      0.75     0.700    56
```



```
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.687
 SUBAREA AREA(ACRES) =    5.65      SUBAREA RUNOFF(CFS) =    1.62
 EFFECTIVE AREA(ACRES) =    172.49    AREA-AVERAGED Fm(INCH/HR) =  0.53
 AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.71
 TOTAL AREA(ACRES) =      172.5       PEAK FLOW RATE(CFS) =      53.04
 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) = 0.59   HALFSTREET FLOOD WIDTH(FEET) =  22.65
 FLOW VELOCITY(FEET/SEC.) =  4.82   DEPTH*VELOCITY(FT*FT/SEC.) =   2.86
 LONGEST FLOWPATH FROM NODE  20360.00 TO NODE  20371.00 =    8120.76 FEET.

****************************************************************************
 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)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1845.00  DOWNSTREAM ELEVATION(FEET) = 1825.00
 STREET LENGTH(FEET) =   580.50   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) =      58.33
   ***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.) =    6.07
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.41
 STREET FLOW TRAVEL TIME(MIN.) =   1.59   Tc(MIN.) =   57.79
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.818
 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        3.05      0.75     0.600    56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B       36.06      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) =   39.11      SUBAREA RUNOFF(CFS) =   10.58
 EFFECTIVE AREA(ACRES) =    211.60    AREA-AVERAGED Fm(INCH/HR) =  0.52
 AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.70
 TOTAL AREA(ACRES) =      211.6       PEAK FLOW RATE(CFS) =      56.02
```

```
  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) = 0.56   HALFSTREET FLOOD WIDTH(FEET) =  20.76
  FLOW VELOCITY(FEET/SEC.) =  5.99   DEPTH*VELOCITY(FT*FT/SEC.) =   3.33
  *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  20372.00 TO NODE  20373.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 18 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1825.00  DOWNSTREAM ELEVATION(FEET) = 1770.00
  STREET LENGTH(FEET) =  1298.78   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) =   0.77

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      62.19
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.60
    HALFSTREET FLOOD WIDTH(FEET) =   21.93
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.22
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.71
  STREET FLOW TRAVEL TIME(MIN.) =   3.48   Tc(MIN.) =   61.27
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.790
  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        6.56      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       75.29      0.75     0.900    56
  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) =   12.31
  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) =      62.95

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43
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  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.60   HALFSTREET FLOOD WIDTH(FEET) =  22.04
  FLOW VELOCITY(FEET/SEC.) =  6.23   DEPTH*VELOCITY(FT*FT/SEC.) =   3.73
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1298.8 FT WITH ELEVATION-DROP =  55.0 FT, IS  107.7 CFS,
         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.

****************************************************************************
  FLOW PROCESS FROM NODE  20373.00 TO NODE  20374.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>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) =      66.87
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.62
    HALFSTREET FLOOD WIDTH(FEET) =   23.10
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.05
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.75
  STREET FLOW TRAVEL TIME(MIN.) =   3.67   Tc(MIN.) =   64.94
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.763
  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        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) =    7.81
  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) =      63.35

  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) =  22.63
  FLOW VELOCITY(FEET/SEC.) =  5.96   DEPTH*VELOCITY(FT*FT/SEC.) =   3.64
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
```

```
        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) =      66.81
    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      Fp         Ap     SCS
       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
  * 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) =      64.15

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.43; 6HR = 2.06; 24HR = 4.43

  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.
```



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****************************************************************************
  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      Fp         Ap     SCS
       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"         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
  * 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.

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  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.) =   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 **
  STREAM      Q        Tc      AREA      HEADWATER
  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) =     4628.5
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  20376.00 =   22921.16 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) = 16.67  RUNOFF VOLUME(AF) =     658.35
  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
```

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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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                          Analysis prepared by:

                              RBF Consulting
                            14257 Alton Parkway
                                 Irvine, CA
                                   92618

 ************************* DESCRIPTION OF STUDY *************************
* REDLANDS MPD  - UPDATE                                                 *
* 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:
============================================================================
                    --*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
```



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 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  20400.00 TO NODE  20401.00 IS CODE =  21
 ----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   924.07
  ELEVATION DATA: UPSTREAM(FEET) =   1720.00  DOWNSTREAM(FEET) =   1670.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.338
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.174
  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
  ".4 DWELLING/ACRE"         B        0.14      0.75     0.900    56   13.40
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       10.27      0.75     0.600    56   11.34
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.604
  SUBAREA RUNOFF(CFS) =     16.14
  TOTAL AREA(ACRES) =     10.41   PEAK FLOW RATE(CFS) =     16.14

  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  20401.00 TO NODE  20402.00 IS CODE =  63
 ----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1670.00  DOWNSTREAM ELEVATION(FEET) = 1657.00
  STREET LENGTH(FEET) =   293.15   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00
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 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  10.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =      22.35
   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         Ap     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) =      27.56

 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
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 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) =      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):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        2.76      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) =    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
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  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      Fp         Ap     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) =   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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
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 "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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 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
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  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) =      64.97
    ***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      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) =    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.
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****************************************************************************
  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) =      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         Ap     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) =   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
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 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) =      99.55
   ***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.) =    6.88
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.74
 STREET FLOW TRAVEL TIME(MIN.) =   1.21   Tc(MIN.) =   24.68
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.363
 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       51.42      0.75     0.600    56
 COMMERCIAL                 B        4.09      0.75     0.100    56
 RESIDENTIAL
 ".4 DWELLING/ACRE"         B        0.43      0.75     0.900    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.566
 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
 TOTAL AREA(ACRES) =      144.2        PEAK FLOW RATE(CFS) =     119.90

 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) = 0.72   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,
        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
 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) =     139.13
   ***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.) =    6.77
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.36
 STREET FLOW TRAVEL TIME(MIN.) =   3.38   Tc(MIN.) =   28.06
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.262
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL FAIR COVER
 "OPEN BRUSH"               B        0.01      0.61     1.000    66
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B       52.45      0.75     0.600    56
 PUBLIC PARK                B        0.03      0.75     0.850    56
 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) =   38.42
 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) =     145.19

 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) = 0.80   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.

****************************************************************************
 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) =     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 = 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
  "3-4 DWELLINGS/ACRE"       B       25.52      0.75     0.600    56
  PUBLIC PARK                B        5.30      0.75     0.850    56
  SCHOOL                     B        8.19      0.75     0.600    56
  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.
   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) =     663.95
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    1799.68
  TOTAL AREA(ACRES) =     4667.5       PEAK FLOW RATE(CFS) =    1828.74
  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

****************************************************************************
  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)     Ap     Ae     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)<<<<<
============================================================================
```

```
  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) =    1877.19
  FLOW VELOCITY(FEET/SEC.) =  24.63   FLOW DEPTH(FEET) =   3.86
  TRAVEL TIME(MIN.) =   0.90   Tc(MIN.) =   49.71
  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.) =   49.71
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.896
  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       25.77      0.75     0.600    56
  PUBLIC PARK                B        1.54      0.75     0.850    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.79      0.61     1.000    66
  COMMERCIAL                 B        0.05      0.75     0.100    56
  MOBILE HOME PARK           B        5.02      0.75     0.250    56
  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= 0.30;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%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.83; LAG(HR) = 0.66; 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) =     4897.4
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  20452.00 =   27096.44 FEET.
   EQUIVALENT 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
  TIME OF PEAK FLOW(HR) = 16.67  RUNOFF VOLUME(AF) =     699.86
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    1856.44
  TOTAL AREA(ACRES) =     4897.4       PEAK FLOW RATE(CFS) =    1877.19
  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 = 1.92; 24HR = 3.88

****************************************************************************
  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

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.027
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.211
  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
  "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) =      8.48
  TOTAL AREA(ACRES) =      4.91   PEAK FLOW RATE(CFS) =      8.48

  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  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
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.945
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           A        2.50      0.98     0.250    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        0.99      0.98     0.600    32
  COMMERCIAL                 A        2.87      0.98     0.100    32
  COMMERCIAL                 B        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) =     16.28
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.10
  AVERAGE FLOW DEPTH(FEET) =   0.56   FLOOD WIDTH(FEET) =   28.02
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   2.62   Tc(MIN.) =   13.65
  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) =      22.95

  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 "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.61   FLOOD WIDTH(FEET) =   33.39
  FLOW VELOCITY(FEET/SEC.) =   4.27   DEPTH*VELOCITY(FT*FT/SEC) =   2.60
  LONGEST FLOWPATH FROM NODE  20420.00 TO NODE  20422.00 =    1218.93 FEET.

****************************************************************************
  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) =      28.57
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.48
    HALFSTREET FLOOD WIDTH(FEET) =   16.02
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.18
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.48
  STREET FLOW TRAVEL TIME(MIN.) =   0.96   Tc(MIN.) =   14.61
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.867
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           A        2.62      0.98     0.250    32
  SCHOOL                     A        0.15      0.98     0.600    32
  COMMERCIAL                 A        1.21      0.98     0.100    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.63      0.75     0.600    56
  COMMERCIAL                 B        2.01      0.75     0.100    56
  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) =   11.25
  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) =      33.14

  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) = 0.50   HALFSTREET FLOOD WIDTH(FEET) =  16.96
  FLOW VELOCITY(FEET/SEC.) =  5.40   DEPTH*VELOCITY(FT*FT/SEC.) =   2.69
  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<<<<<
  >>>>>(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) = 32.00

  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) =      36.96
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.53
    HALFSTREET FLOOD WIDTH(FEET) =   18.52
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.10
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.70
  STREET 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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           A        0.47      0.98     0.250    32
  MOBILE HOME PARK           B        0.58      0.75     0.250    56
  COMMERCIAL                 B        2.83      0.75     0.100    56
  COMMERCIAL                 A        0.03      0.98     0.100    32
  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) =    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 = 3.88

  END 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)<<<<<
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==========================================================================
  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

  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) =      41.77
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.55
    HALFSTREET FLOOD WIDTH(FEET) =   19.38
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.29
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.89
  STREET FLOW TRAVEL TIME(MIN.) =   0.62   Tc(MIN.) =   16.07
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.763
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        0.06      0.75     0.250    56
  COMMERCIAL                 B        1.63      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.63      0.75     0.600    56
  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) =    4.49
  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) =      42.95

  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) =  19.62
  FLOW VELOCITY(FEET/SEC.) =  5.32   DEPTH*VELOCITY(FT*FT/SEC.) =   2.93
  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
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.587
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  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        1.17      0.75     0.600    56
  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) =     48.16
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.51
  AVERAGE FLOW DEPTH(FEET) =   0.74   FLOOD WIDTH(FEET) =   48.63
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   3.09   Tc(MIN.) =   19.16
  SUBAREA AREA(ACRES) =    9.56      SUBAREA RUNOFF(CFS) =   10.44
  EFFECTIVE AREA(ACRES) =   40.94     AREA-AVERAGED Fm(INCH/HR) =   0.27
  AREA-AVERAGED Fp(INCH/HR) =   0.87  AREA-AVERAGED Ap =   0.31
  TOTAL AREA(ACRES) =       40.9         PEAK FLOW RATE(CFS) =      48.40

  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 "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.74   FLOOD WIDTH(FEET) =   48.78
  FLOW VELOCITY(FEET/SEC.) =   4.50   DEPTH*VELOCITY(FT*FT/SEC) =   3.33
  LONGEST FLOWPATH FROM NODE  20420.00 TO NODE  20426.00 =    2808.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20426.00 TO NODE  20427.00 IS CODE =  92
----------------------------------------------------------------------------
  >>>>>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
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.547
  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"       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) =     52.37
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.30
  AVERAGE FLOW DEPTH(FEET) =   0.69   FLOOD WIDTH(FEET) =   42.50
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.82   Tc(MIN.) =   19.98
  SUBAREA AREA(ACRES) =    8.26      SUBAREA RUNOFF(CFS) =    7.93
  EFFECTIVE AREA(ACRES) =   49.20     AREA-AVERAGED Fm(INCH/HR) =   0.31
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  AREA-AVERAGED Fp(INCH/HR) =   0.89  AREA-AVERAGED Ap =   0.34
  TOTAL AREA(ACRES) =       49.2         PEAK FLOW RATE(CFS) =      54.87

  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 "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.69   FLOOD WIDTH(FEET) =   43.40
  FLOW VELOCITY(FEET/SEC.) =   6.35   DEPTH*VELOCITY(FT*FT/SEC) =   4.40
  LONGEST FLOWPATH FROM NODE  20420.00 TO NODE  20427.00 =    3120.11 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20427.00 TO NODE  20428.00 IS CODE =  92
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  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
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.511
  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
  "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) =     59.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.23
  AVERAGE FLOW DEPTH(FEET) =   0.71   FLOOD WIDTH(FEET) =   45.64
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.80   Tc(MIN.) =   20.79
  SUBAREA AREA(ACRES) =    8.95       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
  TOTAL AREA(ACRES) =       58.1         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 = 3.88

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.72   FLOOD WIDTH(FEET) =   46.54
  FLOW VELOCITY(FEET/SEC.) =   6.28   DEPTH*VELOCITY(FT*FT/SEC) =   4.52
  LONGEST FLOWPATH FROM NODE  20420.00 TO NODE  20428.00 =    3421.05 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20428.00 TO NODE  20429.00 IS CODE =  92
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =   1668.00
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  DOWNSTREAM NODE ELEVATION(FEET) =   1664.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   362.52
  "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) =  1.456
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A        0.97      0.98     0.100    32
  RESIDENTIAL
  "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) =     69.97
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.52
  AVERAGE FLOW DEPTH(FEET) =   0.83   FLOOD WIDTH(FEET) =   59.08
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.34   Tc(MIN.) =   22.13
  SUBAREA AREA(ACRES) =   18.97       SUBAREA RUNOFF(CFS) =   16.39
  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) =      75.27

  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 "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.84   FLOOD WIDTH(FEET) =   60.88
  FLOW VELOCITY(FEET/SEC.) =   4.59   DEPTH*VELOCITY(FT*FT/SEC) =   3.87
  LONGEST FLOWPATH FROM NODE  20420.00 TO NODE  20429.00 =    3783.57 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20429.00 TO NODE  20430.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      94.14
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
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    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A       21.36      0.98     0.600    32
  COMMERCIAL                 A        7.94      0.98     0.100    32
  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.

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  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
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  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    32
  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 Tc :
  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
```

```
  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 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
  "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
```



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    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        6.59      0.75     0.600    56
```

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  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) =      16.77

  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) =      20.01
    ***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      Fp         Ap     SCS
       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
```



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  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         Ap     SCS
       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.
```

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****************************************************************************
  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) =      36.26
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.80
    HALFSTREET FLOOD WIDTH(FEET) =   33.09
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.60
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.28
  STREET FLOW TRAVEL TIME(MIN.) =   8.22   Tc(MIN.) =   35.04
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.105
  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       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) =   13.10
  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) =      36.06

  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) = 0.80   HALFSTREET FLOOD WIDTH(FEET) =  33.03
  FLOW VELOCITY(FEET/SEC.) =  1.60   DEPTH*VELOCITY(FT*FT/SEC.) =   1.28
  *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
  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)<<<<<
============================================================================
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  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
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      43.05
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.56
    HALFSTREET FLOOD WIDTH(FEET) =   20.17
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.06
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.84
  STREET FLOW TRAVEL TIME(MIN.) =   3.17   Tc(MIN.) =   38.21
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.049
  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        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                     B        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 AREA(ACRES) =   31.80      SUBAREA RUNOFF(CFS) =   13.96
  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) =      46.94

  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) = 0.58   HALFSTREET FLOOD WIDTH(FEET) =  20.87
  FLOW VELOCITY(FEET/SEC.) =  5.16   DEPTH*VELOCITY(FT*FT/SEC.) =   2.97
  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) = 26.00

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =      57.66
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.62
   HALFSTREET FLOOD WIDTH(FEET) =   23.04
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.24
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.25
 STREET FLOW TRAVEL TIME(MIN.) =   2.79   Tc(MIN.) =   41.00
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.005
 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        9.63      0.98     0.600    32
 COMMERCIAL                 A       12.07      0.98     0.100    32
 COMMERCIAL                 B        0.31      0.75     0.100    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        2.23      0.75     0.600    56
 SCHOOL                     B       11.63      0.75     0.600    56
 SCHOOL                     A        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) =   21.44
 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) =      64.76

 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) = 0.64   HALFSTREET FLOOD WIDTH(FEET) =  24.10
 FLOW VELOCITY(FEET/SEC.) =  5.40   DEPTH*VELOCITY(FT*FT/SEC.) =   3.46
 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
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 Manning's FRICTION FACTOR for Streetflow Section(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) =      73.05
   ***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.) =    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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 A        3.48      0.98     0.100    32
 COMMERCIAL                 B        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                     A        0.64      0.98     0.600    32
 SCHOOL                     B       16.30      0.75     0.600    56
 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.) =   43.61
 RAINFALL INTENSITY(INCH/HR) =   0.97
 AREA-AVERAGED Fm(INCH/HR) =  0.43
 AREA-AVERAGED Fp(INCH/HR) =  0.81
 AREA-AVERAGED Ap =  0.53
 EFFECTIVE STREAM AREA(ACRES) =     159.38
 TOTAL STREAM AREA(ACRES) =     159.38
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      77.06

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```

```
 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
    2       77.06   43.61    0.969  0.81( 0.43) 0.53     159.4   20440.00

  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      181.33   30.91    1.191  0.87( 0.39) 0.45     245.2   20420.00
      2      153.58   43.61    0.969  0.86( 0.40) 0.46     291.6   20440.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     181.33    Tc(MIN.) =    30.91
  EFFECTIVE AREA(ACRES) =     245.19   AREA-AVERAGED Fm(INCH/HR) =  0.39
  AREA-AVERAGED Fp(INCH/HR) =  0.87  AREA-AVERAGED Ap =  0.45
  TOTAL AREA(ACRES) =      291.6
  LONGEST FLOWPATH FROM NODE  20420.00 TO NODE  20449.00 =    6496.83 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20449.00 TO NODE  20450.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 18 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1625.00  DOWNSTREAM ELEVATION(FEET) = 1595.00
  STREET LENGTH(FEET) =  1304.02   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) =   0.89

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     222.00
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.93
    HALFSTREET FLOOD WIDTH(FEET) =   39.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.35
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.81
  STREET FLOW TRAVEL TIME(MIN.) =   2.96   Tc(MIN.) =   33.87
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.127
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       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
  COMMERCIAL                B       19.61      0.75     0.100    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                B        9.23      0.63     1.000    65
  RESIDENTIAL
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  "3-4 DWELLINGS/ACRE"      B        8.18      0.75     0.600    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"      A        7.04      0.98     0.600    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.77
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.292
  SUBAREA AREA(ACRES) =  100.18      SUBAREA RUNOFF(CFS) =   81.36
  EFFECTIVE AREA(ACRES) =    345.37    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) =     243.90

  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) = 0.95   HALFSTREET FLOOD WIDTH(FEET) =  40.34
  FLOW VELOCITY(FEET/SEC.) =  7.55   DEPTH*VELOCITY(FT*FT/SEC.) =   7.19

  *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) =  30.00    NUMBER OF PIPES =   1
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.67
  PIPE-FLOW(CFS) =      57.35
  PIPEFLOW TRAVEL TIME(MIN.) =   1.86    Tc(MIN.) =  32.78
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.150
  SUBAREA AREA(ACRES) =  100.18      SUBAREA RUNOFF(CFS) =   83.38
  TOTAL AREA(ACRES) =      391.8        PEAK FLOW RATE(CFS) =     250.87

  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 Tc :
  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =  193.52
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.89
    HALFSTREET FLOOD WIDTH(FEET) =   37.11
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.08
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.30

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      250.87   32.78    1.150  0.85( 0.34) 0.40     345.4   20420.00
      2      207.96   45.61    0.943  0.85( 0.35) 0.42     391.8   20440.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     250.87  Tc(MIN.) =   32.78
  AREA-AVERAGED Fm(INCH/HR) =  0.34  AREA-AVERAGED Fp(INCH/HR) =  0.85
  AREA-AVERAGED Ap =  0.40  EFFECTIVE AREA(ACRES) =     345.37
  LONGEST FLOWPATH FROM NODE  20420.00 TO NODE  20450.00 =    7800.85 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) =     250.87
  FLOW VELOCITY(FEET/SEC.) =   8.44   FLOW DEPTH(FEET) =   2.10
  TRAVEL TIME(MIN.) =   5.77   Tc(MIN.) =   38.55
  LONGEST FLOWPATH FROM NODE  20420.00 TO NODE  20451.00 =   10722.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20451.00 TO NODE  20451.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   38.55
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.043
  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       19.78      0.75     0.600    56
  COMMERCIAL                 B        5.95      0.75     0.100    56
  MOBILE HOME PARK           B        6.72      0.75     0.250    56
  PUBLIC PARK                B        6.76      0.75     0.850    56
  SCHOOL                     B        5.51      0.75     0.600    56
  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) =   26.37
  EFFECTIVE AREA(ACRES) =    390.09   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) =     250.87
  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  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) =     250.87
  FLOW VELOCITY(FEET/SEC.) =   7.47   FLOW DEPTH(FEET) =   2.30
  TRAVEL TIME(MIN.) =   2.84   Tc(MIN.) =   41.39
  LONGEST FLOWPATH FROM NODE  20420.00 TO NODE  20452.00 =   11995.84 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20452.00 TO NODE  20452.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   41.39
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.000
```



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  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        6.50      0.75     0.600    56
  COMMERCIAL                 B        3.31      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        0.25      0.98     0.600    32
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.07      0.61     1.000    66
  PUBLIC PARK                B        0.12      0.75     0.850    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.444
  SUBAREA AREA(ACRES) =   10.25      SUBAREA RUNOFF(CFS) =    6.13
  EFFECTIVE AREA(ACRES) =    400.34   AREA-AVERAGED Fm(INCH/HR) =  0.40
  AREA-AVERAGED Fp(INCH/HR) =  0.83  AREA-AVERAGED Ap =  0.48
  TOTAL AREA(ACRES) =      446.7       PEAK FLOW RATE(CFS) =     250.87
  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  20452.00 TO NODE  20452.00 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      250.87   41.39    1.000  0.83( 0.35) 0.42     400.3   20420.00
      2      207.96   54.73    0.845  0.83( 0.36) 0.43     446.7   20440.00
  LONGEST FLOWPATH FROM NODE  20420.00 TO NODE  20452.00 =   11995.84 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  PEAK FLOW RATE(CFS) =     1877.19    Tc(MIN.) =   49.71
  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.

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.82;3H= 1.47;6H= 2.15;24H= 4.50
  S-GRAPH: VALLEY(DEV.)= 49.2%;VALLEY(UNDEV.)/DESERT= 50.8%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.83; LAG(HR) = 0.66; Fm(INCH/HR) = 0.56; Ybar = 0.63
  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) =     5344.1
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  20452.00 =   27096.44 FEET.
   EQUIVALENT 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
  TIME OF PEAK FLOW(HR) = 16.67  RUNOFF VOLUME(AF) =     784.44
  PEAK FLOW RATE(CFS) =    2044.74

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 FLOW PROCESS FROM NODE  20452.00 TO NODE  20452.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE  20452.00 TO NODE  20453.00 IS CODE =  54
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   1510.00  DOWNSTREAM(FEET) =   1440.00
 CHANNEL LENGTH THRU SUBAREA(FEET) =  3395.49   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) =    2044.74
 FLOW VELOCITY(FEET/SEC.) =  26.89   FLOW DEPTH(FEET) =   3.86
 TRAVEL TIME(MIN.) =   2.10   Tc(MIN.) =   51.82
 LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  20453.00 =   30491.93 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  20453.00 TO NODE  20453.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   51.82
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.874
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 MOBILE HOME PARK           B       20.13      0.75     0.250    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B       19.32      0.75     0.600    56
 SCHOOL                     B        8.94      0.75     0.600    56
 COMMERCIAL                 B        4.10      0.75     0.100    56
 PUBLIC PARK                B        1.64      0.75     0.850    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A        0.19      0.98     0.600    32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.440
 SUBAREA AREA(ACRES) =   54.32
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.82;3H= 1.47;6H= 2.15;24H= 4.50
 S-GRAPH: VALLEY(DEV.)= 49.7%;VALLEY(UNDEV.)/DESERT= 50.3%
          MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
 Tc(HR) = 0.86; LAG(HR) = 0.69; Fm(INCH/HR) = 0.56; Ybar = 0.63
 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) =     5398.4
 LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  20453.00 =   30491.93 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) = 16.75  RUNOFF VOLUME(AF) =     795.02
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    2025.04
 TOTAL AREA(ACRES) =     5398.4       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

****************************************************************************
 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 SCHOOL                     B       17.44      0.75     0.600    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        3.70      0.75     0.600    56
 PUBLIC PARK                B        9.17      0.75     0.850    56
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"       B        5.37      0.75     0.500    56
 COMMERCIAL                 B        1.64      0.75     0.100    56
 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.
  EQUIVALENT 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
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  20454.00 TO NODE  20454.00 IS CODE = 152
----------------------------------------------------------------------------
  >>>>>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.) =     54.02
  AREA-AVERAGED Fm(INCH/HR)=  0.55   Ybar =  0.62
  PEAK FLOW RATE(CFS)   =   2044.74
============================================================================
============================================================================
  END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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             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 20539                     *
* 10-YR  HC ULTIMATE CONDITION    OCT 2013   DMALOTT                    *
 ************************************************************************

  FILE NAME: LR0205ZZ.DAT
  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

  *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 0.0313 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
```



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 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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   15.525
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.800
  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
  "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
  "ORCHARDS"                 A        0.12      0.88      1.000    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) =      4.65

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90

************************************************************************
  FLOW PROCESS FROM NODE  20501.00 TO NODE  20502.00 IS CODE =  63
------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
========================================================================
  UPSTREAM ELEVATION(FEET) = 1591.00  DOWNSTREAM ELEVATION(FEET) = 1587.00
```

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 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 =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =       6.73
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.35
   HALFSTREET FLOOD WIDTH(FEET) =   11.16
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.47
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.86
 STREET FLOW TRAVEL TIME(MIN.) =   1.77   Tc(MIN.) =   17.30
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.687
 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        3.30      0.75     0.600    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A        0.37      0.98     0.600    32
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 A        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) =    4.16
 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) =       8.41

 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) = 0.37   HALFSTREET FLOOD WIDTH(FEET) =  12.26
 FLOW VELOCITY(FEET/SEC.) =  2.59   DEPTH*VELOCITY(FT*FT/SEC.) =   0.96
 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
----------------------------------------------------------------------------
 >>>>>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
 STREET HALFWIDTH(FEET) = 18.00

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



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 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =      11.04
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.38
   HALFSTREET FLOOD WIDTH(FEET) =   12.57
   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
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.604
 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        2.45      0.75     0.600    56
 MOBILE HOME PARK           B        1.73      0.75     0.250    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A        0.21      0.98     0.600    32
 MOBILE HOME PARK           A        0.20      0.98     0.250    32
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 A        0.11      0.88     1.000    44
 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) =    5.26
 EFFECTIVE AREA(ACRES) =     12.48    AREA-AVERAGED Fm(INCH/HR) =  0.44
 AREA-AVERAGED Fp(INCH/HR) =  0.79  AREA-AVERAGED Ap =  0.56
 TOTAL AREA(ACRES) =       12.5        PEAK FLOW RATE(CFS) =      13.09

 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) = 0.39   HALFSTREET FLOOD WIDTH(FEET) =  13.43
 FLOW VELOCITY(FEET/SEC.) =  3.41   DEPTH*VELOCITY(FT*FT/SEC.) =   1.34
 LONGEST FLOWPATH FROM NODE  20500.00 TO NODE  20503.00 =    1231.69 FEET.

****************************************************************************
 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)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1580.00  DOWNSTREAM ELEVATION(FEET) = 1570.00
 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
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0180
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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.28      0.75     0.600    56
  MOBILE HOME PARK           B        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
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    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      Fp         Ap     SCS
       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) =    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       14.33      0.75     0.600    56
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  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) =      34.00

  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) =      38.85
    ***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      Fp         Ap     SCS
       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    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
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  TOTAL AREA(ACRES) =       60.1        PEAK FLOW RATE(CFS) =      39.98

  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.

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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "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) =    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
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  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) =      43.48
    ***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      Fp         Ap     SCS
       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
  * 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
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  >>>>>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) =      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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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
  * 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
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  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      Fp         Ap     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
  "ORCHARDS"                 A        0.98      0.88     1.000    44   23.01
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.57      0.75     0.600    56   13.43
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        1.82      0.63     1.000    65   23.01
  COMMERCIAL                 B        0.06      0.75     0.100    56    9.91
  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
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    **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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 A        1.59      0.88     1.000    44
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        2.00      0.63     1.000    65
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.46      0.75     0.600    56
  MOBILE HOME PARK           B        0.58      0.75     0.250    56
  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) =      11.70

  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
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  AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.16
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.50
STREET FLOW TRAVEL TIME(MIN.) =   1.61   Tc(MIN.) =   12.61
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.040
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        1.37      0.88     1.000    44
MOBILE HOME PARK           A        1.25      0.98     0.250    32
AGRICULTURAL FAIR COVER
"ORCHARDS"                 B        1.07      0.63     1.000    65
MOBILE HOME PARK           B        2.91      0.75     0.250    56
RESIDENTIAL
"3-4 DWELLINGS/ACRE"       B        0.58      0.75     0.600    56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.78
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.533
SUBAREA AREA(ACRES) =    7.18      SUBAREA RUNOFF(CFS) =   10.49
EFFECTIVE AREA(ACRES) =     15.48    AREA-AVERAGED Fm(INCH/HR) =  0.54
AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.72
TOTAL AREA(ACRES) =       15.5        PEAK FLOW RATE(CFS) =      20.89

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) = 0.50   HALFSTREET FLOOD WIDTH(FEET) =  17.18
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.

****************************************************************************
FLOW PROCESS FROM NODE  20513.00 TO NODE  20514.00 IS CODE =  63
----------------------------------------------------------------------------
>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STREET TABLE SECTION # 18 USED)<<<<<
============================================================================
UPSTREAM ELEVATION(FEET) = 1575.00  DOWNSTREAM ELEVATION(FEET) = 1570.00
STREET LENGTH(FEET) =   416.53   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) =   1.06

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      28.96
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.57
  HALFSTREET FLOOD WIDTH(FEET) =   20.81
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.20
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.84
STREET FLOW TRAVEL TIME(MIN.) =   2.17   Tc(MIN.) =   14.77
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.855
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SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
MOBILE HOME PARK           A        3.78      0.98     0.250    32
MOBILE HOME PARK           B        6.42      0.75     0.250    56
RESIDENTIAL
"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) =   16.15
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) =      34.46

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) = 0.60   HALFSTREET FLOOD WIDTH(FEET) =  22.28
FLOW VELOCITY(FEET/SEC.) =  3.34   DEPTH*VELOCITY(FT*FT/SEC.) =   2.02
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) =   392.53   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) =      41.51
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.63
  HALFSTREET FLOOD WIDTH(FEET) =   23.69
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.58
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.26
STREET FLOW TRAVEL TIME(MIN.) =   1.83   Tc(MIN.) =   16.60
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.729
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
MOBILE HOME PARK           B        5.83      0.75     0.250    56
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
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  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.408
  SUBAREA AREA(ACRES) =   11.01      SUBAREA RUNOFF(CFS) =   14.10
  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) =      45.57

  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) = 0.65   HALFSTREET FLOOD WIDTH(FEET) =  24.56
  FLOW VELOCITY(FEET/SEC.) =  3.66   DEPTH*VELOCITY(FT*FT/SEC.) =   2.38
  LONGEST FLOWPATH FROM NODE  20510.00 TO NODE  20515.00 =    1933.74 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) =      63.98
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.64
    HALFSTREET FLOOD WIDTH(FEET) =   23.92
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.41
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.44
  STREET FLOW TRAVEL TIME(MIN.) =   3.74   Tc(MIN.) =   20.35
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.531
  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       20.48      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) =   36.75
  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) =      75.61

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
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  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) = 0.67   HALFSTREET FLOOD WIDTH(FEET) =  25.58
  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.

****************************************************************************
  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

  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) =      88.74
    ***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.) =    5.11
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.78
  STREET FLOW TRAVEL TIME(MIN.) =   3.64   Tc(MIN.) =   23.98
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.387
  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       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) =   26.17
  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) =      92.38

  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) = 0.75   HALFSTREET FLOOD WIDTH(FEET) =  30.03
  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.
```

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****************************************************************************
  FLOW PROCESS FROM NODE  20517.00 TO NODE  20518.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 18 USED)<<<<<
============================================================================
  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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =     105.30
    ***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.) =    5.13
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.05
  STREET FLOW TRAVEL TIME(MIN.) =   4.36   Tc(MIN.) =   28.34
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.255
  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
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.600
  SUBAREA AREA(ACRES) =   41.95      SUBAREA RUNOFF(CFS) =   25.79
  EFFECTIVE AREA(ACRES) =    148.93    AREA-AVERAGED Fm(INCH/HR) =  0.47
  AREA-AVERAGED Fp(INCH/HR) =  0.86  AREA-AVERAGED Ap =  0.55
  TOTAL AREA(ACRES) =      148.9        PEAK FLOW RATE(CFS) =     105.44

  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) = 0.79   HALFSTREET FLOOD WIDTH(FEET) =  32.28
  FLOW VELOCITY(FEET/SEC.) =  5.11   DEPTH*VELOCITY(FT*FT/SEC.) =   4.05
  LONGEST FLOWPATH FROM NODE  20510.00 TO NODE  20518.00 =    5604.37 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20518.00 TO NODE  20518.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
```



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  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   28.34
  RAINFALL INTENSITY(INCH/HR) =   1.25
  AREA-AVERAGED Fm(INCH/HR) =  0.47
  AREA-AVERAGED Fp(INCH/HR) =  0.86
  AREA-AVERAGED Ap =  0.55
  EFFECTIVE STREAM AREA(ACRES) =     148.93
  TOTAL STREAM AREA(ACRES) =     148.93
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     105.44

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       43.07   52.25    0.869  0.83( 0.47) 0.56      82.8   20500.00
      2      105.44   28.34    1.255  0.86( 0.47) 0.55     148.9   20510.00

  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      148.51   28.34    1.255  0.85( 0.47) 0.55     193.8   20510.00
      2       96.85   52.25    0.869  0.85( 0.47) 0.55     231.7   20500.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     148.51    Tc(MIN.) =    28.34
  EFFECTIVE AREA(ACRES) =     193.83   AREA-AVERAGED Fm(INCH/HR) =  0.47
  AREA-AVERAGED Fp(INCH/HR) =  0.85  AREA-AVERAGED Ap =  0.55
  TOTAL AREA(ACRES) =      231.7
  LONGEST FLOWPATH FROM NODE  20500.00 TO NODE  20518.00 =    7021.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20518.00 TO NODE  20519.00 IS CODE =  33
----------------------------------------------------------------------------
  >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1489.50
  DOWNSTREAM NODE ELEVATION(FEET) =  1440.00
  FLOW LENGTH(FEET) =  2632.61   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  27.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.35
  PIPE-FLOW(CFS) =     148.51
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   2.69    Tc(MIN.) =  31.03
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.188
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  SCHOOL                     A       21.65      0.98     0.600    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A       27.03      0.98     0.600    32
  MOBILE HOME PARK           A        8.46      0.98     0.250    32
  SCHOOL                     B        7.51      0.75     0.600    56
  RESIDENTIAL
```

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"3-4 DWELLINGS/ACRE"       B        5.29      0.75     0.600    56
MOBILE HOME PARK           B        2.31      0.75     0.250    56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.93
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.548
SUBAREA AREA(ACRES) =   72.25      SUBAREA RUNOFF(CFS) =   44.23
EFFECTIVE AREA(ACRES) =    266.08    AREA-AVERAGED Fm(INCH/HR) =  0.48
AREA-AVERAGED Fp(INCH/HR) =  0.87  AREA-AVERAGED Ap =  0.55
TOTAL AREA(ACRES) =      304.0        PEAK FLOW RATE(CFS) =     169.97

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
STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =   21.46
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.50
  HALFSTREET FLOOD WIDTH(FEET) =   16.89
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.53
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.75

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
    1      169.97   31.03    1.188  0.87( 0.48) 0.55     266.1   20510.00
    2      103.37   55.25    0.841  0.87( 0.48) 0.55     304.0   20500.00
NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) =     169.97  Tc(MIN.) =   31.03
AREA-AVERAGED Fm(INCH/HR) =  0.48  AREA-AVERAGED Fp(INCH/HR) =  0.87
AREA-AVERAGED Ap =  0.55  EFFECTIVE AREA(ACRES) =     266.08
LONGEST FLOWPATH FROM NODE  20500.00 TO NODE  20519.00 =    9653.93 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  20519.00 TO NODE  20520.00 IS CODE =  33
----------------------------------------------------------------------------
>>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
>>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
UPSTREAM NODE ELEVATION(FEET) =  1440.00
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
DEPTH OF FLOW IN  66.0 INCH PIPE IS  27.5 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =  18.10
PIPE-FLOW(CFS) =     169.97
*NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
PIPEFLOW TRAVEL TIME(MIN.) =   1.52    Tc(MIN.) =  32.55
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.155
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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       13.85      0.98     0.600    32
SCHOOL                     A       16.29      0.98     0.600    32
RESIDENTIAL
"3-4 DWELLINGS/ACRE"       B       15.89      0.75     0.600    56
PUBLIC PARK                B        9.87      0.75     0.850    56
SCHOOL                     B       12.11      0.75     0.600    56
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) =   37.85
EFFECTIVE AREA(ACRES) =    334.09    AREA-AVERAGED Fm(INCH/HR) =  0.49
AREA-AVERAGED Fp(INCH/HR) =  0.87  AREA-AVERAGED Ap =  0.57
TOTAL AREA(ACRES) =      372.0        PEAK FLOW RATE(CFS) =     199.79

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90

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) =   29.82
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.54
  HALFSTREET FLOOD WIDTH(FEET) =   19.17
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.86
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.09

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
    1      199.79   32.55    1.155  0.87( 0.49) 0.57     334.1   20510.00
    2      119.84   56.99    0.825  0.86( 0.49) 0.57     372.0   20500.00
NEW PEAK FLOW DATA ARE:
PEAK FLOW RATE(CFS) =     199.79  Tc(MIN.) =   32.55
AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.87
AREA-AVERAGED Ap =  0.57  EFFECTIVE AREA(ACRES) =     334.09
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<<<<<
>>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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        3.22      0.98     0.600    32
  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

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```



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  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
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.872
  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
  "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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A       21.08      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) =   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) =      22.38

  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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) =      34.36
    ***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         Ap     SCS
       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
```

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  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) =      56.61
    ***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      Fp         Ap     SCS
       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) =      54.79

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.90

  END OF SUBAREA STREET FLOW HYDRAULICS:
```



```
  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 Tc :
  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) =      61.79
  *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      Fp         Ap     SCS
       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) =    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
```

```
  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.

****************************************************************************
  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.) =   33.89
  RAINFALL INTENSITY(INCH/HR) =   1.13
  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 =      61.79

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      199.79   33.64    1.132  0.87( 0.49) 0.57     339.7   20510.00
      1      119.92   58.24    0.814  0.86( 0.49) 0.57     377.5   20500.00
      2       61.79   33.89    1.127  0.97( 0.58) 0.60     115.4   20530.00

  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      261.58   33.64    1.132  0.89( 0.51) 0.58     454.3   20510.00
      2      260.77   33.89    1.127  0.89( 0.51) 0.58     455.5   20530.00
      3      157.02   58.24    0.814  0.89( 0.51) 0.57     493.0   20500.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     261.58    Tc(MIN.) =    33.64
  EFFECTIVE AREA(ACRES) =     454.27   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.

****************************************************************************
```



```
  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)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1395.00
  DOWNSTREAM NODE ELEVATION(FEET) =  1394.50
  FLOW LENGTH(FEET) =   877.02   MANNING'S N =  0.013

  USER SPECIFIED PIPE DIAMETER(INCH) = 144.00    NUMBER OF PIPES =   1
  DEPTH OF FLOW IN 144.0 INCH PIPE IS  64.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.39
  PIPE-FLOW(CFS) =     261.58
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       13.40      0.75     0.600    56
  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) =   12.42
  EFFECTIVE AREA(ACRES) =    476.21    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) =     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

  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  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
  FLOWDEPTH IN BOX IS  2.58 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  16.92
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  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      Fp         Ap     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"       B        9.02      0.75     0.600    56
  COMMERCIAL                 B        6.87      0.75     0.100    56
  PUBLIC PARK                B        0.38      0.75     0.850    56
  SCHOOL                     B        0.45      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.428
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.02      0.75     0.600    56
```



```
  COMMERCIAL                 B        3.73      0.75     0.100    56
  PUBLIC PARK                B        1.42      0.75     0.850    56
  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
```

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  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00

        ==>>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) =   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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK                B        2.13      0.75     0.850    56
  SCHOOL                     B        8.75      0.75     0.600    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        3.67      0.75     0.600    56
  COMMERCIAL                 B        0.11      0.75     0.100    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.07      0.75     0.500    56
  MOBILE HOME PARK           B        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):
  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
----------------------------------------------------------------------------
```



```
  >>>>>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      Tc   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
      2      260.77   38.83    1.039  0.88( 0.50) 0.57     505.9   20530.00
      3      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
```

```
 ************************************************************************
             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 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:
========================================================================
                    --*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  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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.086
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.663
  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
  "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
  "OPEN BRUSH"               B        0.30      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) =     11.80
  TOTAL AREA(ACRES) =      6.12   PEAK FLOW RATE(CFS) =     11.80

  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  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) =      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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        0.68      0.75     0.700    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.18      0.75     0.500    56
  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         Ap     SCS
       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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        1.97      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.08      0.75     0.600    56
  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
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        2.05      0.75     0.700    56
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        3.11      0.75     0.700    56
```



```
  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 =  0.693
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        0.41      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 =  0.659
  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)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   2092.00  DOWNSTREAM(FEET) =   2080.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   203.75   CHANNEL SLOPE =  0.0589
  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.) =   3.65   FLOW DEPTH(FEET) =   0.61
  TRAVEL TIME(MIN.) =   0.93   Tc(MIN.) =   15.87
  LONGEST FLOWPATH FROM NODE  20600.00 TO NODE  20608.00 =    2246.18 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20608.00 TO NODE  20608.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   15.87
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.777
  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        2.94      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.31      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.656
  SUBAREA AREA(ACRES) =    5.25      SUBAREA RUNOFF(CFS) =    6.08
  EFFECTIVE AREA(ACRES) =     22.16   AREA-AVERAGED Fm(INCH/HR) =  0.51
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.69
  TOTAL AREA(ACRES) =       22.2       PEAK FLOW RATE(CFS) =      25.24

  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  20608.00 TO NODE  20609.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2080.00  DOWNSTREAM(FEET) =   2065.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   358.70   CHANNEL SLOPE =  0.0418
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  15.000
  MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   1.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      25.24
  FLOW VELOCITY(FEET/SEC.) =   3.37   FLOW DEPTH(FEET) =   0.71
  TRAVEL TIME(MIN.) =   1.77   Tc(MIN.) =   17.64
  LONGEST FLOWPATH FROM NODE  20600.00 TO NODE  20609.00 =    2604.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20609.00 TO NODE  20609.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   17.64
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.667
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
  COMMERCIAL                 B        5.77      0.75     0.100    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        7.52      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.91      0.75     0.600    56
  MOBILE HOME PARK           B        1.23      0.75     0.250    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.92      0.75     0.900    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.460
  SUBAREA AREA(ACRES) =   16.35      SUBAREA RUNOFF(CFS) =   19.47
  EFFECTIVE AREA(ACRES) =     38.51   AREA-AVERAGED Fm(INCH/HR) =  0.44
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.59
  TOTAL AREA(ACRES) =       38.5       PEAK FLOW RATE(CFS) =      42.52

  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  20609.00 TO NODE  20610.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2065.00  DOWNSTREAM ELEVATION(FEET) = 2060.00
  STREET LENGTH(FEET) =   360.92   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) =      45.85
    ***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.) =    4.11
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.45
  STREET FLOW TRAVEL TIME(MIN.) =   1.46   Tc(MIN.) =   19.11
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.590
  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        1.29      0.75     0.500    56
  COMMERCIAL                 B        2.79      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.24      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        0.95      0.75     0.700    56
  MOBILE HOME PARK           B        0.22      0.75     0.250    56
```

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  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) =      54.92
    ***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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.30      0.75     0.500    56
  COMMERCIAL                 B        1.71      0.75     0.100    56
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        1.66      0.75     0.400    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.04      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       12.96      0.75     0.700    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.604
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  SUBAREA AREA(ACRES) =   17.67      SUBAREA RUNOFF(CFS) =   16.89
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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"         B       37.07      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        6.98      0.75     0.600    56
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        0.01      0.75     0.400    56
  NATURAL FAIR COVER
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"OPEN BRUSH"                B        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) =   40.11
EFFECTIVE AREA(ACRES) =    108.57    AREA-AVERAGED Fm(INCH/HR) =  0.45
AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.61
TOTAL AREA(ACRES) =      108.6        PEAK FLOW RATE(CFS) =      96.51

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) = 0.82   HALFSTREET FLOOD WIDTH(FEET) =  34.25
FLOW VELOCITY(FEET/SEC.) =  3.99   DEPTH*VELOCITY(FT*FT/SEC.) =   3.29
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       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  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
MAXIMUM ALLOWABLE STREET FLOW DEPTH(FEET) =   0.90

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      98.67
  ***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.) =    4.62
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.61
STREET FLOW TRAVEL TIME(MIN.) =   1.32   Tc(MIN.) =   23.78
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.394
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        0.53      0.75     0.500    56
COMMERCIAL                 B        2.00      0.75     0.100    56
RESIDENTIAL
"2 DWELLINGS/ACRE"         B        1.58      0.75     0.700    56
RESIDENTIAL
"3-4 DWELLINGS/ACRE"       B        0.26      0.75     0.600    56
```



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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
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) =      96.51
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) = 0.78   HALFSTREET FLOOD WIDTH(FEET) =  31.81
FLOW VELOCITY(FEET/SEC.) =  4.60   DEPTH*VELOCITY(FT*FT/SEC.) =   3.57
LONGEST FLOWPATH FROM NODE  20600.00 TO NODE  20613.00 =    4083.00 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) =      99.13
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.83
  HALFSTREET FLOOD WIDTH(FEET) =   34.43
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.06
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.36
STREET FLOW TRAVEL TIME(MIN.) =   1.60   Tc(MIN.) =   25.38
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.340
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        0.63      0.75     0.500    56
COMMERCIAL                 B        2.36      0.75     0.100    56
RESIDENTIAL
"3-4 DWELLINGS/ACRE"       B        0.24      0.75     0.600    56
RESIDENTIAL
"2 DWELLINGS/ACRE"         B        2.47      0.75     0.700    56
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) =    5.24
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  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) =      96.51
  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) = 0.82   HALFSTREET FLOOD WIDTH(FEET) =  34.06
  FLOW VELOCITY(FEET/SEC.) =  4.03   DEPTH*VELOCITY(FT*FT/SEC.) =   3.31
  LONGEST FLOWPATH FROM NODE  20600.00 TO NODE  20614.00 =    4472.73 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) =      98.88
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.80
    HALFSTREET FLOOD WIDTH(FEET) =   33.21
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.34
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.49
  STREET FLOW TRAVEL TIME(MIN.) =   1.25   Tc(MIN.) =   26.63
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.302
  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        0.61      0.75     0.500    56
  COMMERCIAL                 B        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    56
  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) =    4.73
  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) =      96.56
```



```
  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) = 0.80   HALFSTREET FLOOD WIDTH(FEET) =  32.90
  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.

****************************************************************************
  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) =     101.02
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.86
    HALFSTREET FLOOD WIDTH(FEET) =   36.14
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.76
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.25
  STREET FLOW TRAVEL TIME(MIN.) =   1.42   Tc(MIN.) =   28.05
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.263
  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        2.51      0.75     0.500    56
  COMMERCIAL                 B        0.24      0.75     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) =    8.93
  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) =     101.03

  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) = 0.86   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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        2.43      0.75     0.500    56
  COMMERCIAL                 B        2.02      0.75     0.100    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        3.04      0.75     0.700    56
  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 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:
```



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  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      Fp         Ap     SCS   Tc
       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) =     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
```

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 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.847
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL FAIR COVER
 "OPEN BRUSH"               B        3.73      0.61     1.000    66
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        1.57      0.75     0.700    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        1.62      0.75     0.600    56
 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) =    8.05
 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) =      21.76

 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  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) =      21.76
 FLOW VELOCITY(FEET/SEC.) =   2.35   FLOW DEPTH(FEET) =   0.51
 TRAVEL TIME(MIN.) =   1.12   Tc(MIN.) =   16.00
 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.) =   16.00
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.768
 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        3.20      0.75     0.700    56
 NATURAL FAIR COVER
 "OPEN BRUSH"               B        0.56      0.61     1.000    66
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"      B        1.58      0.75     0.400    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        2.74      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) =  0.73
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.631
 SUBAREA AREA(ACRES) =    8.16      SUBAREA RUNOFF(CFS) =    9.59
```



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 EFFECTIVE AREA(ACRES) =     27.32   AREA-AVERAGED Fm(INCH/HR) =  0.55
 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         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 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"         B        1.08      0.75     0.900    56
 CONDOMINIUMS               B        0.14      0.75     0.350    56
 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
 TOTAL AREA(ACRES) =       38.2       PEAK FLOW RATE(CFS) =      39.28

 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
```

```
  MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   1.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      39.28
  FLOW VELOCITY(FEET/SEC.) =   2.69   FLOW DEPTH(FEET) =   0.65
  TRAVEL TIME(MIN.) =   2.06   Tc(MIN.) =   20.00
  LONGEST FLOWPATH FROM NODE  20620.00 TO NODE  20625.00 =    1964.97 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20625.00 TO NODE  20625.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   20.00
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.546
  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        5.47      0.75     0.600    56
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        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) =    5.58
  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) =      41.28

  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  20625.00 TO NODE  20626.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2130.00  DOWNSTREAM ELEVATION(FEET) = 2116.00
  STREET LENGTH(FEET) =   342.35   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) =   0.74

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      43.71
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.51
    HALFSTREET FLOOD WIDTH(FEET) =   18.50
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.77
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.94
  STREET FLOW TRAVEL TIME(MIN.) =   0.99   Tc(MIN.) =   20.99
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  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.502
  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        0.09      0.75     0.400    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.68      0.75     0.600    56
  MOBILE HOME PARK           B        0.24      0.75     0.250    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.04      0.75     0.900    56
  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) =    4.85
  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) =      44.39

  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) = 0.51   HALFSTREET FLOOD WIDTH(FEET) =  18.56
  FLOW VELOCITY(FEET/SEC.) =  5.82   DEPTH*VELOCITY(FT*FT/SEC.) =   2.98
  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
  STREET HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      46.13
    ***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.) =    4.15
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.47
  STREET FLOW TRAVEL TIME(MIN.) =   1.70   Tc(MIN.) =   22.70
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.434
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
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  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"         B        1.53      0.75     0.900    56
  MOBILE HOME PARK           B        0.07      0.75     0.250    56
  COMMERCIAL                 B        0.09      0.75     0.100    56
  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) =    3.48
  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) =      44.85

  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) = 0.59   HALFSTREET FLOOD WIDTH(FEET) =  22.53
  FLOW VELOCITY(FEET/SEC.) =  4.12   DEPTH*VELOCITY(FT*FT/SEC.) =   2.43
  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) =      47.17
    ***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.) =    2.67
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.93
  STREET FLOW TRAVEL TIME(MIN.) =   3.04   Tc(MIN.) =   25.74
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.329
  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        1.07      0.75     0.400    56
  RESIDENTIAL
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  ".4 DWELLING/ACRE"         B        2.66      0.75     0.900    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.65      0.75     0.600    56
  COMMERCIAL                 B        0.68      0.75     0.100    56
  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) =    4.64
  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) =      44.85
  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) = 0.71   HALFSTREET FLOOD WIDTH(FEET) =  28.57
  FLOW VELOCITY(FEET/SEC.) =  2.63   DEPTH*VELOCITY(FT*FT/SEC.) =   1.87
  LONGEST FLOWPATH FROM NODE  20620.00 TO NODE  20628.00 =    3218.91 FEET.

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  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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      46.90
    ***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.) =    4.65
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.66
  STREET FLOW TRAVEL TIME(MIN.) =   0.92   Tc(MIN.) =   26.66
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.302
  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        0.98      0.75     0.400    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.92      0.75     0.900    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        3.13      0.75     0.600    56
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  COMMERCIAL                  B        0.27      0.75     0.100    56
  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) =    4.10
  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) =      47.13

  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) =  21.67
  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  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) =      50.68
    ***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.) =    4.95
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.85
  STREET FLOW TRAVEL TIME(MIN.) =   0.94   Tc(MIN.) =   27.60
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.275
  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
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        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
  COMMERCIAL                 B        1.62      0.75     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.446
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  SUBAREA AREA(ACRES) =    8.38      SUBAREA RUNOFF(CFS) =    7.10
  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) =      52.68

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.58   HALFSTREET FLOOD WIDTH(FEET) =  22.16
  FLOW VELOCITY(FEET/SEC.) =  4.99   DEPTH*VELOCITY(FT*FT/SEC.) =   2.91
  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
  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) =      56.55
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.58
    HALFSTREET FLOOD WIDTH(FEET) =   22.16
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.36
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.12
  STREET FLOW TRAVEL TIME(MIN.) =   1.13   Tc(MIN.) =   28.72
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.245
  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
  ".4 DWELLING/ACRE"         B        0.22      0.75     0.900    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.91      0.75     0.600    56
  COMMERCIAL                 B        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) =    7.73
  EFFECTIVE AREA(ACRES) =     82.03    AREA-AVERAGED Fm(INCH/HR) =  0.45
  AREA-AVERAGED Fp(INCH/HR) =  0.71  AREA-AVERAGED Ap =  0.64
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  TOTAL AREA(ACRES) =       82.0        PEAK FLOW RATE(CFS) =      58.43

  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) = 0.59   HALFSTREET FLOOD WIDTH(FEET) =  22.41
  FLOW VELOCITY(FEET/SEC.) =  5.42   DEPTH*VELOCITY(FT*FT/SEC.) =   3.19
  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) =      61.19
    ***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.) =    5.83
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.39
  STREET FLOW TRAVEL TIME(MIN.) =   0.78   Tc(MIN.) =   29.50
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.225
  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        0.65      0.75     0.400    56
  CONDOMINIUMS               B        1.64      0.75     0.350    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        3.35      0.75     0.600    56
  COMMERCIAL                 B        1.11      0.75     0.100    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        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) =    5.53
  EFFECTIVE AREA(ACRES) =     88.94    AREA-AVERAGED Fm(INCH/HR) =  0.44
  AREA-AVERAGED Fp(INCH/HR) =  0.71  AREA-AVERAGED Ap =  0.63
  TOTAL AREA(ACRES) =       88.9        PEAK FLOW RATE(CFS) =      62.49

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
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  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) = 0.59   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) =  0.63
    HALFSTREET FLOOD WIDTH(FEET) =   24.30
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.66
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.55
  STREET 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      Fp         Ap     SCS
       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      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       20.53      0.75     0.900    56
  COMMERCIAL                 B        1.08      0.75     0.100    56
  MOBILE HOME PARK           B        0.18      0.75     0.250    56
  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:
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```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        0.22      0.75     0.400    56
  COMMERCIAL                 B        0.35      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) =    0.59
  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.
```



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****************************************************************************
  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 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
  "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) =     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
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  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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      Fp         Ap     SCS
       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) =    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
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    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.79
    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      Fp         Ap     SCS
       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) =    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        1.89      0.75     0.400    56
```

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  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.02      0.75     0.600    56
  COMMERCIAL                 B        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) =    2.49
  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) =      20.54

  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  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.) =   17.82
  RAINFALL INTENSITY(INCH/HR) =   1.66
  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 =      20.54

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       78.15   30.46    1.201  0.72( 0.47) 0.66     119.3   20620.00
      2       20.54   17.82    1.657  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       94.90   17.82    1.657  0.72( 0.45) 0.63      87.5   20640.00
      2       91.45   30.46    1.201  0.72( 0.46) 0.64     137.0   20620.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      94.90    Tc(MIN.) =    17.82
  EFFECTIVE AREA(ACRES) =      87.45   AREA-AVERAGED Fm(INCH/HR) =  0.45
  AREA-AVERAGED Fp(INCH/HR) =  0.72  AREA-AVERAGED Ap =  0.63
  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

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

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(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) =     105.03
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.65
  HALFSTREET FLOOD WIDTH(FEET) =   25.46
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.67
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.98
STREET FLOW TRAVEL TIME(MIN.) =   0.48   Tc(MIN.) =   18.30
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.631
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        0.33      0.75     0.400    56
COMMERCIAL                  B        2.57      0.75     0.100    56
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
MOBILE HOME PARK            B        0.01      0.75     0.250    56
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) =   20.27
EFFECTIVE AREA(ACRES) =    106.92    AREA-AVERAGED Fm(INCH/HR) =  0.46
AREA-AVERAGED Fp(INCH/HR) =  0.72  AREA-AVERAGED Ap =  0.63
TOTAL AREA(ACRES) =      156.4        PEAK FLOW RATE(CFS) =     113.11

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) = 0.66   HALFSTREET FLOOD WIDTH(FEET) =  26.19
FLOW VELOCITY(FEET/SEC.) =  7.83   DEPTH*VELOCITY(FT*FT/SEC.) =   5.20
** 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.) =  13.38
PIPE-FLOW(CFS) =      42.08
PIPEFLOW TRAVEL TIME(MIN.) =   0.28    Tc(MIN.) =  18.10
*  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

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) =   72.09
    ***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.) =    6.86
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.00

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      114.17   18.10    1.642  0.72( 0.46) 0.63     106.9   20640.00
      2      103.29   30.74    1.195  0.72( 0.46) 0.64     156.4   20620.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     114.17  Tc(MIN.) =   18.10
  AREA-AVERAGED Fm(INCH/HR) =  0.46  AREA-AVERAGED Fp(INCH/HR) =  0.72
  AREA-AVERAGED Ap =  0.63  EFFECTIVE AREA(ACRES) =     106.92
  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) =     124.03
    ***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.) =    8.18
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.54
  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):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        9.08      0.75     0.400    56
  COMMERCIAL                 B        5.79      0.75     0.100    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.74      0.75     0.500    56
```



```
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.22      0.75     0.900    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.302
  SUBAREA AREA(ACRES) =   15.83      SUBAREA RUNOFF(CFS) =   19.71
  EFFECTIVE AREA(ACRES) =    122.75    AREA-AVERAGED Fm(INCH/HR) =  0.62
  AREA-AVERAGED Fp(INCH/HR) =  0.72  AREA-AVERAGED Ap =  0.85
  TOTAL AREA(ACRES) =      172.3        PEAK FLOW RATE(CFS) =     114.17
  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) = 0.66   HALFSTREET FLOOD WIDTH(FEET) =  26.01
  FLOW VELOCITY(FEET/SEC.) =  8.01   DEPTH*VELOCITY(FT*FT/SEC.) =   5.29
  ** 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.) =  13.74
  PIPE-FLOW(CFS) =      43.22
  PIPEFLOW TRAVEL TIME(MIN.) =   0.37    Tc(MIN.) =  18.47
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.622
  SUBAREA AREA(ACRES) =   15.83      SUBAREA RUNOFF(CFS) =   19.90
  TOTAL AREA(ACRES) =      172.3        PEAK FLOW RATE(CFS) =     114.17
  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) =   70.95
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.57
    HALFSTREET FLOOD WIDTH(FEET) =   21.74
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.97
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.01

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      132.18   18.47    1.622  0.72( 0.43) 0.59     122.8   20640.00
      2      115.78   31.11    1.186  0.72( 0.44) 0.61     172.3   20620.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     132.18  Tc(MIN.) =   18.47
  AREA-AVERAGED Fm(INCH/HR) =  0.43  AREA-AVERAGED Fp(INCH/HR) =  0.72
  AREA-AVERAGED Ap =  0.59  EFFECTIVE AREA(ACRES) =     122.75
  LONGEST FLOWPATH FROM NODE  20620.00 TO NODE  20646.00 =    5268.81 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20646.00 TO NODE  20647.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2046.00  DOWNSTREAM(FEET) =  2030.00
  FLOW LENGTH(FEET) =   325.06   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  28.5 INCHES
```

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =  21.99
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  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  20647.00 TO NODE  20647.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   18.71
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.610
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B       20.06      0.75     0.250    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       29.79      0.75     0.900    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       14.97      0.75     0.600    56
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B       13.31      0.75     0.400    56
  COMMERCIAL                 B       16.98      0.75     0.100    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B       17.61      0.75     0.500    56
  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) =  125.16
  EFFECTIVE AREA(ACRES) =    235.47   AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.73  AREA-AVERAGED Ap =  0.69
  TOTAL AREA(ACRES) =      285.0       PEAK FLOW RATE(CFS) =     234.80

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   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
      2      196.56   31.36    1.181  0.73( 0.41) 0.57     285.0   20620.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     255.91  Tc(MIN.) =   18.71
  AREA-AVERAGED Fm(INCH/HR) =  0.40  AREA-AVERAGED Fp(INCH/HR) =  0.73
  AREA-AVERAGED Ap =  0.55  EFFECTIVE AREA(ACRES) =     235.47

****************************************************************************
  FLOW PROCESS FROM NODE  20647.00 TO NODE  20648.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  2030.00  DOWNSTREAM(FEET) =  2025.00
  FLOW LENGTH(FEET) =   149.90   MANNING'S N =  0.013
  DEPTH OF FLOW IN  51.0 INCH PIPE IS  37.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  22.68
  ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     255.91
```



```
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =   18.82
  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.) =   18.82
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.604
  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       0.31      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) =    0.34
  EFFECTIVE AREA(ACRES) =    235.78   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) =     255.91
  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  20648.00 TO NODE  20648.00 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      255.91   18.82    1.604  0.73( 0.40) 0.55     235.8   20640.00
      2      196.56   31.48    1.178  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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   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
  LONGEST FLOWPATH FROM NODE  20600.00 TO NODE  20648.00 =    5640.37 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   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
      2      309.99   29.28    1.230  0.74( 0.42) 0.57     421.2   20600.00
      3      292.94   31.48    1.178  0.74( 0.42) 0.57     429.8   20620.00
    TOTAL AREA(ACRES) =       429.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      353.44  Tc(MIN.) =   18.823
  EFFECTIVE AREA(ACRES) =    328.64  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) =     357.25
   ***STREET FLOWING FULL***
   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
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.98
 STREET FLOW TRAVEL TIME(MIN.) =   1.90   Tc(MIN.) =   20.72
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.514
 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        2.58      0.75     0.500    56
 COMMERCIAL                 B        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"               B        0.08      0.61     1.000    66
 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) =    7.63
 EFFECTIVE AREA(ACRES) =    335.44    AREA-AVERAGED Fm(INCH/HR) =  0.41
 AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.55
 TOTAL AREA(ACRES) =      436.6        PEAK FLOW RATE(CFS) =     353.44
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
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```
 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) = 1.27   HALFSTREET FLOOD WIDTH(FEET) =  56.59
 FLOW VELOCITY(FEET/SEC.) =  5.46   DEPTH*VELOCITY(FT*FT/SEC.) =   6.94

 *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.) =  11.66
 PIPE-FLOW(CFS) =     277.25
 PIPEFLOW TRAVEL TIME(MIN.) =   0.89    Tc(MIN.) =  19.71
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.560
 SUBAREA AREA(ACRES) =    6.80      SUBAREA RUNOFF(CFS) =    7.91
 TOTAL AREA(ACRES) =      436.6        PEAK FLOW RATE(CFS) =     353.44
 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) =   76.19
   ***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.) =    3.86
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.92
 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.) =   19.71
 RAINFALL INTENSITY(INCH/HR) =   1.56
 AREA-AVERAGED Fm(INCH/HR) =  0.41
 AREA-AVERAGED Fp(INCH/HR) =  0.74
 AREA-AVERAGED Ap =  0.55
 EFFECTIVE STREAM AREA(ACRES) =     335.44
 TOTAL STREAM AREA(ACRES) =     436.56
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     353.44

****************************************************************************
 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
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  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.492
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.419
  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        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) =     12.30
  TOTAL AREA(ACRES) =      7.15   PEAK FLOW RATE(CFS) =     12.30

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.36; 6HR = 1.90; 24HR = 4.02

****************************************************************************
  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) =      19.30
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.36
    HALFSTREET FLOOD WIDTH(FEET) =   11.55
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.64
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.37
  STREET FLOW TRAVEL TIME(MIN.) =   0.94   Tc(MIN.) =   10.43
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.285
  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        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) =   14.00
  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) =      25.44
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  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) = 0.39   HALFSTREET FLOOD WIDTH(FEET) =  12.96
  FLOW VELOCITY(FEET/SEC.) =  7.08   DEPTH*VELOCITY(FT*FT/SEC.) =   2.73
  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) =      31.10
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.40
    HALFSTREET FLOOD WIDTH(FEET) =   13.82
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.67
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.09
  STREET FLOW TRAVEL TIME(MIN.) =   0.93   Tc(MIN.) =   11.36
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.171
  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        6.22      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.35      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) =    7.57      SUBAREA RUNOFF(CFS) =   11.32
  EFFECTIVE AREA(ACRES) =     23.51    AREA-AVERAGED Fm(INCH/HR) =  0.51
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.68
  TOTAL AREA(ACRES) =       23.5        PEAK FLOW RATE(CFS) =      35.13

  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) =  14.52
  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.
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  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) =      38.16
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.44
    HALFSTREET FLOOD WIDTH(FEET) =   15.70
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.39
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.25
  STREET FLOW TRAVEL TIME(MIN.) =   0.98   Tc(MIN.) =   12.34
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.067
  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        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) =    6.07
  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) =      38.98

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.02

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.44   HALFSTREET FLOOD WIDTH(FEET) =  15.85
  FLOW VELOCITY(FEET/SEC.) =  7.41   DEPTH*VELOCITY(FT*FT/SEC.) =   3.28
  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
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  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) =      40.63
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.51
    HALFSTREET FLOOD WIDTH(FEET) =   18.50
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.36
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.73
  STREET FLOW TRAVEL TIME(MIN.) =   0.88   Tc(MIN.) =   13.22
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.983
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        0.22      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.46      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        1.74      0.75     0.700    56
  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) =    3.30
  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) =      40.18

  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) = 0.51   HALFSTREET FLOOD WIDTH(FEET) =  18.44
  FLOW VELOCITY(FEET/SEC.) =  5.33   DEPTH*VELOCITY(FT*FT/SEC.) =   2.71
  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
  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
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  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      40.53
    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     SCS
       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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   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
      1      292.94   32.37    1.159  0.74( 0.42) 0.57     436.6   20620.00
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      2       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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      366.71   13.65    1.945  0.74( 0.42) 0.57     262.9   20649.00
      2      382.88   19.71    1.560  0.74( 0.42) 0.56     366.1   20640.00
      3      329.65   30.18    1.208  0.74( 0.42) 0.57     458.7   20600.00
      4      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) =  1.07
    HALFSTREET FLOOD WIDTH(FEET) =   46.64
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    8.70
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    9.33
  STREET 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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.66      0.75     0.500    56
  COMMERCIAL                 B        1.28      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.16      0.75     0.600    56
  RESIDENTIAL
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"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) =    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
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Manning's FRICTION FACTOR for Streetflow Section(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) =     402.32
  ***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      Fp         Ap      SCS
     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
"2 DWELLINGS/ACRE"          B       35.47      0.75     0.700    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 Tc :
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
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   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
     1      407.47   14.25    1.895  0.74( 0.43) 0.58     308.6   20649.00
     2      410.92   20.32    1.532  0.74( 0.42) 0.57     411.9   20640.00
     3      347.47   30.78    1.194  0.74( 0.43) 0.58     504.4   20600.00
     4      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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"       B        1.69      0.75     0.500    56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B       14.94      0.75     0.700    56
 COMMERCIAL                 B        1.47      0.75     0.100    56
 NATURAL FAIR COVER
 "OPEN BRUSH"               B        1.34      0.61     1.000    66
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        1.78      0.75     0.600    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
```



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 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 **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (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
     2      414.33   21.30    1.489  0.74( 0.43) 0.58     433.1   20640.00
     3      350.55   31.77    1.172  0.74( 0.43) 0.58     525.6   20600.00
     4      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
============================================================================
```

```
  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
```

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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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             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
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 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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.204
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.190
  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        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
  TOTAL AREA(ACRES) =      9.99   PEAK FLOW RATE(CFS) =     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
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 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      Fp         Ap     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
 "OPEN BRUSH"               B        2.38      0.61     1.000    66
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"      B        0.08      0.75     0.400    56
 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) =     19.63
 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
 TOTAL AREA(ACRES) =       16.6         PEAK FLOW RATE(CFS) =      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      Fp         Ap     SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        2.10      0.75     0.600    56
 NATURAL FAIR COVER
 "OPEN BRUSH"               B        3.64      0.61     1.000    66
 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
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 SUBAREA AREA(ACRES) =    5.74       SUBAREA RUNOFF(CFS) =    7.60
 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         Ap     SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL FAIR COVER
 "OPEN BRUSH"               B        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) =     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.

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 FLOW PROCESS FROM NODE  20704.00 TO NODE  20705.00 IS CODE =  92
----------------------------------------------------------------------------
 >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
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==========================================================================
  UPSTREAM NODE ELEVATION(FEET) =   2070.00
  DOWNSTREAM NODE ELEVATION(FEET) =   2065.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   236.79
  "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) =  1.914
  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        4.91      0.75     0.400    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.39      0.75     0.600    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.79      0.61     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.72
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.518
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     38.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.24
  AVERAGE FLOW DEPTH(FEET) =   0.66   FLOOD WIDTH(FEET) =   39.82
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.75   Tc(MIN.) =   14.01
  SUBAREA AREA(ACRES) =    8.09       SUBAREA RUNOFF(CFS) =   11.22
  EFFECTIVE AREA(ACRES) =   33.33     AREA-AVERAGED Fm(INCH/HR) =   0.49
  AREA-AVERAGED Fp(INCH/HR) =   0.68  AREA-AVERAGED Ap =   0.72
  TOTAL AREA(ACRES) =       33.3         PEAK FLOW RATE(CFS) =      42.79

  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) =  0.68   FLOOD WIDTH(FEET) =   41.76
  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.

****************************************************************************
  FLOW PROCESS FROM NODE  20705.00 TO NODE  20706.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2065.00  DOWNSTREAM ELEVATION(FEET) = 2060.00
  STREET LENGTH(FEET) =   308.42   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) =      45.40
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    ***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.) =    4.32
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.52
  STREET FLOW TRAVEL TIME(MIN.) =   1.19   Tc(MIN.) =   15.20
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.823
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        3.14      0.61     1.000    66
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.43      0.75     0.600    56
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        0.92      0.75     0.400    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.64
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.839
  SUBAREA AREA(ACRES) =    4.49       SUBAREA RUNOFF(CFS) =    5.21
  EFFECTIVE AREA(ACRES) =     37.82    AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap =  0.73
  TOTAL AREA(ACRES) =       37.8         PEAK FLOW RATE(CFS) =      45.26

  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) =  22.04
  FLOW VELOCITY(FEET/SEC.) =  4.33   DEPTH*VELOCITY(FT*FT/SEC.) =   2.52
  LONGEST FLOWPATH FROM NODE  20700.00 TO NODE  20706.00 =    2351.93 FEET.

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  FLOW PROCESS FROM NODE  20706.00 TO NODE  20707.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2060.00  DOWNSTREAM ELEVATION(FEET) = 2055.00
  STREET LENGTH(FEET) =   216.66   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) =   0.87

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      45.78
    ***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.) =    4.90
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  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.72
 STREET FLOW TRAVEL TIME(MIN.) =   0.74   Tc(MIN.) =   15.94
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.772
 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        0.78      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) =    0.78      SUBAREA RUNOFF(CFS) =    1.03
 EFFECTIVE AREA(ACRES) =     38.60    AREA-AVERAGED Fm(INCH/HR) =  0.49
 AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap =  0.73
 TOTAL AREA(ACRES) =       38.6        PEAK FLOW RATE(CFS) =      45.26
 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) = 0.55   HALFSTREET FLOOD WIDTH(FEET) =  20.70
 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.

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 FLOW PROCESS FROM NODE  20707.00 TO NODE  20708.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 2055.00  DOWNSTREAM ELEVATION(FEET) = 2040.00
 STREET LENGTH(FEET) =   337.91   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) =      49.17
   ***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.) =    6.19
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.22
 STREET FLOW TRAVEL TIME(MIN.) =   0.91   Tc(MIN.) =   16.85
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.714
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 NATURAL FAIR COVER
 "OPEN BRUSH"               B        4.36      0.61     1.000    66
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 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        1.39      0.75     0.700    56
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"      B        1.58      0.75     0.400    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.65
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.814
 SUBAREA AREA(ACRES) =    7.33      SUBAREA RUNOFF(CFS) =    7.82
 EFFECTIVE AREA(ACRES) =     45.93    AREA-AVERAGED Fm(INCH/HR) =  0.50
 AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap =  0.74
 TOTAL AREA(ACRES) =       45.9        PEAK FLOW RATE(CFS) =      50.36

 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) = 0.52   HALFSTREET FLOOD WIDTH(FEET) =  19.11
 FLOW VELOCITY(FEET/SEC.) =  6.27   DEPTH*VELOCITY(FT*FT/SEC.) =   3.27
 LONGEST FLOWPATH FROM NODE  20700.00 TO NODE  20708.00 =    2906.50 FEET.

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 FLOW PROCESS FROM NODE  20708.00 TO NODE  20709.00 IS CODE =  63
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION # 14 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 2040.00  DOWNSTREAM ELEVATION(FEET) = 2035.00
 STREET LENGTH(FEET) =   377.00   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 =  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) =      52.84
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.83
   HALFSTREET FLOOD WIDTH(FEET) =   41.41
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.41
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.64
 STREET FLOW TRAVEL TIME(MIN.) =   1.43   Tc(MIN.) =   18.28
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.632
 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        0.45      0.75     0.700    56
 NATURAL FAIR COVER
 "OPEN BRUSH"               B        1.33      0.61     1.000    66
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"      B        1.75      0.75     0.400    56
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"       B        1.06      0.75     0.500    56
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  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.69
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.626
  SUBAREA AREA(ACRES) =    4.59      SUBAREA RUNOFF(CFS) =    4.97
  EFFECTIVE AREA(ACRES) =     50.52    AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap =  0.73
  TOTAL AREA(ACRES) =       50.5        PEAK FLOW RATE(CFS) =      51.96

  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) = 0.82   HALFSTREET FLOOD WIDTH(FEET) =  40.94
  FLOW VELOCITY(FEET/SEC.) =  4.40   DEPTH*VELOCITY(FT*FT/SEC.) =   3.62
  LONGEST FLOWPATH FROM NODE  20700.00 TO NODE  20709.00 =    3283.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20709.00 TO NODE  20710.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 14 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2035.00  DOWNSTREAM ELEVATION(FEET) = 2030.00
  STREET LENGTH(FEET) =   326.96   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) =   1.06

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      53.98
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.81
    HALFSTREET FLOOD WIDTH(FEET) =   40.16
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.70
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.83
  STREET FLOW TRAVEL TIME(MIN.) =   1.16   Tc(MIN.) =   19.44
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.573
  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        0.82      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.94      0.61     1.000    66
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        1.18      0.75     0.400    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        1.02      0.75     0.500    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.70
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.630
  SUBAREA AREA(ACRES) =    3.96      SUBAREA RUNOFF(CFS) =    4.04
  EFFECTIVE AREA(ACRES) =     54.48    AREA-AVERAGED Fm(INCH/HR) =  0.49
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  AREA-AVERAGED Fp(INCH/HR) =  0.67  AREA-AVERAGED Ap =  0.72
  TOTAL AREA(ACRES) =       54.5        PEAK FLOW RATE(CFS) =      53.31

  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) = 0.81   HALFSTREET FLOOD WIDTH(FEET) =  40.00
  FLOW VELOCITY(FEET/SEC.) =  4.67   DEPTH*VELOCITY(FT*FT/SEC.) =   3.79
  LONGEST FLOWPATH FROM NODE  20700.00 TO NODE  20710.00 =    3610.46 FEET.

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  FLOW PROCESS FROM NODE  20710.00 TO NODE  20711.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 14 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2030.00  DOWNSTREAM ELEVATION(FEET) = 2025.00
  STREET LENGTH(FEET) =   298.59   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) =   1.04

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      55.93
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.81
    HALFSTREET FLOOD WIDTH(FEET) =   40.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.90
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.98
  STREET FLOW TRAVEL TIME(MIN.) =   1.02   Tc(MIN.) =   20.45
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.526
  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        4.34      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        0.10      0.61     1.000    66
  RESIDENTIAL
  "8-10 DWELLINGS/ACRE"      B        0.27      0.75     0.400    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.92      0.75     0.500    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.74
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.658
  SUBAREA AREA(ACRES) =    5.63      SUBAREA RUNOFF(CFS) =    5.25
  EFFECTIVE AREA(ACRES) =     60.11    AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.68  AREA-AVERAGED Ap =  0.72
  TOTAL AREA(ACRES) =       60.1        PEAK FLOW RATE(CFS) =      56.23

  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) = 0.81   HALFSTREET FLOOD WIDTH(FEET) =  40.16
  FLOW VELOCITY(FEET/SEC.) =  4.90   DEPTH*VELOCITY(FT*FT/SEC.) =   3.99
  LONGEST FLOWPATH FROM NODE  20700.00 TO NODE  20711.00 =    3909.05 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20711.00 TO NODE  20712.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2025.00  DOWNSTREAM(FEET) =   2020.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   279.66   CHANNEL SLOPE =  0.0179
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      56.23
  FLOW VELOCITY(FEET/SEC.) =   5.43   FLOW DEPTH(FEET) =   1.35
  TRAVEL TIME(MIN.) =   0.86   Tc(MIN.) =   21.31
  LONGEST FLOWPATH FROM NODE  20700.00 TO NODE  20712.00 =    4188.71 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20712.00 TO NODE  20712.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   21.31
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.489
  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        2.62      0.75     0.700    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.72      0.75     0.500    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.657
  SUBAREA AREA(ACRES) =    3.34      SUBAREA RUNOFF(CFS) =    3.00
  EFFECTIVE AREA(ACRES) =     63.45   AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.68  AREA-AVERAGED Ap =  0.71
  TOTAL AREA(ACRES) =       63.5       PEAK FLOW RATE(CFS) =      57.22

  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  20712.00 TO NODE  20713.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2020.00  DOWNSTREAM(FEET) =   2000.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   371.84   CHANNEL SLOPE =  0.0538
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   2.50
  CHANNEL FLOW THRU SUBAREA(CFS) =      57.22
  FLOW VELOCITY(FEET/SEC.) =   8.07   FLOW DEPTH(FEET) =   1.01
```



```
  TRAVEL TIME(MIN.) =   0.77   Tc(MIN.) =   22.08
  LONGEST FLOWPATH FROM NODE  20700.00 TO NODE  20713.00 =    4560.55 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20713.00 TO NODE  20713.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   22.08
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.457
  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        2.10      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        3.26      0.61     1.000    66
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        1.09      0.75     0.500    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.67
  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
  AREA-AVERAGED Fp(INCH/HR) =  0.68  AREA-AVERAGED Ap =  0.72
  TOTAL AREA(ACRES) =       69.9       PEAK FLOW RATE(CFS) =      60.74

  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  20713.00 TO NODE  20714.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   2000.00  DOWNSTREAM(FEET) =   1960.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   732.38   CHANNEL SLOPE =  0.0546
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   2.50
  CHANNEL FLOW THRU SUBAREA(CFS) =      60.74
  FLOW VELOCITY(FEET/SEC.) =   8.30   FLOW DEPTH(FEET) =   1.03
  TRAVEL TIME(MIN.) =   1.47   Tc(MIN.) =   23.55
  LONGEST FLOWPATH FROM NODE  20700.00 TO NODE  20714.00 =    5292.93 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20724.00 TO NODE  20724.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   23.55
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.402
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.63      0.61     1.000    66
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        1.94      0.75     0.500    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) =    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 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
  "3-4 DWELLINGS/ACRE"       B        0.21      0.75     0.600    56    8.74
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        1.38      0.61     1.000    66   14.97
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        5.85      0.75     0.700    56    9.29
  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
```



```
  TOTAL STREAM AREA(ACRES) =       7.44
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      13.42

****************************************************************************
  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 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
  "3-4 DWELLINGS/ACRE"       B        0.21      0.75     0.600    56    7.77
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        2.34      0.61     1.000    66   13.31
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        4.69      0.75     0.700    56    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)     Ap     Ae     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
      2       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.
```

```
 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     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
     2       26.39    8.74    2.542  0.70( 0.54) 0.77      14.7   20718.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      27.22    Tc(MIN.) =     7.77
 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 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
```



```
 RAINFALL INTENSITY(INCH/HR) =   2.59
 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      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        1.32      0.75     0.700    56
 NATURAL FAIR COVER
 "OPEN BRUSH"               B        4.12      0.61     1.000    66
 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
```

```
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.28   Tc(MIN.) =   11.97
  SUBAREA AREA(ACRES) =    5.44       SUBAREA RUNOFF(CFS) =    7.41
  EFFECTIVE AREA(ACRES) =   11.09     AREA-AVERAGED Fm(INCH/HR) =   0.56
  AREA-AVERAGED Fp(INCH/HR) =   0.69  AREA-AVERAGED Ap =   0.81
  TOTAL AREA(ACRES) =       11.1          PEAK FLOW RATE(CFS) =      15.45

  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.) =   6.63   DEPTH*VELOCITY(FT*FT/SEC) =   3.28
  LONGEST FLOWPATH FROM NODE  20720.00 TO NODE  20722.00 =    1162.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20722.00 TO NODE  20722.00 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.) =   11.97
  RAINFALL INTENSITY(INCH/HR) =   2.10
  AREA-AVERAGED Fm(INCH/HR) =  0.56
  AREA-AVERAGED Fp(INCH/HR) =  0.69
  AREA-AVERAGED Ap =  0.81
  EFFECTIVE STREAM AREA(ACRES) =      11.09
  TOTAL STREAM AREA(ACRES) =      11.09
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      15.45

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       35.77    8.44    2.595  0.72( 0.54) 0.75      19.3   20718.50
      1       34.32    9.41    2.431  0.72( 0.54) 0.75      20.2   20718.00
      2       15.45   11.97    2.105  0.69( 0.56) 0.81      11.1   20720.00

  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       50.12    8.44    2.595  0.71( 0.54) 0.77      27.2   20718.50
      2       49.04    9.41    2.431  0.71( 0.54) 0.77      28.9   20718.00
      3       43.86   11.97    2.105  0.70( 0.55) 0.77      31.2   20720.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      50.12    Tc(MIN.) =     8.44
  EFFECTIVE AREA(ACRES) =      27.16   AREA-AVERAGED Fm(INCH/HR) =  0.54
  AREA-AVERAGED Fp(INCH/HR) =  0.71  AREA-AVERAGED Ap =  0.77
  TOTAL AREA(ACRES) =       31.2
  LONGEST FLOWPATH FROM NODE  20720.00 TO NODE  20722.00 =    1162.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20722.00 TO NODE  20723.00 IS CODE =  92
----------------------------------------------------------------------------
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```
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =   2015.00
  DOWNSTREAM NODE ELEVATION(FEET) =   2000.00
  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
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.01700
  MAXIMUM DEPTH(FEET) =   1.00
  *  10 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
  "2 DWELLINGS/ACRE"         B        5.92      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        5.87      0.61     1.000    66
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.67
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.849
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     59.27
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.81
  AVERAGE FLOW DEPTH(FEET) =   0.73   FLOOD WIDTH(FEET) =   47.43
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.91   Tc(MIN.) =   10.35
  SUBAREA AREA(ACRES) =   11.79       SUBAREA RUNOFF(CFS) =   18.33
  EFFECTIVE AREA(ACRES) =   38.95     AREA-AVERAGED Fm(INCH/HR) =   0.55
  AREA-AVERAGED Fp(INCH/HR) =   0.69  AREA-AVERAGED Ap =   0.79
  TOTAL AREA(ACRES) =       43.0          PEAK FLOW RATE(CFS) =      61.16

  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) =  0.73   FLOOD WIDTH(FEET) =   48.03
  FLOW VELOCITY(FEET/SEC.) =   5.86   DEPTH*VELOCITY(FT*FT/SEC) =   4.29
  LONGEST FLOWPATH FROM NODE  20720.00 TO NODE  20723.00 =    1827.20 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20723.00 TO NODE  20724.00 IS CODE =  92
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =   2000.00
  DOWNSTREAM NODE ELEVATION(FEET) =   1960.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   791.28
  "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) =  2.107
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        9.77      0.61     1.000    66
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        0.38      0.75     0.500    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.62
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.981
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  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     68.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   8.29
  AVERAGE FLOW DEPTH(FEET) =   0.68   FLOOD WIDTH(FEET) =   42.21
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.59   Tc(MIN.) =   11.94
  SUBAREA AREA(ACRES) =   10.15       SUBAREA RUNOFF(CFS) =   13.72
  EFFECTIVE AREA(ACRES) =   49.10     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) =      68.27

  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) =  0.68   FLOOD WIDTH(FEET) =   42.21
  FLOW VELOCITY(FEET/SEC.) =   8.32   DEPTH*VELOCITY(FT*FT/SEC) =   5.68
  LONGEST FLOWPATH FROM NODE  20720.00 TO NODE  20724.00 =    2618.48 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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       68.27   11.94    2.107  0.68( 0.56) 0.83      49.1   20718.50
      2       66.18   12.93    2.009  0.68( 0.56) 0.83      50.8   20718.00
      3       59.19   15.56    1.798  0.68( 0.56) 0.83      53.2   20720.00
  LONGEST FLOWPATH FROM NODE  20720.00 TO NODE  20724.00 =    2618.48 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       60.92   23.55    1.402  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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      123.13   11.94    2.107  0.68( 0.53) 0.79      86.9   20718.50
      2      121.97   12.93    2.009  0.68( 0.53) 0.79      91.7   20718.00
      3      116.97   15.56    1.798  0.68( 0.53) 0.78     102.4   20720.00
      4      101.15   23.55    1.402  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) =      123.13  Tc(MIN.) =   11.942
  EFFECTIVE AREA(ACRES) =     86.86  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 <<<<<
============================================================================
```



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****************************************************************************
  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  42.0 INCH PIPE IS  29.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.95
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     123.13
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =   12.02
  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:
   STREAM       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      412.44   15.24  0.74( 0.43) 0.58     329.8   20649.00
      2      414.33   21.30  0.74( 0.43) 0.58     433.1   20640.00
      3      350.55   31.77  0.74( 0.43) 0.58     525.6   20600.00
      4      335.38   33.79  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       Q      Tc      Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.)  (INCH/HR)          (ACRES)    NODE
      1      412.44   15.24  0.74( 0.43) 0.58     329.8   20649.00
      2      414.33   21.30  0.74( 0.43) 0.58     433.1   20640.00
      3      350.55   31.77  0.74( 0.43) 0.58     525.6   20600.00
      4      335.38   33.79  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 =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
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==============================================================================

******************************************************************************
  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      Fp         Ap     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    56
  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
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        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
      1      421.42   15.89    1.776  0.73( 0.44) 0.60     350.3   20649.00
      2      420.56   21.96    1.462  0.73( 0.43) 0.59     453.5   20640.00
      3      355.68   32.34    1.159  0.73( 0.44) 0.59     546.1   20600.00
      4      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
      2      420.56   21.96    1.462  0.73( 0.43) 0.59     453.5   20640.00
      3      355.68   32.34    1.159  0.73( 0.44) 0.59     546.1   20600.00
      4      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       Q      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
      3      116.97   15.64    1.793  0.68( 0.53) 0.78     102.4   20720.00
      4      101.15   23.63    1.399  0.68( 0.52) 0.77     127.7   20700.00
```

```
  LONGEST FLOWPATH FROM NODE  20700.00 TO NODE  20725.00 =    5374.33 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      519.13   12.02    2.099  0.72( 0.46) 0.64     351.9   20718.50
      2      525.47   13.01    2.001  0.72( 0.46) 0.64     378.6   20718.00
      3      537.02   15.64    1.793  0.72( 0.46) 0.64     447.1   20720.00
      4      537.89   15.89    1.776  0.72( 0.46) 0.64     453.5   20649.00
      5      525.02   21.96    1.462  0.72( 0.45) 0.63     575.9   20640.00
      6      511.24   23.63    1.399  0.72( 0.45) 0.63     596.1   20700.00
      7      429.15   32.34    1.159  0.72( 0.45) 0.63     673.7   20600.00
      8      408.86   34.37    1.118  0.72( 0.45) 0.63     682.3   20620.00
    TOTAL AREA(ACRES) =       682.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      537.89  Tc(MIN.) =   15.889
  EFFECTIVE AREA(ACRES) =    453.46  AREA-AVERAGED Fm(INCH/HR) =  0.46
  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= 0.30;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.
   EQUIVALENT 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)<<<<<
```



```
============================================================================
  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) =     537.89
  FLOW VELOCITY(FEET/SEC.) =  28.83   FLOW DEPTH(FEET) =   1.90
  TRAVEL TIME(MIN.) =   0.82   Tc(MIN.) =   35.19
  LONGEST 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      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"        B        3.96      0.75     0.500    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"          B        4.31      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"                B       14.46      0.61     1.000    66
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        B        0.98      0.75     0.600    56
  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= 1.00
  UNIT-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
  TOTAL AREA(ACRES) =      706.0       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  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) =     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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        1.92      0.75     0.500    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        6.30      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       12.35      0.61     1.000    66
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.34      0.75     0.600    56
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        3.88      0.75     0.500    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       12.91      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        6.79      0.75     0.600    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        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.
   EQUIVALENT 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) =     537.89
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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.
   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
  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      Fp         Ap     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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        5.96      0.61     1.000    66
  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) =   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
```

```
****************************************************************************
  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) =      26.60
  FLOW VELOCITY(FEET/SEC.) =  12.33   FLOW DEPTH(FEET) =   0.53
  TRAVEL TIME(MIN.) =   1.17   Tc(MIN.) =   11.22
  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.) =   11.22
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.188
  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        0.59      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B        7.70      0.61     1.000    66
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        5.46      0.75     0.500    56
  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) =   20.71
  EFFECTIVE AREA(ACRES) =     29.72   AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.66  AREA-AVERAGED Ap =  0.76
  TOTAL AREA(ACRES) =       29.7       PEAK FLOW RATE(CFS) =      45.17

  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  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) =      45.17
  FLOW VELOCITY(FEET/SEC.) =  12.51   FLOW DEPTH(FEET) =   0.79
  TRAVEL TIME(MIN.) =   1.13   Tc(MIN.) =   12.35
  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.) =   12.35
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.065
  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       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"       B        4.95      0.75     0.500    56
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       17.32      0.61     1.000    66
  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) =   89.33
  EFFECTIVE 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) =     131.23

  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  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.35
  RAINFALL INTENSITY(INCH/HR) =   2.07
  AREA-AVERAGED Fm(INCH/HR) =  0.52
  AREA-AVERAGED Fp(INCH/HR) =  0.69
  AREA-AVERAGED Ap =  0.76
  EFFECTIVE STREAM AREA(ACRES) =      94.59
  TOTAL STREAM AREA(ACRES) =      94.59
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     131.23

****************************************************************************
  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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.865
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.116
  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        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      Fp         Ap     SCS
       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) =    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<<<<<
```



```
  >>>>>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) =      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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        6.61      0.75     0.700    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 =  0.697
  SUBAREA AREA(ACRES) =    6.78      SUBAREA RUNOFF(CFS) =    7.47
  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         Ap     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"         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         Ap     SCS
       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"         B        9.61      0.75     0.700    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.694
  SUBAREA AREA(ACRES) =   10.18      SUBAREA RUNOFF(CFS) =    9.15
  EFFECTIVE AREA(ACRES) =     53.02   AREA-AVERAGED Fm(INCH/HR) =  0.52
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.70
  TOTAL AREA(ACRES) =       53.0       PEAK FLOW RATE(CFS) =      47.57

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.38; 6HR = 1.95; 24HR = 4.03

****************************************************************************
  FLOW PROCESS FROM NODE  20747.00 TO NODE  20748.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1840.00  DOWNSTREAM(FEET) =   1815.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   752.37   CHANNEL SLOPE =  0.0332
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  15.000
  MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      47.57
  FLOW VELOCITY(FEET/SEC.) =   3.62   FLOW DEPTH(FEET) =   0.94
  TRAVEL TIME(MIN.) =   3.46   Tc(MIN.) =   24.08
  LONGEST FLOWPATH FROM NODE  20740.00 TO NODE  20748.00 =    4550.01 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20748.00 TO NODE  20748.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   24.08
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.384
  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        8.54      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.23      0.75     0.600    56
  PUBLIC PARK                B        0.78      0.75     0.850    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        1.16      0.75     0.500    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.673
  SUBAREA AREA(ACRES) =   12.71      SUBAREA RUNOFF(CFS) =   10.06
  EFFECTIVE AREA(ACRES) =     65.73   AREA-AVERAGED Fm(INCH/HR) =  0.52
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.69
  TOTAL AREA(ACRES) =       65.7       PEAK FLOW RATE(CFS) =      51.20

  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  20748.00 TO NODE  20748.00 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.) =   24.08
  RAINFALL INTENSITY(INCH/HR) =   1.38
  AREA-AVERAGED Fm(INCH/HR) =  0.52
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.69
  EFFECTIVE STREAM AREA(ACRES) =      65.73
  TOTAL STREAM AREA(ACRES) =      65.73
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      51.20
  ** CONFLUENCE DATA **
  STREAM      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1       537.89   36.66     753.64    20620.00
     2       131.23   12.35      94.59    20730.00
     3        51.20   24.08      65.73    20740.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.38;6H= 1.95;24H= 4.02
  S-GRAPH: VALLEY(DEV.)= 76.6%;VALLEY(UNDEV.)/DESERT= 23.4%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.61; LAG(HR) = 0.49; Fm(INCH/HR) = 0.47; Ybar = 0.56
  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
  LONGEST FLOWPATH FROM NODE  20620.00 TO NODE  20748.00 =   11898.10 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=.0352
  TIME OF PEAK FLOW(HR) = 16.50  RUNOFF VOLUME(AF) =     144.13
  PEAK FLOW RATE(CFS) =     594.59

****************************************************************************
  FLOW PROCESS FROM NODE  20748.00 TO NODE  20749.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1815.00  DOWNSTREAM(FEET) =   1700.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2764.03   CHANNEL SLOPE =  0.0416
  CHANNEL BASE(FEET) =    8.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   4.00
  CHANNEL FLOW THRU SUBAREA(CFS) =     594.59
  FLOW VELOCITY(FEET/SEC.) =  25.26   FLOW DEPTH(FEET) =   1.97
  TRAVEL TIME(MIN.) =   1.82   Tc(MIN.) =   38.48
  LONGEST FLOWPATH FROM NODE  20620.00 TO NODE  20749.00 =   14662.13 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20749.00 TO NODE  20749.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   38.48
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.044
```

```
  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       46.16      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        9.13      0.75     0.600    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B       13.04      0.75     0.500    56
  PUBLIC PARK                B       14.63      0.75     0.850    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.684
  SUBAREA AREA(ACRES) =   82.96
  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.)= 78.6%;VALLEY(UNDEV.)/DESERT= 21.4%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.64; LAG(HR) = 0.51; Fm(INCH/HR) = 0.47; 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) =      996.9
  LONGEST FLOWPATH FROM NODE  20620.00 TO NODE  20749.00 =   14662.13 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0415; Lca/L=0.4,n=.0372; Lca/L=0.5,n=.0342;Lca/L=0.6,n=.0319
  TIME OF PEAK FLOW(HR) = 16.58  RUNOFF VOLUME(AF) =     156.04
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =     631.00
  TOTAL AREA(ACRES) =      996.9       PEAK FLOW RATE(CFS) =     631.00

  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  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) =     631.00
  FLOW VELOCITY(FEET/SEC.) =  23.32   FLOW DEPTH(FEET) =   2.19
  TRAVEL TIME(MIN.) =   2.26   Tc(MIN.) =   40.75
  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.) =   40.75
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.009
  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       17.57      0.75     0.500    56
  COMMERCIAL                 B        0.79      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       11.86      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       51.53      0.75     0.700    56
  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= 0.30;30M= 0.61;1H= 0.80;3H= 1.38;6H= 1.95;24H= 4.02
  S-GRAPH: VALLEY(DEV.)= 80.2%;VALLEY(UNDEV.)/DESERT= 19.8%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.68; LAG(HR) = 0.54; Fm(INCH/HR) = 0.47; Ybar = 0.57
  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=.0378; Lca/L=0.4,n=.0339; Lca/L=0.5,n=.0312;Lca/L=0.6,n=.0291
  TIME OF PEAK FLOW(HR) = 16.58  RUNOFF VOLUME(AF) =     168.74
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =     664.02
  TOTAL AREA(ACRES) =     1078.7       PEAK FLOW RATE(CFS) =     664.02

  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  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) =     664.02    Tc(MIN.) =   40.75
  AREA-AVERAGED Fm(INCH/HR) =  0.47   Ybar = 0.57
  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
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.056
  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        5.98      0.75     0.700    56   13.23
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.60      0.75     0.600    56   12.44
```

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  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.44      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        4.07      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) =    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
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  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  10.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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      Fp         Ap     SCS
       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
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  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        9.79      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.89      0.75     0.600    56
  SCHOOL                     B        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) =      36.52

  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***
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    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      Fp         Ap     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                     B        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
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  AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.13
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.92
STREET FLOW TRAVEL TIME(MIN.) =   1.84   Tc(MIN.) =   30.17
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.208
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        9.12      0.75     0.700    56
RESIDENTIAL
"3-4 DWELLINGS/ACRE"       B        2.57      0.75     0.600    56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.678
SUBAREA AREA(ACRES) =   11.69      SUBAREA RUNOFF(CFS) =    7.38
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) =      64.77

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 STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.55   HALFSTREET FLOOD WIDTH(FEET) =  20.39
FLOW VELOCITY(FEET/SEC.) =  7.16   DEPTH*VELOCITY(FT*FT/SEC.) =   3.92
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) =      67.93
   ***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.) =    7.63
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.15
 STREET FLOW TRAVEL TIME(MIN.) =   1.84   Tc(MIN.) =   32.01
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.166
 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        8.65      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 =  0.681
 SUBAREA AREA(ACRES) =   10.69      SUBAREA RUNOFF(CFS) =    6.32
 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) =      67.19

 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) = 0.54   HALFSTREET FLOOD WIDTH(FEET) =  20.09
 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.

****************************************************************************
 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) =      84.25
   ***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.) =    6.59
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.16
 STREET FLOW TRAVEL TIME(MIN.) =   2.39   Tc(MIN.) =   34.40
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.117
 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       50.96      0.75     0.700    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B       11.45      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) =   62.41      SUBAREA RUNOFF(CFS) =   34.10
```

```
  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) =      96.25

  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      Fp         Ap     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
```



```
  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) = 0.65   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"         B       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     0.850    56
  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
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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      Fp         Ap     SCS
       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"         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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B       19.08      0.75     0.500    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B      133.50      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       16.16      0.75     0.600    56
  COMMERCIAL                 B       11.70      0.75     0.100    56
  MOBILE HOME PARK           B        5.20      0.75     0.250    56
  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) =   86.74
  EFFECTIVE AREA(ACRES) =    550.66   AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.66
  TOTAL AREA(ACRES) =      550.7       PEAK FLOW RATE(CFS) =     241.96

  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  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.) =   42.55
  RAINFALL INTENSITY(INCH/HR) =   0.98
  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 =     241.96
  ** CONFLUENCE DATA **
  STREAM      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1       664.02   40.75     1078.67    20620.00
     2       241.96   42.55      550.66    20750.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.30;30M= 0.61;1H= 0.80;3H= 1.38;6H= 1.95;24H= 4.03
  S-GRAPH: VALLEY(DEV.)= 86.9%;VALLEY(UNDEV.)/DESERT= 13.1%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  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; 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=.0378; Lca/L=0.4,n=.0339; Lca/L=0.5,n=.0312;Lca/L=0.6,n=.0291
  TIME OF PEAK FLOW(HR) = 16.58  RUNOFF VOLUME(AF) =     250.72
  PEAK FLOW RATE(CFS) =     979.09

****************************************************************************
  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) =     979.09
  FLOW VELOCITY(FEET/SEC.) =  24.60   FLOW DEPTH(FEET) =   2.61
  TRAVEL TIME(MIN.) =   2.23   Tc(MIN.) =   42.98
  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.) =   42.98
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.977
  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       27.93      0.75     0.600    56
  MOBILE HOME PARK           B        2.86      0.75     0.250    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       36.04      0.75     0.700    56
  PUBLIC PARK                B        0.07      0.75     0.850    56
  COMMERCIAL                 B        0.16      0.75     0.100    56
  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= 1.00
  UNIT-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=.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<<<<<
============================================================================
```

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

==========

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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:




 ************************* DESCRIPTION OF STUDY *************************
* REDLANDS MPD  - UPDATE                                                *
* REVISED RATIONAL METHOD HYDROLOGY - 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
     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
```



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 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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.095
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.331
  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        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
  STREET HALFWIDTH(FEET) = 18.00
```

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =      18.67
   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      Fp         Ap     SCS
      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) =      21.66

 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
```



```
 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) =      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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        0.63      0.75     0.600    56
 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) =    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
```

```
  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      Fp         Ap     SCS
      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    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      Fp         Ap     SCS
      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         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        7.96      0.75     0.700    56
 RESIDENTIAL
 "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 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
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  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.68
  TOTAL AREA(ACRES) =       48.8        PEAK FLOW RATE(CFS) =      55.80

  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) = 0.62   HALFSTREET FLOOD WIDTH(FEET) =  23.93
  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.

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  FLOW PROCESS FROM NODE  20805.00 TO NODE  20806.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  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

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      83.05
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.59
    HALFSTREET FLOOD WIDTH(FEET) =   22.53
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.63
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.51
  STREET FLOW TRAVEL TIME(MIN.) =   1.35   Tc(MIN.) =   17.14
  *  10 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
  "2 DWELLINGS/ACRE"         B       36.94      0.75     0.700    56
  SCHOOL                     B        3.99      0.75     0.600    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        9.63      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.22      0.75     0.900    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.674
  SUBAREA AREA(ACRES) =   50.78      SUBAREA RUNOFF(CFS) =   54.48
  EFFECTIVE AREA(ACRES) =     99.56    AREA-AVERAGED Fm(INCH/HR) =  0.51
  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):
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  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) = 0.63   HALFSTREET FLOOD WIDTH(FEET) =  24.73
  FLOW VELOCITY(FEET/SEC.) =  8.22   DEPTH*VELOCITY(FT*FT/SEC.) =   5.22
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  616.6 FT WITH ELEVATION-DROP =  30.0 FT, IS   85.1 CFS,
         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.

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  FLOW PROCESS FROM NODE  20806.00 TO NODE  20807.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 2098.00  DOWNSTREAM ELEVATION(FEET) = 2090.00
  STREET LENGTH(FEET) =   573.68   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 =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =     109.01
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.78
    HALFSTREET FLOOD WIDTH(FEET) =   31.81
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.20
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.04
  STREET FLOW TRAVEL TIME(MIN.) =   1.84   Tc(MIN.) =   18.98
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.596
  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        2.85      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.45      0.75     0.600    56
  SCHOOL                     B        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) =    4.95
  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) =     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
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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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) =    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.

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  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) =     116.95
    ***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         Ap     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"       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) =   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
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 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.507
 SUBAREA AREA(ACRES) =   23.69      SUBAREA RUNOFF(CFS) =   21.19
 TOTAL AREA(ACRES) =      137.4        PEAK FLOW RATE(CFS) =     123.46

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =   60.29
   ***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.) =    8.40
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.19
 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) =     129.96
   ***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.) =    5.91
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.68
 STREET FLOW TRAVEL TIME(MIN.) =   1.61   Tc(MIN.) =   22.49
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.441
 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       12.89      0.75     0.700    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        2.65      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) =   15.54      SUBAREA RUNOFF(CFS) =   13.01
 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) =     128.35
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 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) = 0.79   HALFSTREET FLOOD WIDTH(FEET) =  32.42
 FLOW VELOCITY(FEET/SEC.) =  5.90   DEPTH*VELOCITY(FT*FT/SEC.) =   4.65
 ** 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
 PIPE-FLOW(CFS) =      64.54
 PIPEFLOW TRAVEL TIME(MIN.) =   0.88    Tc(MIN.) =  21.76
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.470
 SUBAREA AREA(ACRES) =   15.54      SUBAREA RUNOFF(CFS) =   13.42
 TOTAL AREA(ACRES) =      152.9        PEAK FLOW RATE(CFS) =     132.34

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =   67.80
   ***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.) =    5.00
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.23
 LONGEST FLOWPATH FROM NODE  20800.00 TO NODE  20810.00 =    5159.29 FEET.

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 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) =     147.10
   ***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.) =    9.96
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    6.67
 STREET FLOW TRAVEL TIME(MIN.) =   1.03   Tc(MIN.) =   22.79
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.430
```

```
 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       30.03      0.75     0.700    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        5.60      0.75     0.600    56
 PUBLIC PARK                B        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) =   29.53
 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) =     156.31

 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) =  27.17
 FLOW VELOCITY(FEET/SEC.) = 10.09   DEPTH*VELOCITY(FT*FT/SEC.) =   6.89

 *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) =  27.00    NUMBER OF PIPES =   1
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) =  18.27
 PIPE-FLOW(CFS) =      72.69
 PIPEFLOW TRAVEL TIME(MIN.) =   0.56    Tc(MIN.) =  22.32
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.448
 SUBAREA AREA(ACRES) =   35.75      SUBAREA RUNOFF(CFS) =   30.10
 TOTAL AREA(ACRES) =      188.6        PEAK FLOW RATE(CFS) =     159.36

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =   86.67
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.57
   HALFSTREET FLOOD WIDTH(FEET) =   21.74
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    8.51
   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  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) =     159.36
```



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 FLOW VELOCITY(FEET/SEC.) =   3.96   FLOW DEPTH(FEET) =   0.90
 TRAVEL TIME(MIN.) =   6.12   Tc(MIN.) =   28.44
 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.) =   28.44
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.252
 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        6.60      0.75     0.700    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        0.55      0.75     0.600    56
 PUBLIC PARK                B       18.85      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) =   15.18
 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) =     159.36
 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  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) =     159.36
 FLOW VELOCITY(FEET/SEC.) =   3.32   FLOW DEPTH(FEET) =   0.98
 TRAVEL TIME(MIN.) =   7.64   Tc(MIN.) =   36.08
 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.) =   36.08
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.085
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 PUBLIC PARK                B       80.80      0.75     0.850    56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B      130.26      0.75     0.700    56
```

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  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
  "OPEN BRUSH"               B        0.24      0.61     1.000    66
  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) =  113.99
  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) =     223.09

  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  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  25.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  26.66
  PIPE-FLOW(CFS) =     223.09
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   0.96    Tc(MIN.) =  37.05
  LONGEST FLOWPATH FROM NODE  20800.00 TO NODE  20814.00 =   10295.47 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20814.00 TO NODE  20814.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   37.05
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.068
  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       11.54      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       58.78      0.75     0.700    56
  PUBLIC PARK                B        6.25      0.75     0.850    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.697
  SUBAREA AREA(ACRES) =   76.57      SUBAREA RUNOFF(CFS) =   37.69
  EFFECTIVE AREA(ACRES) =    530.27   AREA-AVERAGED Fm(INCH/HR) =  0.54
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.72
  TOTAL AREA(ACRES) =      530.3       PEAK FLOW RATE(CFS) =     253.82

  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  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  28.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  26.45
  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
  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.) =   38.29
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.048
  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       28.73      0.75     0.600    56
  RESIDENTIAL
  "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
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.696
  SUBAREA AREA(ACRES) =  169.73      SUBAREA RUNOFF(CFS) =   80.46
  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) =     324.31

  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  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= 0.30;30M= 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%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.64; LAG(HR) = 0.51; Fm(INCH/HR) = 0.53; Ybar = 0.64
  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=.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         Ap     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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        8.26      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.53      0.75     0.600    56
  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.
   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) = 16.58  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
```

```
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  PEAK FLOW RATE(CFS) =     466.93    Tc(MIN.) =   40.34
  AREA-AVERAGED Fm(INCH/HR) =  0.53   Ybar = 0.63
  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
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.054
  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
  "3-4 DWELLINGS/ACRE"       B        2.07      0.75     0.600    56   12.46
  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
  SUBAREA RUNOFF(CFS) =     11.27
  TOTAL AREA(ACRES) =      8.08   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 = 1.93; 24HR = 3.82

****************************************************************************
  FLOW PROCESS FROM NODE  20821.00 TO NODE  20822.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1720.00  DOWNSTREAM ELEVATION(FEET) = 1700.00
  STREET LENGTH(FEET) =   668.72   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
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      19.52
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
```



```
    STREET FLOW DEPTH(FEET) =  0.43
    HALFSTREET FLOOD WIDTH(FEET) =   15.07
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.09
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.75
  STREET FLOW TRAVEL TIME(MIN.) =   2.73   Tc(MIN.) =   15.19
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.824
  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        4.10      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        9.73      0.75     0.700    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.670
  SUBAREA AREA(ACRES) =   13.83      SUBAREA RUNOFF(CFS) =   16.46
  EFFECTIVE AREA(ACRES) =     21.91    AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.67
  TOTAL AREA(ACRES) =       21.9        PEAK FLOW RATE(CFS) =      26.06

  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) = 0.46   HALFSTREET FLOOD WIDTH(FEET) =  16.87
  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.

****************************************************************************
  FLOW PROCESS FROM NODE  20822.00 TO NODE  20823.00 IS CODE =  33
----------------------------------------------------------------------------
  >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1700.00
  DOWNSTREAM NODE ELEVATION(FEET) =  1635.00
  FLOW LENGTH(FEET) =  1753.00   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  11.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.34
  PIPE-FLOW(CFS) =      26.06
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   2.16    Tc(MIN.) =  17.35
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.684
  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       28.07      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        8.56      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.677
  SUBAREA AREA(ACRES) =   36.63      SUBAREA RUNOFF(CFS) =   38.84
  EFFECTIVE AREA(ACRES) =     58.54    AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.67
  TOTAL AREA(ACRES) =       58.5        PEAK FLOW RATE(CFS) =      62.14
```

```
 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      Q        Tc      AREA      HEADWATER
 NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
    1       466.93   40.34      763.07    20800.00
    2        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) =      821.6
 LONGEST FLOWPATH FROM NODE  20800.00 TO NODE  20823.00 =   14651.10 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
```



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  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) =     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      Fp         Ap      SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 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                 B        1.07      0.75     0.100    56
 PUBLIC PARK                B        0.22      0.75     0.850    56
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 B        3.67      0.63     1.000    65
 SCHOOL                     B        0.34      0.75     0.600    56
 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.
  EQUIVALENT 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):
```

```
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82

****************************************************************************
  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  39.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  32.21
  PIPE-FLOW(CFS) =     556.93
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   0.63    Tc(MIN.) =  42.43
  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.) =   42.43
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.985
  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       10.70      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       31.03      0.75     0.700    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        0.52      0.63     1.000    65
  PUBLIC PARK                B        6.54      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= 0.30;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) = 0.71; 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 = 0.96; 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.
   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=.0318
  TIME OF PEAK FLOW(HR) = 16.58  RUNOFF VOLUME(AF) =     129.81
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =     573.19
  TOTAL AREA(ACRES) =      997.8       PEAK FLOW RATE(CFS) =     573.19

  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  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  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      Fp         Ap     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"                 B        0.52      0.63     1.000    65
  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.
   EQUIVALENT 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
```

```
----------------------------------------------------------------------------
  >>>>>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         Ap     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.
   EQUIVALENT 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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       24.73      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) =   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
```

```
  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= 0.30;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.
   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) = 16.67  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.

****************************************************************************
```



```
  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  2.28 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.
   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=.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  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      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        6.12      0.75     0.600    56   13.37
  COMMERCIAL                 B        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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        7.31      0.75     0.600    56
  COMMERCIAL                 B        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
```

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.17
  PIPE-FLOW(CFS) =      33.13
  *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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       23.09      0.75     0.600    56
  COMMERCIAL                 B        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) =      82.48

  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
```



```
  "3-4 DWELLINGS/ACRE"       B        2.67      0.75     0.600    56
  MOBILE HOME PARK           B        3.54      0.75     0.250    56
  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) =    9.62
  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      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        3.00      0.75     0.500    56   10.11
  COMMERCIAL                 B        5.71      0.75     0.100    56    7.90
  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) =     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
```

```
--------------------------------------------------------------------------------
  >>>>>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) =      21.99
  FLOW VELOCITY(FEET/SEC.) =   4.40   FLOW DEPTH(FEET) =   0.58
  TRAVEL TIME(MIN.) =   0.83   Tc(MIN.) =    8.72
  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.) =    8.72
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.544
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        3.16      0.75     0.250    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        2.28      0.75     0.500    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.36      0.75     0.600    56
  COMMERCIAL                 B        1.50      0.75     0.100    56
  PUBLIC PARK                B        0.63      0.75     0.850    56
  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) =   18.14
  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) =      38.74

  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  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) =      38.74
  FLOW VELOCITY(FEET/SEC.) =   4.78   FLOW DEPTH(FEET) =   0.74
  TRAVEL TIME(MIN.) =   0.87   Tc(MIN.) =    9.59
  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.) =    9.59
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.403
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        4.09      0.75     0.250    56
  PUBLIC PARK                B        1.15      0.75     0.850    56
  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 =  0.386
  SUBAREA AREA(ACRES) =    5.35      SUBAREA RUNOFF(CFS) =   10.18
  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) =      46.55

  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  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) =      46.55
  FLOW VELOCITY(FEET/SEC.) =   2.74   FLOW DEPTH(FEET) =   1.06
  TRAVEL TIME(MIN.) =   1.13   Tc(MIN.) =   10.72
  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.) =   10.72
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.248
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        2.82      0.75     0.250    56
  PUBLIC PARK                B        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) =    8.66
  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) =      51.86

  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  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) =      51.86
  FLOW VELOCITY(FEET/SEC.) =   2.39   FLOW DEPTH(FEET) =   1.20
  TRAVEL TIME(MIN.) =   1.35   Tc(MIN.) =   12.07
  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.) =   12.07
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.094
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK          B        0.75      0.75     0.250    56
  PUBLIC PARK               B        1.88      0.75     0.850    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"      B        0.24      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) =    2.87      SUBAREA RUNOFF(CFS) =    4.11
  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) =      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  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) =      51.90
  FLOW VELOCITY(FEET/SEC.) =   2.49   FLOW DEPTH(FEET) =   1.18
  TRAVEL TIME(MIN.) =   1.77   Tc(MIN.) =   13.84
  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.) =   13.84
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.929
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK          B        0.82      0.75     0.250    56
  PUBLIC PARK               B        2.06      0.75     0.850    56
  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 =  0.677
  SUBAREA AREA(ACRES) =    2.98      SUBAREA RUNOFF(CFS) =    3.82
  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) =      51.90
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.93; 24HR = 3.82

****************************************************************************
  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) =      51.90
  FLOW VELOCITY(FEET/SEC.) =   2.43   FLOW DEPTH(FEET) =   1.19
  TRAVEL TIME(MIN.) =   1.27   Tc(MIN.) =   15.11
  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.) =   15.11
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.830
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK          B        2.48      0.75     0.250    56
  PUBLIC PARK               B        2.79      0.75     0.850    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"      B        0.16      0.75     0.600    56
  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) =    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
  TOTAL AREA(ACRES) =       40.5       PEAK FLOW RATE(CFS) =      54.70
```

```
  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  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) =      54.70
  FLOW VELOCITY(FEET/SEC.) =   3.47   FLOW DEPTH(FEET) =   1.03
  TRAVEL TIME(MIN.) =   1.79   Tc(MIN.) =   16.89
  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.) =   16.89
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.711
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        0.62      0.75     0.250    56
  PUBLIC PARK                B        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) =    5.94
  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) =      56.32

  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  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) =      56.32
  FLOW VELOCITY(FEET/SEC.) =   5.57   FLOW DEPTH(FEET) =   0.82
  TRAVEL TIME(MIN.) =   0.97   Tc(MIN.) =   17.86
  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.) =   17.86
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.655
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK                B        1.44      0.75     0.850    56
  MOBILE HOME PARK           B        0.53      0.75     0.250    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.02      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) =    1.99      SUBAREA RUNOFF(CFS) =    2.04
  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) =      56.32
  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  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) =      66.33
    ***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.) =    6.90
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.88
  STREET FLOW TRAVEL TIME(MIN.) =   0.70   Tc(MIN.) =   18.56
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.617
  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        1.94      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
  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
  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.

****************************************************************************
  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
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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
```



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  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

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.76   HALFSTREET FLOOD WIDTH(FEET) =  31.20
  FLOW VELOCITY(FEET/SEC.) =  6.70   DEPTH*VELOCITY(FT*FT/SEC.) =   5.12
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 2619.3 FT WITH ELEVATION-DROP =  62.0 FT, IS  110.3 CFS,
         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 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  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.

****************************************************************************
  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 Ap =  0.54
  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
```

```
*******************************************************************************
  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 =     140.56
  ** CONFLUENCE DATA **
  STREAM      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1      1447.52   44.99     2763.54    20620.00
     2        86.96   12.81       57.40    20830.00
     3       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) =     2992.9
  LONGEST FLOWPATH FROM NODE  20620.00 TO NODE  20852.00 =   24422.29 FEET.
   EQUIVALENT 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) =     435.45
  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:
  TOTAL AREA(ACRES)     =     2992.9  TC(MIN.) =     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
```

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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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             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 20968                      *
* 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
  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
```



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 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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.372
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.293
  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
  ".4 DWELLING/ACRE"         B        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
  "2 DWELLINGS/ACRE"         B        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) =     16.63

  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)<<<<<
========================================================================
  UPSTREAM ELEVATION(FEET) = 1798.00  DOWNSTREAM ELEVATION(FEET) = 1770.00
```

```
  STREET LENGTH(FEET) =   427.68   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 =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      20.43
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.39
    HALFSTREET FLOOD WIDTH(FEET) =   13.12
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.56
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.16
  STREET FLOW TRAVEL TIME(MIN.) =   1.28   Tc(MIN.) =   11.65
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.138
  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        2.43      0.75     0.900    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.53      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        2.46      0.75     0.700    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.780
  SUBAREA AREA(ACRES) =    5.42      SUBAREA RUNOFF(CFS) =    7.59
  EFFECTIVE AREA(ACRES) =     15.90    AREA-AVERAGED Fm(INCH/HR) =  0.55
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.73
  TOTAL AREA(ACRES) =       15.9        PEAK FLOW RATE(CFS) =      22.76

  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) = 0.40   HALFSTREET FLOOD WIDTH(FEET) =  13.66
  FLOW VELOCITY(FEET/SEC.) =  5.73   DEPTH*VELOCITY(FT*FT/SEC.) =   2.29
  LONGEST FLOWPATH FROM NODE  20900.00 TO NODE  20902.00 =    1179.32 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20902.00 TO NODE  20903.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1770.00  DOWNSTREAM ELEVATION(FEET) = 1758.00
  STREET LENGTH(FEET) =   465.31   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

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



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  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      25.98
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.47
    HALFSTREET FLOOD WIDTH(FEET) =   17.34
    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
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.956
  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        2.12      0.75     0.900    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.54      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        2.53      0.75     0.700    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.771
  SUBAREA AREA(ACRES) =    5.19      SUBAREA RUNOFF(CFS) =    6.44
  EFFECTIVE AREA(ACRES) =     21.09    AREA-AVERAGED Fm(INCH/HR) =  0.56
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.74
  TOTAL AREA(ACRES) =       21.1        PEAK FLOW RATE(CFS) =      26.59

  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) = 0.48   HALFSTREET FLOOD WIDTH(FEET) =  17.49
  FLOW VELOCITY(FEET/SEC.) =  4.18   DEPTH*VELOCITY(FT*FT/SEC.) =   1.99
  LONGEST FLOWPATH FROM NODE  20900.00 TO NODE  20903.00 =    1644.63 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20903.00 TO NODE  20904.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  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

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      38.81
  ***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.) =    4.13
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.30
 STREET FLOW TRAVEL TIME(MIN.) =   1.96   Tc(MIN.) =   15.48
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.803
 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        3.95      0.75     0.900    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        2.03      0.75     0.600    56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B       15.54      0.75     0.700    56
 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) =   24.39
 EFFECTIVE AREA(ACRES) =     42.61    AREA-AVERAGED Fm(INCH/HR) =  0.55
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.73
 TOTAL AREA(ACRES) =       42.6        PEAK FLOW RATE(CFS) =      48.08

 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) = 0.59   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,
        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) =      60.36
```



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  ***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.) =    7.05
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.78
 STREET FLOW TRAVEL TIME(MIN.) =   1.56   Tc(MIN.) =   17.04
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.702
 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    56
 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) =   24.53
 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) =      68.74

 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
 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) =      76.25
   ***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.) =    6.73
```

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  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.04
 STREET FLOW TRAVEL TIME(MIN.) =   3.03   Tc(MIN.) =   20.07
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.543
 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        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) =   15.00
 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) =      74.19

 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   HALFSTREET FLOOD WIDTH(FEET) =  22.77
 FLOW VELOCITY(FEET/SEC.) =  6.68   DEPTH*VELOCITY(FT*FT/SEC.) =   3.98
 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) =      81.22
   ***STREET FLOWING FULL***
   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.) =   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
```



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      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        2.66      0.75     0.600    56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        8.47      0.75     0.700    56
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 B        0.16      0.63     1.000    65
 RESIDENTIAL
 ".4 DWELLING/ACRE"         B        7.50      0.75     0.900    56
 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) =   14.06
 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) =      77.80

 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) = 0.58   HALFSTREET FLOOD WIDTH(FEET) =  22.22
 FLOW VELOCITY(FEET/SEC.) =  7.33   DEPTH*VELOCITY(FT*FT/SEC.) =   4.29
 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.) =   23.47
 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
 TOTAL STREAM AREA(ACRES) =     102.82
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      77.80

****************************************************************************
 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
 *  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
      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"         B        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) =      8.19
  TOTAL AREA(ACRES) =      5.57   PEAK FLOW RATE(CFS) =      8.19

  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) =       8.19
  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      Fp         Ap     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    56
  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) =      15.46

  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
```



```
  CHANNEL FLOW THRU SUBAREA(CFS) =      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      Fp         Ap     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    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) =   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) =      25.23

  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) =      25.23
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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) =    8.51
  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) =      29.69

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70

****************************************************************************
  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) =      29.69
  FLOW VELOCITY(FEET/SEC.) =   2.32   FLOW DEPTH(FEET) =   0.51
  TRAVEL TIME(MIN.) =   4.62   Tc(MIN.) =   21.26
  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.) =   21.26
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.491
  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        3.54      0.75     0.900    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.59      0.75     0.600    56
  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) =    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) =      29.69
  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  20915.00 TO NODE  20916.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1720.00  DOWNSTREAM ELEVATION(FEET) = 1700.00
  STREET LENGTH(FEET) =   683.96   CURB HEIGHT(INCHES) =  6.0
```



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  STREET HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      37.22
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.51
    HALFSTREET FLOOD WIDTH(FEET) =   18.50
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.91
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.50
  STREET FLOW TRAVEL TIME(MIN.) =   2.32   Tc(MIN.) =   23.58
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.401
  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        1.86      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B       20.51      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) =   22.37      SUBAREA RUNOFF(CFS) =   15.03
  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) =      38.48

  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) =  18.74
  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.

****************************************************************************
  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 HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
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  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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         Ap     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) =      48.28

  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) =      54.56
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
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    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      Fp         Ap     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    56
  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) =      59.14
    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      Fp         Ap     SCS
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     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"                 B        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) =    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) =      69.06
    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      Fp         Ap     SCS
     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    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.72
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  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) =      71.14

  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 =      71.14

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   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
      2      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)<<
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==============================================================================
  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
  DEPTH OF FLOW IN  57.0 INCH PIPE IS  25.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.63
  PIPE-FLOW(CFS) =     148.94
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   0.69    Tc(MIN.) =  24.16
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.381
  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"                B        0.05      0.63     1.000    65
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"      B       11.48      0.75     0.600    56
  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) =   52.97
  EFFECTIVE AREA(ACRES) =    277.94    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) =     202.18

  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) =  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) =   53.24
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.61
    HALFSTREET FLOOD WIDTH(FEET) =   22.69
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.99
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.05

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      202.18   24.16    1.381  0.74( 0.57) 0.77     277.9   20900.00
      2      157.52   34.29    1.119  0.74( 0.58) 0.78     324.2   20910.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     202.18  Tc(MIN.) =   24.16
  AREA-AVERAGED Fm(INCH/HR) =  0.57  AREA-AVERAGED Fp(INCH/HR) =  0.74
  AREA-AVERAGED Ap =  0.77  EFFECTIVE AREA(ACRES) =     277.94
```



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  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  31.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.64
  PIPE-FLOW(CFS) =     202.18
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   1.46    Tc(MIN.) =  25.62
  LONGEST FLOWPATH FROM NODE  20910.00 TO NODE  20922.00 =    8456.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20922.00 TO NODE  20922.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   25.62
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.333
  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       10.56      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"        B       31.42      0.75     0.700    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"      B       17.53      0.75     0.500    56
  MOBILE HOME PARK          B       16.71      0.75     0.250    56
  COMMERCIAL                B        2.07      0.75     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.530
  SUBAREA AREA(ACRES) =   78.29      SUBAREA RUNOFF(CFS) =   66.01
  EFFECTIVE AREA(ACRES) =    356.23   AREA-AVERAGED Fm(INCH/HR) =  0.61
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.83
  TOTAL AREA(ACRES) =      402.4       PEAK FLOW RATE(CFS) =     230.51

  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)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      255.38   25.71    1.330  0.74( 0.53) 0.72     356.2   20900.00
      2      197.17   35.94    1.088  0.74( 0.54) 0.73     402.4   20910.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     255.38  Tc(MIN.) =   25.71
  AREA-AVERAGED Fm(INCH/HR) =  0.53  AREA-AVERAGED Fp(INCH/HR) =  0.74
  AREA-AVERAGED Ap =  0.72  EFFECTIVE AREA(ACRES) =     356.23
```

```
****************************************************************************
  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      Fp         Ap     SCS
       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    56
  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 Tc :
  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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      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
  NEW PEAK FLOW DATA ARE:
```



```
  PEAK FLOW RATE(CFS) =     274.21  Tc(MIN.) =   26.66
  AREA-AVERAGED Fm(INCH/HR) =  0.52  AREA-AVERAGED Fp(INCH/HR) =  0.74
  AREA-AVERAGED Ap =  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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    56
  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) =     295.89

  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)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      296.55   27.59    1.275  0.75( 0.52) 0.69     434.3   20900.00
      2      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) =     434.27

****************************************************************************
  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) =    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        2.86      0.75     0.500    56
  SCHOOL                     B        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 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
  "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         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) =    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
```

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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       12.11      0.75     0.600    56
  SCHOOL                     B       22.59      0.75     0.600    56
  PUBLIC PARK                B        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) =   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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       26.74      0.75     0.600    56
  PUBLIC PARK                B        9.16      0.75     0.850    56
  SCHOOL                     B        6.76      0.75     0.600    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        6.64      0.63     1.000    65
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        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
```

```
  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  18.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.63
  PIPE-FLOW(CFS) =      87.09
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   0.82    Tc(MIN.) =  22.70
  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.) =   22.70
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.433
  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       67.33      0.75     0.600    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        8.70      0.63     1.000    65
  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) =   65.96
  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) =     150.20

  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  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
  FLOWDEPTH IN BOX IS  2.99 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  16.77
  BOX-FLOW(CFS) =     150.20
  BOX-FLOW TRAVEL TIME(MIN.) =   0.79    Tc(MIN.) =   23.49
  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.) =   23.49
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.404
  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      101.89      0.75     0.600    56
  COMMERCIAL                 B        1.19      0.75     0.100    56
  MOBILE HOME PARK           B       18.61      0.75     0.250    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        2.78      0.75     0.500    56
  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) =  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) =     257.59

  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  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
  FLOWDEPTH IN BOX IS  2.90 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  22.23
  BOX-FLOW(CFS) =     257.59
  BOX-FLOW TRAVEL TIME(MIN.) =   0.53    Tc(MIN.) =   24.03
  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.) =   24.03
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.385
  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        6.69      0.75     0.600    56
  MOBILE HOME PARK           B       28.27      0.75     0.250    56
  COMMERCIAL                 B        1.13      0.75     0.100    56
  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) =   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
  TOTAL AREA(ACRES) =      335.1       PEAK FLOW RATE(CFS) =     289.99

  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  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) =    4.48
  ASSUME FULL-FLOWING BOX   BOX-FLOW VELOCITY(FEET/SEC.) =  16.18
  BOX-FLOW(CFS) =     289.99
  BOX-FLOW TRAVEL TIME(MIN.) =   1.01    Tc(MIN.) =   25.04
  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.) =   25.04
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.351
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        3.30      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       20.77      0.75     0.600    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B       10.89      0.75     0.500    56
  MOBILE HOME PARK           B       29.98      0.75     0.250    56
  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) =   61.66
  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) =     341.42

  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  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) =    7.67
  ASSUME FULL-FLOWING BOX   BOX-FLOW VELOCITY(FEET/SEC.) =  11.12
  BOX-FLOW(CFS) =     341.42
  BOX-FLOW TRAVEL TIME(MIN.) =   1.00    Tc(MIN.) =   26.04
  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.) =   26.04
```



```
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.320
  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        6.87      0.75     0.500    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.91      0.75     0.600    56
  SCHOOL                     B        3.23      0.75     0.600    56
  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) =    9.10
  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) =     341.42
  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<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   26.04
  RAINFALL INTENSITY(INCH/HR) =   1.32
  AREA-AVERAGED Fm(INCH/HR) =  0.40
  AREA-AVERAGED Fp(INCH/HR) =  0.74
  AREA-AVERAGED Ap =  0.54
  EFFECTIVE STREAM AREA(ACRES) =     411.05
  TOTAL STREAM AREA(ACRES) =     411.05
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     341.42

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      296.55   28.74    1.244  0.75( 0.51) 0.69     449.2   20900.00
      1      229.42   38.87    1.038  0.74( 0.52) 0.70     495.5   20910.00
      2      341.42   26.04    1.320  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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      637.97   26.04    1.320  0.74( 0.46) 0.62     818.1   20930.00
      2      609.72   28.74    1.244  0.74( 0.46) 0.62     860.3   20900.00
      3      465.84   38.87    1.038  0.74( 0.47) 0.63     906.5   20910.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     637.97    Tc(MIN.) =    26.04
  EFFECTIVE AREA(ACRES) =     818.08   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= 0.30;30M= 0.61;1H= 0.80;3H= 1.37;6H= 1.92;24H= 3.70
  S-GRAPH: VALLEY(DEV.)= 81.6%;VALLEY(UNDEV.)/DESERT= 18.4%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  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.
  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=.0474; Lca/L=0.4,n=.0425; Lca/L=0.5,n=.0391;Lca/L=0.6,n=.0364
  TIME OF PEAK FLOW(HR) = 16.58  RUNOFF VOLUME(AF) =     129.18
  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
   (UPSTREAM NODE PEAK FLOW RATE(CFS) =    637.97)
  PEAK FLOW RATE(CFS) USED =    637.97

****************************************************************************
  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) =   10.42
  ASSUME FULL-FLOWING BOX   BOX-FLOW VELOCITY(FEET/SEC.) =  15.30
  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  20940.00 TO NODE  20940.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   41.71
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.995
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  SCHOOL                     B       57.18      0.75     0.600    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       27.41      0.75     0.600    56
  MOBILE HOME PARK           B        4.75      0.75     0.250    56
  COMMERCIAL                 B        4.99      0.75     0.100    56
```



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  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= 0.30;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%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  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.
  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=.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
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =     610.52
  TOTAL AREA(ACRES) =     1000.8       PEAK FLOW RATE(CFS) =     637.97
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70

****************************************************************************
  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) =     1554.74    Tc(MIN.) =   44.99
  AREA-AVERAGED Fm(INCH/HR) =  0.49    Ybar = 0.58
  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) =     1554.74    Tc(MIN.) =   44.99
  AREA-AVERAGED Fm(INCH/HR) =  0.49    Ybar = 0.58
  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  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
----------------------------------------------------------------------------
```



```
  >>>>>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  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 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.)
  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
```

```
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.01700
  MAXIMUM DEPTH(FEET) =   1.00
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.413
  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        0.46      0.75     0.600    56
  MOBILE HOME PARK           B        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) =     14.38
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.59
  AVERAGE FLOW DEPTH(FEET) =   0.49   FLOOD WIDTH(FEET) =   19.06
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.48   Tc(MIN.) =    9.53
  SUBAREA AREA(ACRES) =    3.02       SUBAREA RUNOFF(CFS) =    5.94
  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) =      16.96

  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 "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.51   FLOOD WIDTH(FEET) =   21.45
  FLOW VELOCITY(FEET/SEC.) =   6.55   DEPTH*VELOCITY(FT*FT/SEC) =   3.32
  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
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.317
  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        1.20      0.75     0.600    56
  MOBILE HOME PARK           B        1.83      0.75     0.250    56
  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
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.10
  AVERAGE FLOW DEPTH(FEET) =   0.56   FLOOD WIDTH(FEET) =   27.57
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.67   Tc(MIN.) =   10.20
  SUBAREA AREA(ACRES) =    3.03       SUBAREA RUNOFF(CFS) =    5.52
  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) =      21.73
```



```
  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 "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.57   FLOOD WIDTH(FEET) =   29.06
  FLOW VELOCITY(FEET/SEC.) =   5.14   DEPTH*VELOCITY(FT*FT/SEC) =   2.94
  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
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.188
  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        3.52      0.75     0.600    56
  MOBILE HOME PARK           B        0.19      0.75     0.250    56
  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) =     24.66
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.28
  AVERAGE FLOW DEPTH(FEET) =   0.62   FLOOD WIDTH(FEET) =   34.74
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.02   Tc(MIN.) =   11.21
  SUBAREA AREA(ACRES) =    3.71       SUBAREA RUNOFF(CFS) =    5.85
  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) =      26.24

  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 "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.63   FLOOD WIDTH(FEET) =   35.78
  FLOW VELOCITY(FEET/SEC.) =   4.32   DEPTH*VELOCITY(FT*FT/SEC) =   2.71
  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   9.8 INCHES
```

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.47
  PIPE-FLOW(CFS) =      26.24
  *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      Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK               B        0.07      0.75     0.850    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"      B        7.87      0.75     0.600    56
  MOBILE HOME PARK          B        1.54      0.75     0.250    56
  COMMERCIAL                B        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      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1      1927.36   46.58     3993.76    20620.00
     2        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%
```



```
  Tc(HR) = 0.78; 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) =     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
```

```
  FLOW VELOCITY(FEET/SEC.) =  24.74   FLOW DEPTH(FEET) =   4.30
  TRAVEL TIME(MIN.) =   0.26   Tc(MIN.) =   54.45
  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) =     2190.53    Tc(MIN.) =   54.45
  AREA-AVERAGED Fm(INCH/HR) =  0.55    Ybar = 0.62
  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) =     1935.20    Tc(MIN.) =   46.58
  AREA-AVERAGED Fm(INCH/HR) =  0.48    Ybar = 0.58
  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= 0.30;30M= 0.62;1H= 0.81;3H= 1.42;6H= 2.05;24H= 4.21
  S-GRAPH: VALLEY(DEV.)= 68.9%;VALLEY(UNDEV.)/DESERT= 31.1%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.91; LAG(HR) = 0.73; Fm(INCH/HR) = 0.52; Ybar = 0.61
  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=.0325; Lca/L=0.4,n=.0291; Lca/L=0.5,n=.0267;Lca/L=0.6,n=.0249
  TIME OF PEAK FLOW(HR) = 16.75  RUNOFF VOLUME(AF) =    1427.50
  PEAK FLOW RATE(CFS) =    3350.10

****************************************************************************
  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  4.92 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  29.63
  BOX-FLOW(CFS) =    3350.10
  BOX-FLOW TRAVEL TIME(MIN.) =   0.37    Tc(MIN.) =   54.83
  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.) =   54.83
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.844
  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        5.80      0.75      0.600    56
  COMMERCIAL                  B       17.13      0.75      0.100    56
  PUBLIC PARK                 B        0.39      0.75      0.850    56
  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= 0.30;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%
           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
  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.
   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) = 16.75  RUNOFF VOLUME(AF) =    1432.94
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    3339.72
  TOTAL AREA(ACRES) =    10049.7       PEAK FLOW RATE(CFS) =    3350.10
  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  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  4.79 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  30.43
  BOX-FLOW(CFS) =    3350.10
  BOX-FLOW TRAVEL TIME(MIN.) =   0.51    Tc(MIN.) =   55.33
  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.) =   55.33
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.840
```

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 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        2.51      0.75     0.600    56
 COMMERCIAL                 B        3.07      0.75     0.100    56
 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= 0.30;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%
          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
 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=.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) =    1434.11
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    3313.62
 TOTAL AREA(ACRES) =    10055.3       PEAK FLOW RATE(CFS) =    3350.10
 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  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) =    3350.10    Tc(MIN.) =   55.33
 AREA-AVERAGED Fm(INCH/HR) =  0.52   Ybar = 0.60
 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
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.327
 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
 "5-7 DWELLINGS/ACRE"       B        3.18      0.75     0.500    56   12.95
 COMMERCIAL                 B        4.70      0.75     0.100    56   10.12
```



```
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        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) =     16.66
 TOTAL AREA(ACRES) =      8.79   PEAK FLOW RATE(CFS) =     16.66

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70

****************************************************************************
 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
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =      20.20
   ***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.) =    1.99
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.14
 STREET FLOW TRAVEL TIME(MIN.) =   2.35   Tc(MIN.) =   12.47
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.054
 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        1.51      0.75     0.500    56
 COMMERCIAL                 B        2.33      0.75     0.100    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        0.44      0.75     0.600    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.293
 SUBAREA AREA(ACRES) =    4.28      SUBAREA RUNOFF(CFS) =    7.07
 EFFECTIVE AREA(ACRES) =     13.07    AREA-AVERAGED Fm(INCH/HR) =  0.22
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.30
 TOTAL AREA(ACRES) =       13.1        PEAK FLOW RATE(CFS) =      21.56

 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) = 0.58   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) =      24.36
    ***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
  COMMERCIAL                 B        1.91      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) =      25.41

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70

  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
```



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----------------------------------------------------------------------------
  >>>>>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) =      27.94
    ***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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        1.22      0.75     0.500    56
  COMMERCIAL                 B        1.94      0.75     0.100    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 =  0.298
  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
```

```
  STREET HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      30.94
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.69
    HALFSTREET FLOOD WIDTH(FEET) =   27.29
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.98
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.36
  STREET FLOW TRAVEL TIME(MIN.) =   1.70   Tc(MIN.) =   17.56
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.672
  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"       A        0.14      0.98     0.500    32
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        1.29      0.75     0.500    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.85      0.75     0.600    56
  COMMERCIAL                 B        1.55      0.75     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.76
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.360
  SUBAREA AREA(ACRES) =    3.83      SUBAREA RUNOFF(CFS) =    4.82
  EFFECTIVE AREA(ACRES) =     24.22    AREA-AVERAGED Fm(INCH/HR) =  0.23
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.31
  TOTAL AREA(ACRES) =       24.2        PEAK FLOW RATE(CFS) =      31.42

  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) = 0.69   HALFSTREET FLOOD WIDTH(FEET) =  27.41
  FLOW VELOCITY(FEET/SEC.) =  1.99   DEPTH*VELOCITY(FT*FT/SEC.) =   1.37
  LONGEST FLOWPATH FROM NODE  20960.00 TO NODE  20965.00 =    1808.10 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20965.00 TO NODE  20966.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  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
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  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      34.24
    ***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.) =    2.02
    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A        0.74      0.98     0.500    32
  COMMERCIAL                 B        0.93      0.75     0.100    56
  COMMERCIAL                 B        2.70      0.75     0.100    56
  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) =      35.09

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.37; 6HR = 1.92; 24HR = 3.70

  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) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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
```

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  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      38.69
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.72
  HALFSTREET FLOOD WIDTH(FEET) =   28.82
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.23
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.60
 STREET FLOW TRAVEL TIME(MIN.) =   2.55   Tc(MIN.) =   21.82
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.468
 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"       A        2.02      0.98     0.500    32
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"       B        0.32      0.75     0.500    56
 COMMERCIAL                 A        0.04      0.98     0.100    32
 COMMERCIAL                 B        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) =    7.20
 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) =      39.36

 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) =  29.00
 FLOW VELOCITY(FEET/SEC.) =  2.24   DEPTH*VELOCITY(FT*FT/SEC.) =   1.61
 *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
 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  17.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  10.54
 PIPE-FLOW(CFS) =      39.36
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME(MIN.) =   2.90    Tc(MIN.) =  24.73
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.362
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B       13.57      0.75     0.100    56
```



```
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        3.04      0.75     0.600    56
 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) =   18.22
 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) =      54.24

 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) =  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) =   14.88
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.48
   HALFSTREET FLOOD WIDTH(FEET) =   15.89
   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.

****************************************************************************
 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.) =   24.73
 RAINFALL INTENSITY(INCH/HR) =   1.36
 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 =      54.24
 ** CONFLUENCE DATA **
 STREAM      Q        Tc      AREA      HEADWATER
 NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
    1      3350.10   55.33    10055.32    20120.00
    2        54.24   24.73       51.61    20960.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 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.)= 69.2%;VALLEY(UNDEV.)/DESERT= 30.8%
          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
  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=.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 =  0.60
  PEAK FLOW RATE(CFS)   =   3350.10
============================================================================
============================================================================
  END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

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 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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                          Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* 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
     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
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 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
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.121
  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
  "3-4 DWELLINGS/ACRE"       B        5.92      0.75      0.600    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) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      15.01
    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        7.03      0.75     0.600    56
  SCHOOL                     B        7.98      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) =   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 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
  "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
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  21011.00 TO NODE  21012.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1462.00  DOWNSTREAM ELEVATION(FEET) = 1440.00
  STREET LENGTH(FEET) =   809.73   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) =   0.83

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.28
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.39
    HALFSTREET FLOOD WIDTH(FEET) =   13.12
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.61
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.40
  STREET FLOW TRAVEL TIME(MIN.) =   3.74   Tc(MIN.) =   16.37
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.744
  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        4.37      0.75     0.600    56
  SCHOOL                     B        1.10      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) =    5.47      SUBAREA RUNOFF(CFS) =    6.38
  EFFECTIVE AREA(ACRES) =     12.52    AREA-AVERAGED Fm(INCH/HR) =  0.45
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.60
  TOTAL AREA(ACRES) =       12.5        PEAK FLOW RATE(CFS) =      14.60

  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) = 0.40   HALFSTREET FLOOD WIDTH(FEET) =  13.66
  FLOW VELOCITY(FEET/SEC.) =  3.68   DEPTH*VELOCITY(FT*FT/SEC.) =   1.47
  LONGEST FLOWPATH FROM NODE  21010.00 TO NODE  21012.00 =    1721.33 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21012.00 TO NODE  21013.00 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) =   312.07   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00
```



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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      16.01
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.42
    HALFSTREET FLOOD WIDTH(FEET) =   14.76
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.49
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.47
  STREET FLOW TRAVEL TIME(MIN.) =   1.49   Tc(MIN.) =   17.86
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.655
  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        0.66      0.75     0.600    56
  SCHOOL                     B        1.95      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) =    2.61      SUBAREA RUNOFF(CFS) =    2.83
  EFFECTIVE AREA(ACRES) =     15.13    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) =      16.43

  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) = 0.42   HALFSTREET FLOOD WIDTH(FEET) =  14.91
  FLOW VELOCITY(FEET/SEC.) =  3.51   DEPTH*VELOCITY(FT*FT/SEC.) =   1.49
  LONGEST FLOWPATH FROM NODE  21010.00 TO NODE  21013.00 =    2033.40 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21013.00 TO NODE  21013.00 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.) =   17.86
  RAINFALL INTENSITY(INCH/HR) =   1.66
  AREA-AVERAGED Fm(INCH/HR) =  0.45
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.60
  EFFECTIVE STREAM AREA(ACRES) =      15.13
  TOTAL STREAM AREA(ACRES) =      15.13
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      16.43

  ** CONFLUENCE DATA **
```

```
 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

  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       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:
  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.

****************************************************************************
  FLOW PROCESS FROM NODE  21013.00 TO NODE  21014.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  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
  LONGEST FLOWPATH FROM NODE  21000.00 TO NODE  21014.00 =    4024.57 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21014.00 TO NODE  21014.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   21.51
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.481
  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       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) =   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):
```



```
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44

****************************************************************************
  FLOW PROCESS FROM NODE  21014.00 TO NODE  21015.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  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
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      68.98
    ***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.) =    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
  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
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.361
  SUBAREA AREA(ACRES) =   13.54      SUBAREA RUNOFF(CFS) =   13.05
  EFFECTIVE AREA(ACRES) =     79.98    AREA-AVERAGED Fm(INCH/HR) =  0.41
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.55
  TOTAL AREA(ACRES) =       80.6        PEAK FLOW RATE(CFS) =      67.17

  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) = 0.61   HALFSTREET FLOOD WIDTH(FEET) =  23.38
  FLOW VELOCITY(FEET/SEC.) =  5.76   DEPTH*VELOCITY(FT*FT/SEC.) =   3.50
  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) =      71.02
   ***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.) =    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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        1.76      0.75     0.600    56
 SCHOOL                     B        3.85      0.75     0.600    56
 MOBILE HOME PARK           B        2.60      0.75     0.250    56
 PUBLIC PARK                B        0.44      0.75     0.850    56
 COMMERCIAL                 B        0.91      0.75     0.100    56
 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) =      67.85

 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
```



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 AREA-AVERAGED Ap =  0.54
 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      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        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) =      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
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 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.762
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      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) =    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) =      15.23

 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      Fp         Ap     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    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.311
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 SUBAREA AREA(ACRES) =    7.88      SUBAREA RUNOFF(CFS) =   10.47
 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         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 MOBILE HOME PARK           B        6.35      0.75     0.250    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        0.47      0.75     0.600    56
 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:
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  DEPTH(FEET) = 0.46   HALFSTREET FLOOD WIDTH(FEET) =  16.48
  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.

****************************************************************************
  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) =      37.61
    ***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.) =    4.99
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.54
  STREET FLOW TRAVEL TIME(MIN.) =   1.30   Tc(MIN.) =   18.96
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.597
  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        4.17      0.75     0.600    56
  MOBILE HOME PARK           B        3.23      0.75     0.250    56
  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) =    8.41
  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) =      40.19

  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) = 0.52   HALFSTREET FLOOD WIDTH(FEET) =  18.87
  FLOW VELOCITY(FEET/SEC.) =  5.12   DEPTH*VELOCITY(FT*FT/SEC.) =   2.65
  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<<<<<
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  >>>>>(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) =      42.10
    ***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.) =    4.01
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.33
  STREET FLOW TRAVEL TIME(MIN.) =   1.48   Tc(MIN.) =   20.45
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.526
  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        1.32      0.75     0.600    56
  COMMERCIAL                 B        1.20      0.75     0.100    56
  MOBILE HOME PARK           B        0.81      0.75     0.250    56
  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) =    3.82
  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) =      41.90

  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) = 0.58   HALFSTREET FLOOD WIDTH(FEET) =  22.04
  FLOW VELOCITY(FEET/SEC.) =  4.01   DEPTH*VELOCITY(FT*FT/SEC.) =   2.33
  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
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  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      45.17
    ***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.) =    5.37
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.86
  STREET FLOW TRAVEL TIME(MIN.) =   1.10   Tc(MIN.) =   21.55
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.479
  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        2.67      0.75     0.600    56
  COMMERCIAL                 B        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) =    6.54
  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) =      46.88

  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.) =  5.42   DEPTH*VELOCITY(FT*FT/SEC.) =   2.91
  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
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    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      49.60
    ***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.) =    4.72
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.75
  STREET FLOW TRAVEL TIME(MIN.) =   1.09   Tc(MIN.) =   22.64
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.436
  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        2.72      0.75     0.600    56
  COMMERCIAL                 B        2.05      0.75     0.100    56
  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) =    5.43
  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) =      50.66

  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) = 0.59   HALFSTREET FLOOD WIDTH(FEET) =  22.28
  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.

****************************************************************************
  FLOW PROCESS FROM NODE  21028.00 TO NODE  21029.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
============================================================================
  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

  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) =      53.30
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.64
    HALFSTREET FLOOD WIDTH(FEET) =   20.00
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.57
```

```
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.92
 STREET FLOW TRAVEL TIME(MIN.) =   1.10   Tc(MIN.) =   23.74
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.395
 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        2.13      0.75     0.600    56
 COMMERCIAL                 B        2.11      0.75     0.100    56
 MOBILE HOME PARK           B        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) =    5.29
 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) =      54.22

 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) = 0.64   HALFSTREET FLOOD WIDTH(FEET) =  20.00
 FLOW VELOCITY(FEET/SEC.) =  4.61   DEPTH*VELOCITY(FT*FT/SEC.) =   2.96
 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) =      72.51
   ***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.) =    6.60
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.91
 STREET FLOW TRAVEL TIME(MIN.) =   0.91   Tc(MIN.) =   24.65
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.364
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B        9.68      0.75     0.100    56
```



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 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) =   36.58
 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) =      89.31

 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) =  24.48
 FLOW VELOCITY(FEET/SEC.) =  7.02   DEPTH*VELOCITY(FT*FT/SEC.) =   4.42
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  360.4 FT WITH ELEVATION-DROP =  13.0 FT, IS   99.1 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  1.11 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  13.40
 BOX-FLOW(CFS) =      89.31
 BOX-FLOW TRAVEL TIME(MIN.) =   0.59    Tc(MIN.) =   25.24
 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.) =   25.24
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.345
 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        2.14      0.75     0.600    56
 COMMERCIAL                 B        3.35      0.75     0.100    56
 SCHOOL                     B        0.63      0.75     0.600    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.326
 SUBAREA AREA(ACRES) =    6.12      SUBAREA RUNOFF(CFS) =    6.06
 EFFECTIVE AREA(ACRES) =     98.68   AREA-AVERAGED Fm(INCH/HR) =  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.39
 TOTAL AREA(ACRES) =       98.7        PEAK FLOW RATE(CFS) =      93.78

 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 =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   25.24
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.345
  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        0.62      0.75     0.600    56
  SCHOOL                     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) =    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      Tc   Intensity   Fp(Fm)     Ap     Ae     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)     Ap     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     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.84      0.75     0.600    56
  SCHOOL                     B        2.77      0.75     0.600    56
  COMMERCIAL                 B        2.00      0.75     0.100    56
  MOBILE HOME PARK           B        6.89      0.75     0.250    56
  PUBLIC PARK                B        1.56      0.75     0.850    56
  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
      2      165.46   29.19    1.233  0.75( 0.34) 0.46     206.2   21010.00
      3      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
```

```
****************************************************************************
  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 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        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 Streetflow Section(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) =      26.88
    ***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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.00      0.75     0.600    56
  COMMERCIAL                 B        5.39      0.75     0.100    56
  SCHOOL                     B        1.37      0.75     0.600    56
  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      Fp         Ap     SCS
```

```
     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
  SCHOOL                   B        2.94      0.75      0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.590
  SUBAREA AREA(ACRES) =    5.56      SUBAREA RUNOFF(CFS) =    6.41
  EFFECTIVE AREA(ACRES) =     27.60   AREA-AVERAGED Fm(INCH/HR) =  0.28
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.37
  TOTAL AREA(ACRES) =       27.6       PEAK FLOW RATE(CFS) =      35.87

  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  21043.00 TO NODE  21043.00 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.) =   16.71
  RAINFALL INTENSITY(INCH/HR) =   1.72
  AREA-AVERAGED Fm(INCH/HR) =  0.28
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.37
  EFFECTIVE STREAM AREA(ACRES) =      27.60
  TOTAL STREAM AREA(ACRES) =      27.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      35.87

  ** CONFLUENCE DATA **
   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
      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
      2       35.87   16.71    1.722  0.75( 0.28) 0.37      27.6   21040.00

  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      194.17   16.71    1.722  0.75( 0.33) 0.44     154.6   21040.00
      2      200.65   25.69    1.331  0.75( 0.33) 0.44     222.8   21020.00
      3      189.17   29.19    1.233  0.75( 0.33) 0.45     233.8   21010.00
      4      187.57   29.57    1.223  0.75( 0.33) 0.45     234.4   21000.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     200.65    Tc(MIN.) =    25.69
  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  21043.00 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) =  1327.00  DOWNSTREAM(FEET) =  1318.00
  FLOW LENGTH(FEET) =   665.51   MANNING'S N =  0.014
  GIVEN BOX BASEWIDTH(FEET) =  12.00   GIVEN BOX HEIGHT(FEET) =   2.50
  FLOWDEPTH IN BOX IS  1.30 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  12.86
  BOX-FLOW(CFS) =     200.65
  BOX-FLOW TRAVEL TIME(MIN.) =   0.86    Tc(MIN.) =   26.55
  LONGEST FLOWPATH FROM NODE  21000.00 TO NODE  21044.00 =    7328.48 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21044.00 TO NODE  21044.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   26.55
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.305
  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        4.70      0.75      0.600    56
  COMMERCIAL                 B       13.39      0.75      0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.230
  SUBAREA AREA(ACRES) =   18.09      SUBAREA RUNOFF(CFS) =   18.44
  EFFECTIVE AREA(ACRES) =    240.93   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) =     213.86

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.34; 6HR = 1.85; 24HR = 3.44

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      211.75   17.54    1.673  0.75( 0.31) 0.42     172.7   21040.00
      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
      4      200.72   30.29    1.206  0.75( 0.32) 0.43     252.5   21000.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     214.41  Tc(MIN.) =   26.47
  AREA-AVERAGED Fm(INCH/HR) =  0.32  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.43  EFFECTIVE AREA(ACRES) =     240.93

****************************************************************************
  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) =     3350.10    Tc(MIN.) =   55.33
  AREA-AVERAGED Fm(INCH/HR) =  0.52    Ybar = 0.60
  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) =     3350.10    Tc(MIN.) =   55.33
  AREA-AVERAGED Fm(INCH/HR) =  0.52    Ybar = 0.60
  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  4.92 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  29.62
  BOX-FLOW(CFS) =    3350.10
  BOX-FLOW TRAVEL TIME(MIN.) =   0.64    Tc(MIN.) =   55.97
  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) =     3350.10    Tc(MIN.) =   55.97
  AREA-AVERAGED Fm(INCH/HR) =  0.52    Ybar = 0.60
  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
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      211.75   17.54    1.673  0.75( 0.31) 0.42     172.7   21040.00
      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
      4      200.72   30.29    1.206  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= 0.30;30M= 0.62;1H= 0.81;3H= 1.42;6H= 2.04;24H= 4.19
  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.
  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.
   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
  TIME OF PEAK FLOW(HR) = 16.75  RUNOFF VOLUME(AF) =    1488.52
  PEAK FLOW RATE(CFS) =    3381.38

****************************************************************************
  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) =    3381.38
  FLOW VELOCITY(FEET/SEC.) =  28.12   FLOW DEPTH(FEET) =   4.86
  TRAVEL TIME(MIN.) =   0.82   Tc(MIN.) =   56.80
  LONGEST 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<<<<<
================================================================================
  MAINLINE Tc(MIN.) =   56.80
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.827
  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"       A       25.15      0.98      0.500    32
  COMMERCIAL                 A       34.08      0.98      0.100    32
  SCHOOL                     A        9.02      0.98      0.600    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        6.36      0.98      0.600    32
  COMMERCIAL                 B       60.62      0.75      0.100    56
```

```
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       23.64      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.87
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.286
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  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= 4.18
  S-GRAPH: VALLEY(DEV.)= 70.4%;VALLEY(UNDEV.)/DESERT= 29.6%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  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
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =    10518.3
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21045.00 =   39604.08 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   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) =    1520.04
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    3418.66
  TOTAL AREA(ACRES) =    10518.3       PEAK FLOW RATE(CFS) =    3418.66

  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  21045.00 TO NODE  21046.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1295.00  DOWNSTREAM(FEET) =   1250.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =  2744.77   CHANNEL SLOPE =  0.0164
  CHANNEL BASE(FEET) =   15.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   7.50
  CHANNEL FLOW THRU SUBAREA(CFS) =    3418.66
  FLOW VELOCITY(FEET/SEC.) =  28.11   FLOW DEPTH(FEET) =   4.90
  TRAVEL TIME(MIN.) =   1.63   Tc(MIN.) =   58.42
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21046.00 =   42348.85 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21046.00 TO NODE  21046.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   58.42
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.813
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 A       22.52      0.98     0.100    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        7.83      0.98     0.600    32
  COMMERCIAL                 B       38.49      0.75     0.100    56
  PUBLIC PARK                A        8.61      0.98     0.850    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.45      0.75     0.600    56
```



```
  MOBILE HOME PARK           B        0.52      0.75     0.250    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.90
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.254
  * RAINFALL INTENSITY IS LESS THAN AREA-AVERAGED Fp;
  * IMPERVIOUS AREA USED FOR RUNOFF ESTIMATES.
  SUBAREA AREA(ACRES) =   82.42
  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.)= 70.6%;VALLEY(UNDEV.)/DESERT= 29.4%
           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.
  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
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21046.00 =   42348.85 FEET.
   EQUIVALENT 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) = 16.83  RUNOFF VOLUME(AF) =    1537.01
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    3461.47
  TOTAL AREA(ACRES) =    10600.7       PEAK FLOW RATE(CFS) =    3461.47

  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  21046.00 TO NODE  21069.00 IS CODE =  54
----------------------------------------------------------------------------
  >>>>>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
  CHANNEL BASE(FEET) =   18.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   9.00
  CHANNEL FLOW THRU SUBAREA(CFS) =    3461.47
  FLOW VELOCITY(FEET/SEC.) =  25.46   FLOW DEPTH(FEET) =   4.89
  TRAVEL TIME(MIN.) =   1.78   Tc(MIN.) =   60.20
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21069.00 =   45066.88 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21069.00 TO NODE  21069.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   60.20
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.798
  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        5.29      0.75     0.600    56
  COMMERCIAL                 B       24.38      0.75     0.100    56
  COMMERCIAL                 A        9.45      0.98     0.100    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        1.36      0.98     0.600    32
  PUBLIC PARK                A        5.30      0.98     0.850    32
  PUBLIC PARK                B        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
  * 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 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
  "5-7 DWELLINGS/ACRE"       A        2.98      0.98     0.500    32   12.02
  COMMERCIAL                 A        5.49      0.98     0.100    32    9.40
  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
```



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****************************************************************************
  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) =      26.28
    ***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         Ap     SCS
       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) =   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) =      32.35

  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)<<<<<
```

```
==========================================================================
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A        1.87      0.98     0.500    32
  COMMERCIAL                 A       17.40      0.98     0.100    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        1.43      0.98     0.600    32
  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
  STREET LENGTH(FEET) =  1432.84   CURB HEIGHT(INCHES) =  6.0
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  STREET HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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      Fp         Ap     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
  "5-7 DWELLINGS/ACRE"       B        5.92      0.75     0.500    56
  COMMERCIAL                 B        6.47      0.75     0.100    56
  COMMERCIAL                 A       13.55      0.98     0.100    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        1.00      0.98     0.600    32
  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<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
```

```
  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 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
  "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                 A        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) =     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
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    **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      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A        1.79      0.98     0.500    32
  COMMERCIAL                 A        7.48      0.98     0.100    32
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        1.27      0.98     0.600    32
  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
```

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 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.359
 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"       A        1.53      0.98     0.500    32
 COMMERCIAL                 A        4.98      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) =    7.19
 EFFECTIVE AREA(ACRES) =     27.21    AREA-AVERAGED Fm(INCH/HR) =  0.22
 AREA-AVERAGED Fp(INCH/HR) =  0.98  AREA-AVERAGED Ap =  0.23
 TOTAL AREA(ACRES) =       27.2        PEAK FLOW RATE(CFS) =      27.92

 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.) =  2.17   DEPTH*VELOCITY(FT*FT/SEC.) =   1.43
 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) =      32.66
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.55
   HALFSTREET FLOOD WIDTH(FEET) =   19.41
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.13
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.26
 STREET FLOW TRAVEL TIME(MIN.) =   1.31   Tc(MIN.) =   26.10
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.318
 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"       A        4.16      0.98     0.500    32
 COMMERCIAL                 A        5.34      0.98     0.100    32
```



```
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       A        0.77      0.98     0.600    32
 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) =    9.48
 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) =      36.39

 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) =  20.29
 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.

****************************************************************************
 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) =      40.44
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.62
   HALFSTREET FLOOD WIDTH(FEET) =   23.16
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.64
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.26
 STREET FLOW TRAVEL TIME(MIN.) =   1.35   Tc(MIN.) =   27.45
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.279
 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"       A        4.73      0.98     0.500    32
 COMMERCIAL                 A        3.54      0.98     0.100    32
 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) =    8.10
 EFFECTIVE AREA(ACRES) =     47.30    AREA-AVERAGED Fm(INCH/HR) =  0.26
 AREA-AVERAGED Fp(INCH/HR) =  0.98  AREA-AVERAGED Ap =  0.27
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  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) =      46.36
    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        2.04      0.98     0.600    32
  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) =    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.
```



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****************************************************************************
  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) =      44.60
    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        1.85      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.05      0.75     0.600    56
  COMMERCIAL                 A        0.62      0.98     0.100    32
  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<<<<<
============================================================================
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```
 TOTAL NUMBER OF STREAMS =  2
 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 =      43.50

 ** 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
     2       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      Tc   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      Fp         Ap     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"       B        5.09      0.75     0.600    56
 COMMERCIAL                 A       15.30      0.98     0.100    32
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 COMMERCIAL                 B       41.62      0.75     0.100    56
 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) = 39.00
 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) =   63.00
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.94
   HALFSTREET 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      Tc   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 =  0.013

 USER 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
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  PIPE-FLOW(CFS) =     199.96
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   2.44    Tc(MIN.) =  25.30
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.343
  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        1.21      0.75     0.600    56
  COMMERCIAL                 A       33.09      0.98     0.100    32
  PUBLIC PARK                B        0.04      0.75     0.850    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.93
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.118
  SUBAREA AREA(ACRES) =   34.34      SUBAREA RUNOFF(CFS) =   38.09
  EFFECTIVE AREA(ACRES) =    218.58    AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.92  AREA-AVERAGED Ap =  0.26
  TOTAL AREA(ACRES) =      246.2        PEAK FLOW RATE(CFS) =     217.84

  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) = 39.00
  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) =   17.89
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.64
    HALFSTREET FLOOD WIDTH(FEET) =   24.04
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.50
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.96

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      224.10   25.30    1.343  0.92( 0.20) 0.22     218.6   21050.00
      2      168.04   43.69    0.968  0.92( 0.21) 0.23     246.2   21060.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     224.10  Tc(MIN.) =   25.30
  AREA-AVERAGED Fm(INCH/HR) =  0.20  AREA-AVERAGED Fp(INCH/HR) =  0.92
  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  21069.00 TO NODE  21069.00 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
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   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      224.10   25.30    1.343  0.92( 0.20) 0.22     218.6   21050.00
      2      168.04   43.69    0.968  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) =     3461.47    Tc(MIN.) =   60.20
  AREA-AVERAGED Fm(INCH/HR) =  0.51    Ybar = 0.59
  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= 0.30;30M= 0.61;1H= 0.81;3H= 1.42;6H= 2.03;24H= 4.15
  S-GRAPH: VALLEY(DEV.)= 71.4%;VALLEY(UNDEV.)/DESERT= 28.6%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  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.
  DEPTH-AREA FACTORS: 5M = 0.66; 30M = 0.66; 1HR = 0.67;
  3HR = 0.94; 6HR = 0.97; 24HR= 0.98
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =    10893.4
  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) =    1598.78
  PEAK FLOW RATE(CFS) =    3521.80

****************************************************************************
  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) =    3521.80
  FLOW VELOCITY(FEET/SEC.) =  24.53   FLOW DEPTH(FEET) =   5.09
  TRAVEL TIME(MIN.) =   1.90   Tc(MIN.) =   62.10
  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.) =   62.10
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  0.784
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  COMMERCIAL                B      108.13      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"      B       17.27      0.75     0.600    56
  PUBLIC PARK               B        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.
   EQUIVALENT 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.) =     62.10
  AREA-AVERAGED Fm(INCH/HR)=  0.50   Ybar =  0.58
  PEAK FLOW RATE(CFS)   =   3521.80
============================================================================
============================================================================
  END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

```
 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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             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 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.   (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  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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.418
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.430
  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
  "3-4 DWELLINGS/ACRE"       B        0.91      0.75     0.600    56    9.42
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        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
  TOTAL AREA(ACRES) =      7.47   PEAK FLOW RATE(CFS) =     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
```

```
  MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      12.88
  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      Fp         Ap     SCS
       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    56
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.23      0.75     0.600    56
  RESIDENTIAL
```



```
  "2 DWELLINGS/ACRE"         B        8.43      0.75     0.700    56
  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) =   12.11
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       20.18      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.62      0.75     0.600    56
  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
```

```
  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) =      63.05
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.65
    HALFSTREET FLOOD WIDTH(FEET) =   24.45
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.11
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.31
  STREET FLOW TRAVEL TIME(MIN.) =   1.31   Tc(MIN.) =   17.49
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.676
  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        2.78      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.85      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.677
  SUBAREA AREA(ACRES) =    3.63      SUBAREA RUNOFF(CFS) =    3.82
  EFFECTIVE AREA(ACRES) =     58.19    AREA-AVERAGED Fm(INCH/HR) =  0.51
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.68
  TOTAL AREA(ACRES) =       58.2        PEAK FLOW RATE(CFS) =      61.14
  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) = 0.64   HALFSTREET FLOOD WIDTH(FEET) =  24.15
  FLOW VELOCITY(FEET/SEC.) =  5.07   DEPTH*VELOCITY(FT*FT/SEC.) =   3.25
  LONGEST FLOWPATH FROM NODE  21100.00 TO NODE  21105.00 =    2989.90 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21105.00 TO NODE  21106.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 18 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1705.00  DOWNSTREAM ELEVATION(FEET) = 1690.00
  STREET LENGTH(FEET) =   562.31   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) =   0.86

    **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         Ap     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    56
  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
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   HALFSTREET FLOOD WIDTH(FEET) =   22.46
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    6.24
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.79
 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         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B        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) =    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) =      65.10

 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) = 0.61   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
   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
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.464
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
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 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B       28.69      0.75     0.700    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        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      Fp         Ap     SCS
      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) =   18.05
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  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) =      98.74

  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        6.59      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.29      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) =    7.88      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) =      98.81

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44

  END OF SUBAREA STREET FLOW HYDRAULICS:
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  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      Fp         Ap     SCS
       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) =   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
```

```
  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 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
  "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) =     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         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.67      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       10.86      0.75     0.700    56
  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
```



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  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.69
  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      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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) =   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:
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```
  DEPTH(FEET) = 0.51   HALFSTREET FLOOD WIDTH(FEET) =  18.74
  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.

****************************************************************************
  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) =      47.28
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.48
    HALFSTREET FLOOD WIDTH(FEET) =   17.88
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    7.13
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.45
  STREET FLOW TRAVEL TIME(MIN.) =   1.11   Tc(MIN.) =   22.64
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.436
  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        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.

****************************************************************************
  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) =      49.47
    ***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.) =    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
  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        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) =    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<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   24.03
  RAINFALL INTENSITY(INCH/HR) =   1.39
  AREA-AVERAGED Fm(INCH/HR) =  0.51
  AREA-AVERAGED Fp(INCH/HR) =  0.75
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  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 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        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
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  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
       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) =   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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        6.40      0.75     0.700    56
  RESIDENTIAL
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  "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) =   11.92      SUBAREA RUNOFF(CFS) =   11.57
  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) =      30.78

  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) = 0.45   HALFSTREET FLOOD WIDTH(FEET) =  16.01
  FLOW VELOCITY(FEET/SEC.) =  5.74   DEPTH*VELOCITY(FT*FT/SEC.) =   2.56
  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
  STREET HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      34.52
    ***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.) =    4.53
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.31
  STREET FLOW TRAVEL TIME(MIN.) =   2.97   Tc(MIN.) =   21.40
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.485
  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        7.02      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.50      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) =    8.52      SUBAREA RUNOFF(CFS) =    7.47
  EFFECTIVE AREA(ACRES) =     39.67    AREA-AVERAGED Fm(INCH/HR) =  0.52
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  AREA-AVERAGED Fp(INCH/HR) =  0.73  AREA-AVERAGED Ap =  0.72
  TOTAL AREA(ACRES) =       39.7        PEAK FLOW RATE(CFS) =      34.35

  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) = 0.51   HALFSTREET FLOOD WIDTH(FEET) =  18.56
  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.

****************************************************************************
  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.) =   21.40
  RAINFALL INTENSITY(INCH/HR) =   1.49
  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 =      34.35

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       49.20   24.03    1.385  0.75( 0.51) 0.69      62.7   21121.00
      2       34.35   21.40    1.485  0.73( 0.52) 0.72      39.7   21150.00

  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       83.18   21.40    1.485  0.74( 0.52) 0.70      95.5   21150.00
      2       79.98   24.03    1.385  0.74( 0.52) 0.70     102.4   21121.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      83.18    Tc(MIN.) =    21.40
  EFFECTIVE AREA(ACRES) =      95.53   AREA-AVERAGED Fm(INCH/HR) =  0.52
  AREA-AVERAGED Fp(INCH/HR) =  0.74  AREA-AVERAGED Ap =  0.70
  TOTAL AREA(ACRES) =      102.4
  LONGEST FLOWPATH FROM NODE  21121.00 TO NODE  21126.00 =    5128.21 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21126.00 TO NODE  21127.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1570.00  DOWNSTREAM ELEVATION(FEET) = 1557.00
  STREET LENGTH(FEET) =   322.81   CURB HEIGHT(INCHES) =  6.0
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```
  STREET HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      84.41
    ***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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "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 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) =      83.18
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       10.17      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B       45.95      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) =   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         Ap     SCS
       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
  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
```

```
 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       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1      132.52   24.73    1.362  0.74( 0.51) 0.68     172.5   21150.00
     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       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     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
     1      242.34   24.73    1.362  0.75( 0.51) 0.68     314.7   21150.00
     2      234.75   27.41    1.280  0.75( 0.51) 0.68     337.0   21121.00
     3      234.06   27.57    1.276  0.75( 0.51) 0.68     337.9   21100.00
   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
```



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 *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         Ap      SCS
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 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) =   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) =     281.16

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44

****************************************************************************
 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      Fp         Ap      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"                  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) =   17.23
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  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 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
  "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
```



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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =       7.62
    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         Ap     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
```

```
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.91
  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      Fp         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) =      17.60

 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) =      20.64
  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         Ap     SCS
      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) =    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      Fp         Ap     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) =   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
```

```
  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) =   15.53
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.38
    HALFSTREET FLOOD WIDTH(FEET) =   12.65
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.52
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.71
  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  16.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.04
  PIPE-FLOW(CFS) =      37.39
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   0.95    Tc(MIN.) =  20.93
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.505
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       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) =      37.39
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 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*
  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<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   20.93
  RAINFALL INTENSITY(INCH/HR) =   1.50
  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 =      37.39

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      280.34   28.03    1.263  0.75( 0.49) 0.66     402.6   21150.00
      1      269.38   30.75    1.195  0.75( 0.49) 0.66     424.9   21121.00
      1      268.52   30.91    1.191  0.75( 0.49) 0.66     425.8   21100.00
      2       37.39   20.93    1.505  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)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      312.59   20.93    1.505  0.75( 0.49) 0.65     337.9   21140.00
      2      309.30   28.03    1.263  0.75( 0.49) 0.66     439.9   21150.00
      3      295.95   30.75    1.195  0.75( 0.49) 0.66     462.2   21121.00
      4      294.97   30.91    1.191  0.75( 0.49) 0.66     463.1   21100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     312.59    Tc(MIN.) =    20.93
  EFFECTIVE AREA(ACRES) =     337.87   AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.65
  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
  CHANNEL FLOW THRU SUBAREA(CFS) =     312.59
  FLOW VELOCITY(FEET/SEC.) =   9.35   FLOW DEPTH(FEET) =   2.55
  TRAVEL TIME(MIN.) =   0.76   Tc(MIN.) =   21.69
  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
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.328
  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        8.73      0.61     1.000    66   17.34
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.90      0.75     0.600    56   10.12
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        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) =     15.28
  TOTAL AREA(ACRES) =      9.81   PEAK FLOW RATE(CFS) =     15.28

  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  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) =      15.28
  FLOW VELOCITY(FEET/SEC.) =   5.32   FLOW DEPTH(FEET) =   0.76
  TRAVEL TIME(MIN.) =   1.93   Tc(MIN.) =   12.04
  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.) =   12.04
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.097
```



```
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       15.02      0.61     1.000    66
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        4.09      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        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) =   26.08
  EFFECTIVE 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) =      39.32

  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  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) =      39.32
  FLOW VELOCITY(FEET/SEC.) =   5.06   FLOW DEPTH(FEET) =   1.25
  TRAVEL TIME(MIN.) =   2.88   Tc(MIN.) =   14.92
  LONGEST 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.) =   14.92
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.844
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  NATURAL FAIR COVER
  "OPEN BRUSH"               B       17.09      0.61     1.000    66
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        4.24      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.47      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) =   21.80      SUBAREA RUNOFF(CFS) =   24.54
  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) =      57.24

  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  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) =      57.24
  FLOW VELOCITY(FEET/SEC.) =   4.71   FLOW DEPTH(FEET) =   1.56
  TRAVEL TIME(MIN.) =   4.23   Tc(MIN.) =   19.15
  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.) =   19.15
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.587
  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        4.30      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"          B       39.32      0.75     0.700    56
  NATURAL FAIR COVER
  "OPEN BRUSH"                B        7.87      0.61     1.000    66
  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) =   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
  TOTAL AREA(ACRES) =      102.4       PEAK FLOW RATE(CFS) =      94.45

  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  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

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
```



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  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =     101.65
    ***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.) =    8.54
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    5.23
  STREET FLOW TRAVEL TIME(MIN.) =   1.55   Tc(MIN.) =   20.70
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.515
  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       10.24      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) =   14.41
  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) =     102.17

  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) = 0.61   HALFSTREET FLOOD WIDTH(FEET) =  23.69
  FLOW VELOCITY(FEET/SEC.) =  8.55   DEPTH*VELOCITY(FT*FT/SEC.) =   5.24
  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  20.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.74
  PIPE-FLOW(CFS) =     102.17
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   1.26    Tc(MIN.) =  21.97
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.462
  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       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) =   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      Fp         Ap      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) =     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         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) =    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
```

```
  MANNING'S FACTOR = 0.035   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      17.67
  FLOW VELOCITY(FEET/SEC.) =   4.88   FLOW DEPTH(FEET) =   0.68
  TRAVEL TIME(MIN.) =   5.17   Tc(MIN.) =   14.34
  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.) =   14.34
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.888
  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       14.70      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) =   19.04
  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) =      31.63

  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  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.) =   14.34
  RAINFALL INTENSITY(INCH/HR) =   1.89
  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 =      31.63

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   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
      2       31.63   14.34    1.888  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       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      140.81   14.34    1.888  0.70( 0.52) 0.74     114.1   21160.00
```



```
      2      136.78   21.97    1.462  0.69( 0.52) 0.75     161.8   21154.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     140.81    Tc(MIN.) =    14.34
  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
  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
  DEPTH OF FLOW IN  54.0 INCH PIPE IS  25.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.77
  PIPE-FLOW(CFS) =     140.81
  *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.

****************************************************************************
  FLOW PROCESS FROM NODE  21164.00 TO NODE  21164.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   14.93
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.843
  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       13.33      0.75     0.600    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        1.74      0.63     1.000    65
  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) =   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
  TOTAL AREA(ACRES) =      176.9       PEAK FLOW RATE(CFS) =     154.78

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44

****************************************************************************
  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  24.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  22.08
  PIPE-FLOW(CFS) =     154.78
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   0.93    Tc(MIN.) =  15.87
  LONGEST FLOWPATH FROM NODE  21154.00 TO NODE  21165.00 =    7499.85 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21165.00 TO NODE  21165.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   15.87
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.777
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  SCHOOL                     B        1.72      0.75     0.600    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       10.42      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) =   12.14      SUBAREA RUNOFF(CFS) =   14.51
  EFFECTIVE AREA(ACRES) =    141.36   AREA-AVERAGED Fm(INCH/HR) =  0.51
  AREA-AVERAGED Fp(INCH/HR) =  0.70  AREA-AVERAGED Ap =  0.72
  TOTAL AREA(ACRES) =      189.1       PEAK FLOW RATE(CFS) =     161.63

  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  21165.00 TO NODE  21165.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 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      160.82   15.96    1.771  0.70( 0.51) 0.72     141.4   21160.00
      2      150.78   23.61    1.400  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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      312.59   21.69    1.473  0.75( 0.49) 0.65     337.9   21140.00
      2      309.30   28.79    1.243  0.75( 0.49) 0.66     439.9   21150.00
      3      295.95   31.52    1.177  0.75( 0.49) 0.66     462.2   21121.00
      4      294.97   31.68    1.174  0.75( 0.49) 0.66     463.1   21100.00
  LONGEST FLOWPATH FROM NODE  21100.00 TO NODE  21165.00 =   11365.46 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```



```
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      460.32   15.96    1.771  0.73( 0.49) 0.68     390.1   21160.00
      2      465.90   21.69    1.473  0.73( 0.50) 0.68     515.0   21140.00
      3      462.49   23.61    1.400  0.73( 0.50) 0.68     554.5   21154.00
      4      433.33   28.79    1.243  0.73( 0.50) 0.68     628.9   21150.00
      5      408.79   31.52    1.177  0.73( 0.50) 0.68     651.2   21121.00
      6      407.22   31.68    1.174  0.73( 0.50) 0.68     652.1   21100.00
    TOTAL AREA(ACRES) =       652.1

  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
  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
----------------------------------------------------------------------------
  >>>>>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= 0.84;3H= 1.38;6H= 1.88;24H= 3.60
  S-GRAPH: VALLEY(DEV.)= 91.4%;VALLEY(UNDEV.)/DESERT=  8.6%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.53; LAG(HR) = 0.42; Fm(INCH/HR) = 0.50; 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) =      652.1
  LONGEST FLOWPATH FROM NODE  21100.00 TO NODE  21165.00 =   11365.46 FEET.
   EQUIVALENT 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
  UNIT-HYDROGRAPH METHOD PEAK FLOW RATE(CFS) =    502.47
  TOTAL PEAK FLOW RATE(CFS) =    502.47 (SOURCE FLOW INCLUDED)
  RATIONAL METHOD PEAK FLOW RATE(CFS) =    465.90
   (UPSTREAM NODE PEAK FLOW RATE(CFS) =    465.90)
  PEAK FLOW RATE(CFS) USED =    502.47

****************************************************************************
  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  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
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       28.30      0.75     0.600    56
  SCHOOL                     B       18.42      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) =   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
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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= 0.31;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.
   EQUIVALENT 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
```

```
 ************************************************************************
             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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             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 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
     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
```



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 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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.219
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.461
  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.)
  SCHOOL                     B        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
  "2 DWELLINGS/ACRE"         B        4.38      0.75     0.700    56    9.80
  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)<<<<<
========================================================================
  UPSTREAM ELEVATION(FEET) = 1707.00  DOWNSTREAM ELEVATION(FEET) = 1695.00
  STREET LENGTH(FEET) =   243.63   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) =   0.74

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.00
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.38
    HALFSTREET FLOOD WIDTH(FEET) =   11.15
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.54
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.73
  STREET FLOW TRAVEL TIME(MIN.) =   0.89   Tc(MIN.) =   10.11
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.328
  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        1.00      0.75     0.600    56
  SCHOOL                     B        1.16      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        0.69      0.75     0.700    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.624
  SUBAREA AREA(ACRES) =    2.85      SUBAREA RUNOFF(CFS) =    4.77
  EFFECTIVE AREA(ACRES) =      8.87    AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.66
  TOTAL AREA(ACRES) =        8.9        PEAK FLOW RATE(CFS) =      14.66

  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) = 0.39   HALFSTREET FLOOD WIDTH(FEET) =  11.73
  FLOW VELOCITY(FEET/SEC.) =  4.68   DEPTH*VELOCITY(FT*FT/SEC.) =   1.84
  LONGEST FLOWPATH FROM NODE  21200.00 TO NODE  21202.00 =     813.59 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21202.00 TO NODE  21203.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 18 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1695.00  DOWNSTREAM ELEVATION(FEET) = 1675.00
  STREET LENGTH(FEET) =   482.35   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) =   0.77

    **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      Fp         Ap     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) =   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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      33.30
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.49
```

```
  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         Ap     SCS
      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        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) =      35.83

 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) =      40.37
   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):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



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 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) =    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         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
 SUBAREA AREA(ACRES) =    5.38      SUBAREA RUNOFF(CFS) =    6.04
 EFFECTIVE AREA(ACRES) =     41.46    AREA-AVERAGED Fm(INCH/HR) =  0.51
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  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.68
  TOTAL AREA(ACRES) =       41.5        PEAK FLOW RATE(CFS) =      46.55

  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) =      49.88
    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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 AREA(ACRES) =    6.52      SUBAREA RUNOFF(CFS) =    6.66
  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) =      48.94

  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) = 0.58   HALFSTREET FLOOD WIDTH(FEET) =  21.17
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  FLOW VELOCITY(FEET/SEC.) =  5.24   DEPTH*VELOCITY(FT*FT/SEC.) =   3.05
  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      Fp         Ap     SCS
       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    56
  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)<<<<<
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==========================================================================
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        0.99      0.75     0.250    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        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 AREA(ACRES) =    3.97      SUBAREA RUNOFF(CFS) =    3.74
  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.
```



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****************************************************************************
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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 =  0.600
  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 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.)
  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<<<<<
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 >>>>>(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) =      21.84
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.45
   HALFSTREET FLOOD WIDTH(FEET) =   16.24
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.96
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.79
 STREET FLOW TRAVEL TIME(MIN.) =   8.21   Tc(MIN.) =   22.13
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.455
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 SCHOOL                     B        3.65      0.75     0.600    56
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        4.28      0.75     0.600    56
 RESIDENTIAL
 "2 DWELLINGS/ACRE"         B       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) =   17.40
 EFFECTIVE AREA(ACRES) =     29.92    AREA-AVERAGED Fm(INCH/HR) =  0.48
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.64
 TOTAL AREA(ACRES) =       29.9        PEAK FLOW RATE(CFS) =      26.29

 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) =  17.49
 FLOW VELOCITY(FEET/SEC.) =  4.14   DEPTH*VELOCITY(FT*FT/SEC.) =   1.97
 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
```



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 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =      31.65
   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      Fp         Ap     SCS
      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    56
 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):
```

```
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS   Tc
     LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 RESIDENTIAL
 "2 DWELLINGS/ACRE"          B        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) =      7.71

 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) =       7.71
 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      Fp         Ap      SCS
      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      Fp         Ap      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    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
```

```
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.369
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.294
 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.)
 PUBLIC PARK                B        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) =      5.59
 TOTAL AREA(ACRES) =      3.60   PEAK FLOW RATE(CFS) =      5.59

 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  21213.20 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) =       8.08
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.36
   HALFSTREET FLOOD WIDTH(FEET) =   11.55
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.78
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.99
 STREET FLOW TRAVEL TIME(MIN.) =   5.66   Tc(MIN.) =   16.03
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.766
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 PUBLIC PARK                B        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) =    4.94
 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) =       8.82
```



```
 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) = 0.37   HALFSTREET FLOOD WIDTH(FEET) =  11.95
 FLOW VELOCITY(FEET/SEC.) =  2.85   DEPTH*VELOCITY(FT*FT/SEC.) =   1.04
 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.) =   16.03
 RAINFALL INTENSITY(INCH/HR) =   1.77
 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 =       8.82

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       21.59   15.88    1.776  0.75( 0.52) 0.69      19.1   21210.00
     2        8.82   16.03    1.766  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      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       30.40   15.88    1.776  0.75( 0.53) 0.70      27.0   21210.00
     2       30.24   16.03    1.766  0.75( 0.53) 0.70      27.1   21213.10

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      30.40    Tc(MIN.) =    15.88
 EFFECTIVE AREA(ACRES) =      27.04   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
 CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  10.000
 MANNING'S FACTOR = 0.045   MAXIMUM DEPTH(FEET) =   1.00
```

```
  CHANNEL FLOW THRU SUBAREA(CFS) =      30.40
  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      Fp         Ap     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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       32.40   17.75    1.661  0.75( 0.52) 0.70      31.7   21210.00
      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
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       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
      2       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
```



```
  EFFECTIVE AREA(ACRES) =     60.24  AREA-AVERAGED Fm(INCH/HR) =  0.51
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.90      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        8.64      0.75     0.700    56
  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:
```

```
  DEPTH(FEET) = 0.62   HALFSTREET FLOOD WIDTH(FEET) =  20.00
  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  21215.00 TO NODE  21215.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 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       66.96   19.37    1.576  0.75( 0.51) 0.68      69.8   21210.00
      2       66.78   19.53    1.569  0.75( 0.51) 0.68      70.1   21213.10
      3       54.73   30.45    1.202  0.75( 0.51) 0.68      87.5   21213.30
  LONGEST FLOWPATH FROM NODE  21213.30 TO NODE  21215.00 =    5452.99 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   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
  LONGEST FLOWPATH FROM NODE  21200.00 TO NODE  21215.00 =    5371.61 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   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
      2      121.53   19.53    1.569  0.75( 0.51) 0.68     127.0   21213.10
      3      119.04   22.51    1.441  0.75( 0.50) 0.67     140.4   21200.00
      4       96.18   30.45    1.202  0.75( 0.50) 0.67     153.0   21213.30
    TOTAL AREA(ACRES) =       153.0

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      121.65  Tc(MIN.) =   19.372
  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
  LONGEST FLOWPATH FROM NODE  21213.30 TO NODE  21215.00 =    5452.99 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21215.00 TO NODE  21215.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  21215.00 TO NODE  21216.00 IS CODE =  48
----------------------------------------------------------------------------
  >>>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1520.00  DOWNSTREAM(FEET) =  1470.00
  FLOW LENGTH(FEET) =  1371.54   MANNING'S N =  0.014
  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
  BOX-FLOW(CFS) =     121.65
  BOX-FLOW TRAVEL TIME(MIN.) =   1.28    Tc(MIN.) =   20.66
```



```
  LONGEST FLOWPATH FROM NODE  21213.30 TO NODE  21216.00 =    6824.53 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21216.00 TO NODE  21216.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   20.66
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.517
  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       23.70      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) =   23.70      SUBAREA RUNOFF(CFS) =   22.78
  EFFECTIVE AREA(ACRES) =    149.88   AREA-AVERAGED Fm(INCH/HR) =  0.50
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.66
  TOTAL AREA(ACRES) =      176.7       PEAK FLOW RATE(CFS) =     137.67

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      138.08   20.59    1.520  0.75( 0.50) 0.66     149.9   21210.00
      2      138.23   20.69    1.516  0.75( 0.50) 0.66     150.7   21213.10
      3      133.46   23.60    1.400  0.75( 0.50) 0.66     164.1   21200.00
      4      108.16   31.56    1.176  0.75( 0.50) 0.66     176.7   21213.30
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     138.23  Tc(MIN.) =   20.69
  AREA-AVERAGED Fm(INCH/HR) =  0.50  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.66  EFFECTIVE AREA(ACRES) =     150.69

****************************************************************************
  FLOW PROCESS FROM NODE  21216.00 TO NODE  21217.00 IS CODE =  48
----------------------------------------------------------------------------
  >>>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1470.00  DOWNSTREAM(FEET) =  1415.00
  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
  BOX-FLOW TRAVEL TIME(MIN.) =   1.21    Tc(MIN.) =   21.89
  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.) =   21.89
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.465
  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       12.77      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) =   12.77      SUBAREA RUNOFF(CFS) =   11.68
EFFECTIVE AREA(ACRES) =    163.46   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) =     143.04

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      143.28   21.73    1.471  0.75( 0.49) 0.66     162.7   21210.00
    2      143.76   21.77    1.470  0.75( 0.49) 0.66     163.5   21213.10
    3      138.69   24.65    1.364  0.75( 0.49) 0.66     176.8   21200.00
    4      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
AREA-AVERAGED Ap =  0.66  EFFECTIVE AREA(ACRES) =     163.46

****************************************************************************
  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  1.09 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  16.51
  BOX-FLOW(CFS) =     143.76
  BOX-FLOW TRAVEL TIME(MIN.) =   1.93    Tc(MIN.) =   23.70
  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.) =   23.70
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.397
  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       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) =   16.83
  EFFECTIVE AREA(ACRES) =    183.19   AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.65
  TOTAL AREA(ACRES) =      209.2       PEAK FLOW RATE(CFS) =     149.86
```



```
  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44

  ** PEAK FLOW RATE TABLE **
   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
      2      150.02   23.56    1.402  0.75( 0.49) 0.65     182.4   21210.00
      3      145.67   26.31    1.312  0.75( 0.49) 0.65     196.6   21200.00
      4      118.55   34.33    1.118  0.75( 0.49) 0.65     209.2   21213.30
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     150.02  Tc(MIN.) =   23.56
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.65  EFFECTIVE AREA(ACRES) =     182.38

****************************************************************************
  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
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.265
  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.)
  PUBLIC PARK                 B        8.02      0.75      0.850    56   12.41
  RESIDENTIAL
  "2 DWELLINGS/ACRE"          B        0.68      0.75      0.700    56   11.25
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        B        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) =     13.29
  TOTAL AREA(ACRES) =      8.98   PEAK FLOW RATE(CFS) =     13.29

  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  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) =      13.29
  FLOW VELOCITY(FEET/SEC.) =   2.80   FLOW DEPTH(FEET) =   0.31
  TRAVEL TIME(MIN.) =   4.35   Tc(MIN.) =   14.94
  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.) =   14.94
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.843
  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        0.88      0.75     0.600    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        9.97      0.63     1.000    65
  PUBLIC PARK                B        3.94      0.75     0.850    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        2.50      0.75     0.700    56
  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
  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) =      29.10

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44

****************************************************************************
  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
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      35.77
    ***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.) =    4.92
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.47
  STREET FLOW TRAVEL TIME(MIN.) =   1.62   Tc(MIN.) =   16.55
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.732
  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       11.55      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) =   11.55      SUBAREA RUNOFF(CFS) =   13.34
  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) =      39.84

  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) = 0.51   HALFSTREET FLOOD WIDTH(FEET) =  18.74
  FLOW VELOCITY(FEET/SEC.) =  5.13   DEPTH*VELOCITY(FT*FT/SEC.) =   2.64
  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) =      47.81
    ***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.) =    4.95
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.78
  STREET FLOW TRAVEL TIME(MIN.) =   2.93   Tc(MIN.) =   19.48
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.571
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
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```
  "3-4 DWELLINGS/ACRE"       B        8.47      0.75     0.600    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        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) =   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) =      52.19
    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        3.82      0.75     0.600    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        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
```



```
  TOTAL AREA(ACRES) =       58.9        PEAK FLOW RATE(CFS) =      52.31

  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) = 0.60   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      Fp         Ap     SCS
       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) =   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
```

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  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 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
  "3-4 DWELLINGS/ACRE"       B        4.58      0.75     0.600    56    9.38
  SCHOOL                     B        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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.65      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) =    4.65      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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        9.55      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) =    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
```

```
  TOTAL AREA(ACRES) =       18.9        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) = 0.54   HALFSTREET FLOOD WIDTH(FEET) =  18.99
  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.

****************************************************************************
  FLOW PROCESS FROM NODE  21233.00 TO NODE  21233.00 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.) =   16.93
  RAINFALL INTENSITY(INCH/HR) =   1.71
  AREA-AVERAGED Fm(INCH/HR) =  0.45
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.60
  EFFECTIVE STREAM AREA(ACRES) =      18.88
  TOTAL STREAM AREA(ACRES) =      18.88
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      21.42

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   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
      2       21.42   16.93    1.709  0.75( 0.45) 0.60      18.9   21230.00

  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       83.67   16.93    1.709  0.72( 0.51) 0.71      77.4   21230.00
      2       81.12   21.94    1.463  0.72( 0.51) 0.71      94.7   21220.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      83.67    Tc(MIN.) =    16.93
  EFFECTIVE AREA(ACRES) =      77.36   AREA-AVERAGED Fm(INCH/HR) =  0.51
  AREA-AVERAGED Fp(INCH/HR) =  0.72  AREA-AVERAGED Ap =  0.71
  TOTAL AREA(ACRES) =       94.7
  LONGEST FLOWPATH FROM NODE  21220.00 TO NODE  21233.00 =    4438.54 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21233.00 TO NODE  21234.00 IS CODE =  48
----------------------------------------------------------------------------
  >>>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1423.00  DOWNSTREAM(FEET) =  1373.00
  FLOW LENGTH(FEET) =  1343.35   MANNING'S N =  0.014
  GIVEN BOX BASEWIDTH(FEET) =   8.00   GIVEN BOX HEIGHT(FEET) =   1.50
```



```
  FLOWDEPTH IN BOX IS  0.71 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  14.64
  BOX-FLOW(CFS) =      83.67
  BOX-FLOW TRAVEL TIME(MIN.) =   1.53    Tc(MIN.) =   18.46
  LONGEST FLOWPATH FROM NODE  21220.00 TO NODE  21234.00 =    5781.89 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21234.00 TO NODE  21234.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   18.46
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.623
  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       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) =   32.26
  EFFECTIVE AREA(ACRES) =    107.89   AREA-AVERAGED Fm(INCH/HR) =  0.49
  AREA-AVERAGED Fp(INCH/HR) =  0.72  AREA-AVERAGED Ap =  0.68
  TOTAL AREA(ACRES) =      125.2       PEAK FLOW RATE(CFS) =     109.91

  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      110.33   18.38    1.627  0.72( 0.49) 0.68     107.9   21230.00
      2      103.01   23.33    1.410  0.72( 0.50) 0.69     125.2   21220.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     110.33  Tc(MIN.) =   18.38
  AREA-AVERAGED Fm(INCH/HR) =  0.49  AREA-AVERAGED Fp(INCH/HR) =  0.72
  AREA-AVERAGED Ap =  0.68  EFFECTIVE AREA(ACRES) =     107.89

****************************************************************************
  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  0.71 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  10.32
  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  21235.00 TO NODE  21235.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   19.72
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.560
```

```
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        8.16      0.75     0.250    56
  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) =   16.38
  EFFECTIVE AREA(ACRES) =    122.35   AREA-AVERAGED Fm(INCH/HR) =  0.47
  AREA-AVERAGED Fp(INCH/HR) =  0.73  AREA-AVERAGED Ap =  0.64
  TOTAL AREA(ACRES) =      139.7       PEAK FLOW RATE(CFS) =     120.15

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      120.51   19.65    1.563  0.73( 0.47) 0.64     122.4   21230.00
      2      112.00   24.58    1.367  0.72( 0.48) 0.66     139.7   21220.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     120.51  Tc(MIN.) =   19.65
  AREA-AVERAGED Fm(INCH/HR) =  0.47  AREA-AVERAGED Fp(INCH/HR) =  0.73
  AREA-AVERAGED Ap =  0.64  EFFECTIVE AREA(ACRES) =     122.35

****************************************************************************
  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  0.71 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =   5.44
  BOX-FLOW(CFS) =     120.51
  BOX-FLOW TRAVEL TIME(MIN.) =   0.70    Tc(MIN.) =   20.36
  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
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      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
      2      150.02   23.56    1.402  0.75( 0.49) 0.65     182.4   21210.00
```



```
      3      145.67   26.31    1.312  0.75( 0.49) 0.65     196.6   21200.00
      4      118.55   34.33    1.118  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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      269.31   20.33    1.532  0.74( 0.48) 0.65     280.8   21230.00
      2      265.99   23.51    1.404  0.74( 0.48) 0.65     316.7   21213.10
      3      264.93   23.56    1.402  0.74( 0.48) 0.65     316.1   21210.00
      4      259.37   25.24    1.345  0.74( 0.48) 0.65     330.7   21220.00
      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
    TOTAL AREA(ACRES) =       348.9

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      269.31  Tc(MIN.) =   20.327
  EFFECTIVE AREA(ACRES) =    280.76  AREA-AVERAGED Fm(INCH/HR) =  0.48
  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.

****************************************************************************
  FLOW PROCESS FROM NODE  21236.00 TO NODE  21236.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  21236.00 TO NODE  21246.00 IS CODE =  48
----------------------------------------------------------------------------
  >>>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT)<<<<<
============================================================================
  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  1.62 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  18.45
  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  21246.00 TO NODE  21246.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  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
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
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  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.390
  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
      2      301.73   25.08    1.350  0.74( 0.45) 0.61     373.5   21210.00
      3      301.86   25.11    1.349  0.74( 0.45) 0.61     374.1   21213.10
      4      295.44   26.69    1.301  0.74( 0.45) 0.62     388.1   21220.00
      5      289.29   27.70    1.272  0.74( 0.46) 0.62     393.6   21200.00
      6      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      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  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
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  SUBAREA RUNOFF(CFS) =     10.97
  TOTAL AREA(ACRES) =      6.78   PEAK FLOW RATE(CFS) =     10.97

  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) =      19.39
    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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       13.82      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) =   13.82      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<<<<<
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```
  >>>>>(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) =      32.22
    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
  COMMERCIAL                 B        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) =   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
```



```
  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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         Ap     SCS
       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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      48.06
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.58
```

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  HALFSTREET FLOOD WIDTH(FEET) =   21.05
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.20
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.01
 STREET FLOW TRAVEL TIME(MIN.) =   4.29   Tc(MIN.) =   28.49
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.251
 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       11.63      0.75     0.600    56
 SCHOOL                     B        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) =   12.24
 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) =      48.39

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.58   HALFSTREET FLOOD WIDTH(FEET) =  21.11
 FLOW VELOCITY(FEET/SEC.) =  5.21   DEPTH*VELOCITY(FT*FT/SEC.) =   3.02
 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)<<<<<
============================================================================
 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

 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) =      51.31
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.63
  HALFSTREET FLOOD WIDTH(FEET) =   23.51
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.49
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.82
 STREET FLOW TRAVEL TIME(MIN.) =   3.49   Tc(MIN.) =   31.98
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.167
 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        2.70      0.75     0.600    56
 MOBILE HOME PARK           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) =    5.85
 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) =      49.19

 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) =  23.10
 FLOW VELOCITY(FEET/SEC.) =  4.45   DEPTH*VELOCITY(FT*FT/SEC.) =   2.76
 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.) =   31.98
 RAINFALL INTENSITY(INCH/HR) =   1.17
 AREA-AVERAGED Fm(INCH/HR) =  0.43
 AREA-AVERAGED Fp(INCH/HR) =  0.75
 AREA-AVERAGED Ap =  0.58
 EFFECTIVE STREAM AREA(ACRES) =      74.32
 TOTAL STREAM AREA(ACRES) =      74.32
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      49.19

 ** CONFLUENCE DATA **
  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
     1      301.73   25.08    1.350  0.74( 0.45) 0.61     373.5   21210.00
     1      301.86   25.11    1.349  0.74( 0.45) 0.61     374.1   21213.10
     1      295.44   26.69    1.301  0.74( 0.45) 0.62     388.1   21220.00
     1      289.29   27.70    1.272  0.74( 0.46) 0.62     393.6   21200.00
     1      232.11   35.76    1.091  0.74( 0.46) 0.62     406.2   21213.30
     2       49.19   31.98    1.167  0.75( 0.43) 0.58      74.3   21240.00

 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      355.41   22.02    1.460  0.74( 0.45) 0.60     389.3   21230.00
     2      349.92   25.08    1.350  0.74( 0.45) 0.61     431.8   21210.00
     3      350.05   25.11    1.349  0.74( 0.45) 0.61     432.5   21213.10
     4      343.96   26.69    1.301  0.74( 0.45) 0.61     450.1   21220.00
     5      337.98   27.70    1.272  0.74( 0.45) 0.61     458.0   21200.00
     6      308.10   31.98    1.167  0.74( 0.45) 0.61     474.6   21240.00
     7      276.25   35.76    1.091  0.74( 0.45) 0.61     480.5   21213.30
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     355.41    Tc(MIN.) =    22.02
  EFFECTIVE AREA(ACRES) =     389.28   AREA-AVERAGED Fm(INCH/HR) =  0.45
  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  21246.00 TO NODE  21247.00 IS CODE =  48
----------------------------------------------------------------------------
  >>>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1311.00  DOWNSTREAM(FEET) =  1290.00
  FLOW LENGTH(FEET) =  1258.84   MANNING'S N =  0.014
  GIVEN BOX BASEWIDTH(FEET) =  12.00   GIVEN BOX HEIGHT(FEET) =   4.00
  FLOWDEPTH IN BOX IS  1.76 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  16.83
  BOX-FLOW(CFS) =     355.41
  BOX-FLOW TRAVEL TIME(MIN.) =   1.25    Tc(MIN.) =   23.26
  LONGEST FLOWPATH FROM NODE  21213.30 TO NODE  21247.00 =   13319.44 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21247.00 TO NODE  21247.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   23.26
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.412
  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       23.54      0.75     0.600    56
  COMMERCIAL                 B        1.26      0.75     0.100    56
  MOBILE HOME PARK           B        0.22      0.75     0.250    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        1.80      0.63     1.000    65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.73
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.600
  SUBAREA AREA(ACRES) =   26.82      SUBAREA RUNOFF(CFS) =   23.44
  EFFECTIVE AREA(ACRES) =    416.10   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) =     362.23

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.32; 6HR = 1.81; 24HR = 3.44

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     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
      5      346.64   28.68    1.246  0.74( 0.45) 0.61     484.8   21200.00
      6      313.63   32.94    1.146  0.74( 0.45) 0.61     501.4   21240.00
      7      284.21   36.70    1.074  0.74( 0.45) 0.61     507.4   21213.30
```



```
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     363.11  Tc(MIN.) =   23.20
  AREA-AVERAGED Fm(INCH/HR) =  0.45  AREA-AVERAGED Fp(INCH/HR) =  0.74
  AREA-AVERAGED Ap =  0.60  EFFECTIVE AREA(ACRES) =     416.10

****************************************************************************
  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) =      554.63    Tc(MIN.) =   33.08
  AREA-AVERAGED Fm(INCH/HR) =  0.49    Ybar = 0.61
  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) =      554.63    Tc(MIN.) =   33.08
  AREA-AVERAGED Fm(INCH/HR) =  0.49    Ybar = 0.61
  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 <<<<<
============================================================================

****************************************************************************
  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  44.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  25.65
  PIPE-FLOW(CFS) =     554.63
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   0.88    Tc(MIN.) =  33.97
  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.) =   33.97
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.126
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        0.01      0.75     0.250    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        7.68      0.75     0.600    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        2.53      0.63     1.000    65
  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= 1.00
  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=.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)     Ap     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
```



```
      5      346.64   28.68    1.246  0.74( 0.45) 0.61     484.8   21200.00
      6      313.63   32.94    1.146  0.74( 0.45) 0.61     501.4   21240.00
      7      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= 1.00
  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=.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.) =   34.30
  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.) =   34.30
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.119
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B       37.17      0.75     0.250    56
  COMMERCIAL                 B       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= 0.31;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
```

```
************************************************************************
            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 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*
     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)]**0.20
  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   10.98
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        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) =      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  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
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 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  10.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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) =      10.13
   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      Fp         Ap     SCS
      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
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 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      Fp         Ap     SCS
      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    56
 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
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    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.15
  STREET FLOW TRAVEL TIME(MIN.) =   0.49   Tc(MIN.) =   12.84
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.018
  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        1.38      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 =  0.675
  SUBAREA AREA(ACRES) =    1.83      SUBAREA RUNOFF(CFS) =    2.49
  EFFECTIVE AREA(ACRES) =     11.65    AREA-AVERAGED Fm(INCH/HR) =  0.51
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.68
  TOTAL AREA(ACRES) =       11.6        PEAK FLOW RATE(CFS) =      15.83

  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) = 0.33   HALFSTREET FLOOD WIDTH(FEET) =  10.38
  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.

****************************************************************************
  FLOW PROCESS FROM NODE  21304.00 TO NODE  21305.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1600.00  DOWNSTREAM ELEVATION(FEET) = 1580.00
  STREET LENGTH(FEET) =   267.45   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      18.67
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.37
    HALFSTREET FLOOD WIDTH(FEET) =   12.26
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.76
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.14
  STREET FLOW TRAVEL TIME(MIN.) =   0.77   Tc(MIN.) =   13.61
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.948
  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        0.80      0.75     0.600    56
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  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        3.59      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) =    4.39      SUBAREA RUNOFF(CFS) =    5.68
  EFFECTIVE AREA(ACRES) =     16.04    AREA-AVERAGED Fm(INCH/HR) =  0.51
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.68
  TOTAL AREA(ACRES) =       16.0        PEAK FLOW RATE(CFS) =      20.78

  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) = 0.38   HALFSTREET FLOOD WIDTH(FEET) =  12.80
  FLOW VELOCITY(FEET/SEC.) =  5.91   DEPTH*VELOCITY(FT*FT/SEC.) =   2.26
  LONGEST FLOWPATH FROM NODE  21300.00 TO NODE  21305.00 =    1528.16 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21305.00 TO NODE  21306.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
============================================================================
  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

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      27.56
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.43
    HALFSTREET FLOOD WIDTH(FEET) =   15.23
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.66
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.44
  STREET FLOW TRAVEL TIME(MIN.) =   1.29   Tc(MIN.) =   14.91
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.845
  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        8.99      0.75     0.700    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.29      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.680
  SUBAREA AREA(ACRES) =   11.28      SUBAREA RUNOFF(CFS) =   13.57
  EFFECTIVE AREA(ACRES) =     27.32    AREA-AVERAGED Fm(INCH/HR) =  0.51
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.68
  TOTAL AREA(ACRES) =       27.3        PEAK FLOW RATE(CFS) =      32.85
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  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      Fp         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) =   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.
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****************************************************************************
  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      Fp         Ap     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    56
  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)<<
============================================================================
```

```
  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      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) =   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) =     103.37

  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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       18.20      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) =   18.20      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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       19.39      0.75     0.600    56
  SCHOOL                     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

****************************************************************************
```

```
 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  24.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  21.21
 PIPE-FLOW(CFS) =     141.92
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME(MIN.) =   1.10    Tc(MIN.) =  22.18
 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.) =   22.18
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.453
 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       77.43      0.75     0.600    56
 SCHOOL                     B        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) =   74.94
 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) =     210.69

 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  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  28.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  23.37
 PIPE-FLOW(CFS) =     210.69
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME(MIN.) =   0.54    Tc(MIN.) =  22.72
 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.) =   22.72
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.433
 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       10.40      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) =   10.40      SUBAREA RUNOFF(CFS) =    9.21
 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

 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  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  1.85 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  19.40
 BOX-FLOW(CFS) =     215.46
 BOX-FLOW TRAVEL TIME(MIN.) =   0.93    Tc(MIN.) =   23.65
 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.) =   23.65
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.399
 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        4.55      0.75     0.600    56
 MOBILE HOME PARK           B        1.01      0.75     0.250    56
 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) =    4.99
 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) =     215.46
 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 =  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 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
  "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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
```



```
  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) =   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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        9.34      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) =    9.34      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
```

```
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   18.47
  RAINFALL INTENSITY(INCH/HR) =   1.62
  AREA-AVERAGED Fm(INCH/HR) =  0.45
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.60
  EFFECTIVE STREAM AREA(ACRES) =      25.49
  TOTAL STREAM AREA(ACRES) =      25.49
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      26.92

****************************************************************************
  FLOW PROCESS FROM NODE  21330.00 TO NODE  21331.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   870.87
  ELEVATION DATA: UPSTREAM(FEET) =   1440.00  DOWNSTREAM(FEET) =   1425.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.920
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.922
  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
  "3-4 DWELLINGS/ACRE"       B        9.67      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) =     12.82
  TOTAL AREA(ACRES) =      9.67   PEAK FLOW RATE(CFS) =     12.82

  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  21331.00 TO NODE  21332.00 IS CODE =  33
----------------------------------------------------------------------------
  >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1425.00
  DOWNSTREAM NODE ELEVATION(FEET) =  1355.00
  FLOW LENGTH(FEET) =  1286.35   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   7.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.30
  PIPE-FLOW(CFS) =      12.82
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   1.71    Tc(MIN.) =  15.63
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.793
  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       22.89      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
```



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  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.600
  SUBAREA AREA(ACRES) =   22.89      SUBAREA RUNOFF(CFS) =   27.70
  EFFECTIVE AREA(ACRES) =     32.56    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) =      39.40

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20

  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) =   0.66
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  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) =   26.58
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.43
    HALFSTREET FLOOD WIDTH(FEET) =   15.15
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.51
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.36
  LONGEST FLOWPATH FROM NODE  21330.00 TO NODE  21332.00 =    2157.22 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21332.00 TO NODE  21332.00 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.) =   15.63
  RAINFALL INTENSITY(INCH/HR) =   1.79
  AREA-AVERAGED Fm(INCH/HR) =  0.45
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.60
  EFFECTIVE STREAM AREA(ACRES) =      32.56
  TOTAL STREAM AREA(ACRES) =      32.56
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      39.40

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       26.92   18.47    1.622  0.75( 0.45) 0.60      25.5   21320.00
      2       39.40   15.63    1.793  0.75( 0.45) 0.60      32.6   21330.00

  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       65.49   15.63    1.793  0.75( 0.45) 0.60      54.1   21330.00
```

```
     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      Fp         Ap     SCS
       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) =   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
  TOTAL AREA(ACRES) =       72.8       PEAK FLOW RATE(CFS) =      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
----------------------------------------------------------------------------
```



```
  >>>>>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
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.813
  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
  "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) =      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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       10.28      0.75     0.600    56
  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) =   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

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      68.07
  ***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         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
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) =   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      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
RESIDENTIAL
"3-4 DWELLINGS/ACRE"       B       23.13      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) =   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
```

```
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.63
  RAINFALL INTENSITY(INCH/HR) =   1.95
  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 =     117.34

****************************************************************************
  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
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.241
  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        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) =      7.56
  TOTAL AREA(ACRES) =      4.87   PEAK FLOW RATE(CFS) =      7.56

  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  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) =       7.56
  FLOW VELOCITY(FEET/SEC.) =   2.81   FLOW DEPTH(FEET) =   0.23
  TRAVEL TIME(MIN.) =   1.40   Tc(MIN.) =   12.18
  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.) =   12.18
```



```
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.083
  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        1.96      0.75     0.700    56
  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 AREA(ACRES) =     2.18      SUBAREA RUNOFF(CFS) =     3.07
  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) =       9.94

  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  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   5.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.64
  PIPE-FLOW(CFS) =       9.94
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =  12.41
  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.) =   12.41
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.059
  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        0.89      0.75     0.600    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        6.98      0.75     0.700    56
  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
  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) =      20.72

  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  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   9.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.91
  PIPE-FLOW(CFS) =      20.72
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   0.36    Tc(MIN.) =  12.77
  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.) =   12.77
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.024
  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
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        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) =   12.60
  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) =      32.85

  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  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  11.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.49
  PIPE-FLOW(CFS) =      32.85
```



```
  *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  21354.00 TO NODE  21354.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   15.12
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.829
  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       33.72      0.75     0.600    56
  COMMERCIAL                 B        0.32      0.75     0.100    56
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        1.48      0.75     0.700    56
  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) =   44.14
  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) =      72.75

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.20

****************************************************************************
  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.) =   15.12
  RAINFALL INTENSITY(INCH/HR) =   1.83
  AREA-AVERAGED Fm(INCH/HR) =  0.48
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.64
  EFFECTIVE STREAM AREA(ACRES) =      59.69
  TOTAL STREAM AREA(ACRES) =      59.69
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      72.75

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      117.34   13.63    1.946  0.75( 0.48) 0.65      89.2   21340.00
      2       72.75   15.12    1.829  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)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```

```
     1      188.62   13.63    1.946  0.75( 0.48) 0.64     143.0   21340.00
     2      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      Fp         Ap     SCS
       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 **
```



```
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   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 **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       80.35   16.36    1.745  0.75( 0.45) 0.60      68.9   21330.00
      2       74.41   19.21    1.584  0.75( 0.45) 0.60      72.8   21320.00
  LONGEST FLOWPATH FROM NODE  21320.00 TO NODE  21355.00 =    3805.88 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      267.11   14.56    1.871  0.75( 0.47) 0.63     211.2   21340.00
      2      260.76   16.06    1.764  0.75( 0.47) 0.63     223.4   21350.00
      3      258.32   16.36    1.745  0.75( 0.47) 0.63     224.6   21330.00
      4      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.) =   14.563
  EFFECTIVE AREA(ACRES) =    211.23  AREA-AVERAGED Fm(INCH/HR) =  0.47
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.63
  TOTAL 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 =  0.013

  USER 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.) =  17.57
  PIPE-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<<<<<
============================================================================
```

```
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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) =    5.44
  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) =     294.60
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        7.40      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) =    7.40      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):
```

```
 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

 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
----------------------------------------------------------------------------
 >>>>>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
 "3-4 DWELLINGS/ACRE"       B        3.67      0.75      0.600    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
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      293.92   18.77    1.607  0.75( 0.46) 0.62     273.1   21340.00
     2      286.27   20.29    1.533  0.75( 0.46) 0.62     285.2   21350.00
     3      283.62   20.60    1.519  0.75( 0.46) 0.62     286.5   21330.00
     4      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 **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  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 **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      502.80   18.77    1.607  0.75( 0.46) 0.62     473.0   21340.00
     2      497.64   20.29    1.533  0.75( 0.46) 0.62     501.4   21350.00
     3      495.44   20.60    1.519  0.75( 0.46) 0.62     505.9   21330.00
     4      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
```

```
 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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B       11.84      0.75     0.600    56
 MOBILE HOME PARK           B        3.43      0.75     0.250    56
 COMMERCIAL                 B        1.54      0.75     0.100    56
 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) =     502.80
 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 = 3.20

****************************************************************************
 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.

****************************************************************************
```



```
 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) =     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      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B       42.57      0.75     0.600    56
 MOBILE HOME PARK           B       41.35      0.75     0.250    56
 COMMERCIAL                 B       17.40      0.75     0.100    56
 AGRICULTURAL FAIR COVER
 "ORCHARDS"                 B        0.33      0.63     1.000    65
 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.
  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) =     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  21361.00 TO NODE  21361.00 IS CODE =  11
--------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
==========================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  PEAK FLOW RATE(CFS) =     1001.24    Tc(MIN.) =   35.34
  AREA-AVERAGED Fm(INCH/HR) =  0.45    Ybar = 0.57
  TOTAL AREA(ACRES) =     1442.0
  LONGEST FLOWPATH FROM NODE  21100.00 TO NODE  21361.00 =   17083.18 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      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 FROM NODE  21300.00 TO NODE  21361.00 =   11092.76 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.
```



```
**************************************************************************
  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      Fp         Ap      SCS
        LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        B        4.75      0.75      0.600    56
  COMMERCIAL                  B       11.57      0.75      0.100    56
  MOBILE HOME PARK            B       12.66      0.75      0.250    56
  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
```

```
  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      Fp         Ap      SCS   Tc
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        3.63      0.75      0.600    56   10.33
  COMMERCIAL                 B        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) =     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) =      21.33
    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):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        5.99      0.75      0.600    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 =  0.599
  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) =      22.94
```



```
  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) = 0.49   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      Fp         Ap      SCS
       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) =    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 Tc :
  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.
```

```
****************************************************************************
  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  10.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.72
  PIPE-FLOW(CFS) =      29.86
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   0.33    Tc(MIN.) =  11.68
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.135
  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        4.94      0.75     0.600    56
  COMMERCIAL                 B        0.17      0.75     0.100    56
  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) =    7.81
  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) =      37.07

  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) =   0.64
  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) =    7.21
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.30
    HALFSTREET FLOOD WIDTH(FEET) =    8.51
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.28
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.27
  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  12.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.11
  PIPE-FLOW(CFS) =      37.07
  *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.

****************************************************************************
  FLOW PROCESS FROM NODE  21375.00 TO NODE  21375.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   12.00
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.102
  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       10.88      0.75     0.600    56
  COMMERCIAL                 B       14.84      0.75     0.100    56
  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) =   43.26
  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) =      79.61

  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  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  20.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  17.42
  PIPE-FLOW(CFS) =      79.61
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  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  21376.00 TO NODE  21376.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
```

```
==========================================================================
  MAINLINE Tc(MIN.) =   13.83
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.930
  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       33.59      0.75     0.600    56
  MOBILE HOME PARK           B        3.65      0.75     0.250    56
  COMMERCIAL                 B        1.26      0.75     0.100    56
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B       12.70      0.75     0.250    56
  RESIDENTIAL
  "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) =   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     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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) =   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
  TOTAL AREA(ACRES) =      123.5       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
```

```
  TOTAL STREAM AREA(ACRES) =     123.46
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     163.58
  ** CONFLUENCE DATA **
  STREAM      Q        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= 1.00
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =     2153.6
  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) =     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.) =     36.49
  AREA-AVERAGED Fm(INCH/HR)=  0.44   Ybar =  0.56
  PEAK FLOW RATE(CFS)   =   1389.13
============================================================================
============================================================================
  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                      *
* 10-YR  HC ULTIMATE CONDITION    OCT 2013   DMALOTT                     *
 ************************************************************************

  FILE NAME: LR0214ZZ.DAT
  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

  *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  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)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.742
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  4.271
  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
  "3-4 DWELLINGS/ACRE"       B        8.19      0.75      0.600    56   10.49
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        0.62      0.75      0.700    56   11.15
  COMMERCIAL                 B        0.44      0.75      0.100    56    7.74
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.583
  SUBAREA RUNOFF(CFS) =     31.92
  TOTAL AREA(ACRES) =      9.25   PEAK FLOW RATE(CFS) =     31.92

  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  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
```

```
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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) =      38.31

  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) =      38.31
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        3.90      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) =    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      Fp         Ap     SCS
       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
```

```
  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
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       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) =    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       26.61      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) =   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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        1.06      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        5.55      0.75     0.600    56
  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
----------------------------------------------------------------------------
```

```
  >>>>>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 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
  "3-4 DWELLINGS/ACRE"       B        3.87      0.75     0.600    56   11.68
  RESIDENTIAL
  "2 DWELLINGS/ACRE"         B        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      Fp         Ap     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 AREA(ACRES) =    7.50      SUBAREA RUNOFF(CFS) =   15.57
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.80      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) =    1.80      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
```

```
----------------------------------------------------------------------------
  >>>>>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) =      27.63
  FLOW VELOCITY(FEET/SEC.) =   2.52   FLOW DEPTH(FEET) =   0.47
  TRAVEL TIME(MIN.) =   2.15   Tc(MIN.) =   19.90
  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.) =   19.90
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.424
  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        5.90      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) =   10.49
  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) =      35.90

  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  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  12.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.71
  PIPE-FLOW(CFS) =      35.90
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   0.28    Tc(MIN.) =  20.18
  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.) =   20.18
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.404
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        0.54      0.75     0.250    56
  PUBLIC PARK                B        1.31      0.75     0.850    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.69      0.75     0.600    56
  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) =    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
  TOTAL AREA(ACRES) =       22.8       PEAK FLOW RATE(CFS) =      39.91

  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  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  15.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.37
  PIPE-FLOW(CFS) =      39.91
  *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  21416.00 TO NODE  21416.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   20.77
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.362
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  MOBILE HOME PARK           B        2.38      0.75     0.250    56
  PUBLIC PARK                B        2.15      0.75     0.850    56
  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) =    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
  TOTAL AREA(ACRES) =       27.3       PEAK FLOW RATE(CFS) =      47.06

  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  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

  USER SPECIFIED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  15.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.67
  PIPE-FLOW(CFS) =      47.06
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   0.44    Tc(MIN.) =  21.21
  LONGEST FLOWPATH FROM NODE  21410.00 TO NODE  21417.00 =    3166.72 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21417.00 TO NODE  21417.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   21.21
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.333
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        0.24      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.73      0.75     0.600    56
  MOBILE HOME PARK           B        0.34      0.75     0.250    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.418
  SUBAREA AREA(ACRES) =    1.31      SUBAREA RUNOFF(CFS) =    2.38
  EFFECTIVE AREA(ACRES) =     28.62   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) =      48.71

  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
----------------------------------------------------------------------------
  >>>>>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.) =   21.21
  RAINFALL INTENSITY(INCH/HR) =   2.33
  AREA-AVERAGED Fm(INCH/HR) =  0.44
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.59
  EFFECTIVE STREAM AREA(ACRES) =      28.62
  TOTAL STREAM AREA(ACRES) =      28.62
```



```
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      48.71

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      159.22   15.89    2.774  0.75( 0.40) 0.53      74.4   21400.00
      2       48.71   21.21    2.333  0.75( 0.44) 0.59      28.6   21410.00

  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      204.23   15.89    2.774  0.75( 0.41) 0.54      95.9   21400.00
      2      178.37   21.21    2.333  0.75( 0.41) 0.55     103.1   21410.00

  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
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.54
  TOTAL AREA(ACRES) =      103.1
  LONGEST FLOWPATH FROM NODE  21400.00 TO NODE  21417.00 =    3607.36 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21417.00 TO NODE  21418.00 IS CODE =  42
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1250.00
  DOWNSTREAM NODE ELEVATION(FEET) =  1218.00
  FLOW LENGTH(FEET) =  2374.87   MANNING'S N =  0.013

  USER SPECIFIED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
  USER SPECIFIED PIPE SYSTEM UNDER PRESSURE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.73
  PIPE-FLOW(CFS) =     180.72
  PIPEFLOW TRAVEL TIME(MIN.) =   3.11    Tc(MIN.) =  19.00

  *DEFICIENCY ANALYSIS(BASED ON REPLACEMENT SYSTEM HYDROLOGY):
  *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
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.08
  PIPE-FLOW(CFS) =     204.23
  PIPEFLOW TRAVEL TIME(MIN.) =   2.63    Tc(MIN.) =  18.52

  *PARALLEL PIPE SYSTEM (MANNING'S N = .0130):
  PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  LONGEST FLOWPATH FROM NODE  21400.00 TO NODE  21418.00 =    5982.23 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21418.00 TO NODE  21418.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   18.52
```

```
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.531
  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        3.88      0.75     0.600    56
  COMMERCIAL                 B        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
  TOTAL AREA(ACRES) =      145.8       PEAK FLOW RATE(CFS) =     273.49

  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<<<<<
```



```
  >>>>>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) =    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        7.20      0.75     0.600    56
  COMMERCIAL                 B       26.95      0.75     0.100    56
  MOBILE HOME PARK           B       13.18      0.75     0.250    56
  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.
   EQUIVALENT 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.
```

```
 ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      273.49   18.52    2.531  0.75( 0.34) 0.45     138.6   21400.00
     2      239.56   23.94    2.169  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:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.81;3H= 1.32;6H= 1.80;24H= 3.38
 S-GRAPH: VALLEY(DEV.)= 96.6%;VALLEY(UNDEV.)/DESERT=  3.4%
          MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
 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.
 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) =     2346.8
 LONGEST FLOWPATH FROM NODE  21100.00 TO NODE  21418.00 =   19307.12 FEET.
  EQUIVALENT 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) =     321.10
 PEAK FLOW RATE(CFS) =    1506.08

****************************************************************************
 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) =    1506.08
 FLOW VELOCITY(FEET/SEC.) =  18.30   FLOW DEPTH(FEET) =   3.94
 TRAVEL TIME(MIN.) =   1.80   Tc(MIN.) =   39.28
 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.) =   39.28
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.612
 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       13.22      0.75     0.600    56
 COMMERCIAL                 B       80.88      0.75     0.100    56
```



```
 MOBILE HOME PARK           B       29.32      0.75     0.250    56
 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= 0.30;30M= 0.62;1H= 0.81;3H= 1.32;6H= 1.80;24H= 3.36
 S-GRAPH: VALLEY(DEV.)= 96.8%;VALLEY(UNDEV.)/DESERT=  3.2%
          MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
 Tc(HR) = 0.65; LAG(HR) = 0.52; Fm(INCH/HR) = 0.42; Ybar = 0.53
 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=.0316; Lca/L=0.4,n=.0283; Lca/L=0.5,n=.0260;Lca/L=0.6,n=.0243
 TIME OF PEAK FLOW(HR) = 16.58  RUNOFF VOLUME(AF) =     346.42
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    1564.88
 TOTAL AREA(ACRES) =     2470.2       PEAK FLOW RATE(CFS) =    1564.88

 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  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) =   20.17
 ASSUME FULL-FLOWING BOX   BOX-FLOW VELOCITY(FEET/SEC.) =  15.52
 BOX-FLOW(CFS) =    1564.88
 BOX-FLOW TRAVEL TIME(MIN.) =   3.24    Tc(MIN.) =   42.52
 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.) =   42.52
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.537
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B       73.53      0.75     0.100    56
 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                B       28.10      0.75     0.850    56
 RESIDENTIAL
 "8-10 DWELLINGS/ACRE"      B       24.44      0.75     0.400    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 =  0.365
  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      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK                B        0.85      0.75     0.850    56
  COMMERCIAL                 B        0.87      0.75     0.100    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 =  0.482
  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
```

```
  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       51.49      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        5.09      0.75     0.600    56
  PUBLIC PARK                B        3.37      0.75     0.850    56
  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.
   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) =    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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       65.40      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        1.90      0.75     0.600    56
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        4.85      0.75     0.200    56
  PUBLIC PARK                B        2.00      0.75     0.850    56
  RESIDENTIAL
```

```
"8-10 DWELLINGS/ACRE"      B       47.14      0.75     0.400    56
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= 0.30;30M= 0.62;1H= 0.81;3H= 1.40;6H= 1.98;24H= 3.97
S-GRAPH: VALLEY(DEV.)= 77.0%;VALLEY(UNDEV.)/DESERT= 23.0%
         MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
Tc(HR) = 1.07; LAG(HR) = 0.85; Fm(INCH/HR) = 0.47; Ybar = 0.57
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.
 EQUIVALENT 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=.0214
TIME OF PEAK FLOW(HR) = 16.92  RUNOFF VOLUME(AF) =    2022.63
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    4216.10
TOTAL AREA(ACRES) =    13911.6       PEAK FLOW RATE(CFS) =    4216.10

SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
5M = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12

****************************************************************************
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) =    4216.10
FLOW VELOCITY(FEET/SEC.) =  21.92   FLOW DEPTH(FEET) =   6.01
TRAVEL TIME(MIN.) =   0.51   Tc(MIN.) =   64.60
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.) =   64.60
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.196
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        1.99      0.75     0.600    56
COMMERCIAL                 B       11.78      0.75     0.100    56
MOBILE HOME PARK           B        4.78      0.75     0.250    56
PUBLIC PARK                B        1.74      0.75     0.850    56
RESIDENTIAL
"11+ DWELLINGS/ACRE"       B        0.99      0.75     0.200    56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.246
SUBAREA AREA(ACRES) =   21.28
```



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UNIT-HYDROGRAPH DATA:
RAINFALL(INCH): 5M= 0.30;30M= 0.62;1H= 0.81;3H= 1.40;6H= 1.98;24H= 3.97
S-GRAPH: VALLEY(DEV.)= 77.1%;VALLEY(UNDEV.)/DESERT= 22.9%
         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
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.
 EQUIVALENT BASIN FACTOR APPROXIMATIONS:
 Lca/L=0.3,n=.0277; Lca/L=0.4,n=.0248; Lca/L=0.5,n=.0228;Lca/L=0.6,n=.0213
TIME OF PEAK FLOW(HR) = 16.92  RUNOFF VOLUME(AF) =    2026.74
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    4223.43
TOTAL AREA(ACRES) =    13932.8       PEAK FLOW RATE(CFS) =    4223.43

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  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) =    4223.43
FLOW VELOCITY(FEET/SEC.) =  21.57   FLOW DEPTH(FEET) =   6.09
TRAVEL TIME(MIN.) =   0.54   Tc(MIN.) =   65.14
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.) =   65.14
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.190
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        0.52      0.75     0.600    56
PUBLIC PARK                B        1.21      0.75     0.850    56
MOBILE HOME PARK           B        4.21      0.75     0.250    56
SCHOOL                     B        0.18      0.75     0.600    56
COMMERCIAL                 B        0.96      0.75     0.100    56
RESIDENTIAL
"11+ DWELLINGS/ACRE"       B        0.39      0.75     0.200    56
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= 0.30;30M= 0.62;1H= 0.81;3H= 1.40;6H= 1.98;24H= 3.97
S-GRAPH: VALLEY(DEV.)= 77.1%;VALLEY(UNDEV.)/DESERT= 22.9%
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```
          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 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
  "5-7 DWELLINGS/ACRE"       B        0.20      0.75     0.500    56    6.53
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.38      0.75     0.600    56    6.92
  COMMERCIAL                 B        3.33      0.75     0.100    56    5.10
  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
```



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----------------------------------------------------------------------------
  >>>>>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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  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    56
  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
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  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
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  4.394
  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) =   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
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  Manning's FRICTION FACTOR for Streetflow 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) =      91.18
    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):
   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
  COMMERCIAL                 B        8.62      0.75     0.100    56
  RESIDENTIAL
  "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) =   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) =     129.13
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.89
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  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         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
"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) =   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
```



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 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
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        2.44      0.75     0.600    56
 COMMERCIAL                 B       28.76      0.75     0.100    56
 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) =   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
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B       22.52      0.75     0.100    56
 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) =   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
```

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  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        0.28      0.63     1.000    65
  COMMERCIAL                 B       35.84      0.75     0.100    56
  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:
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  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) =   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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        0.33      0.63     1.000    65
  COMMERCIAL                 B       21.36      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        3.94      0.75     0.600    56
  MOBILE HOME PARK           B        2.98      0.75     0.250    56
  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) =     404.16

  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) =  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      Q        Tc      AREA      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)<<<<<
============================================================================
```



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  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) =    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      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  MOBILE HOME PARK           B        6.41      0.75      0.250    56   12.59
  PUBLIC PARK                B        0.38      0.75      0.850    56   18.09
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.07      0.75      0.600    56   15.43
  SCHOOL                     B        0.09      0.75      0.600    56   15.43
  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
```

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  STREET HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      39.29
    ***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
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.627
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  PUBLIC PARK                B        1.22      0.75     0.850    56
  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) =   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 = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.80   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,
         AND L =  701.1 FT WITH ELEVATION-DROP =   2.0 FT, IS   44.0 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  26.6 INCHES
```



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  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      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1      4279.97   66.39    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= 0.30;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) = 1.11; LAG(HR) = 0.89; 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) =    14142.0
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21443.00 =   53509.95 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   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
  PEAK FLOW RATE(CFS) =    4248.21
    (UPSTREAM NODE PEAK FLOW RATE(CFS) =    4279.97)
  PEAK FLOW RATE(CFS) USED =    4279.97

****************************************************************************
  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) =    4279.97
  FLOW VELOCITY(FEET/SEC.) =  25.16   FLOW DEPTH(FEET) =   5.49
```

```
  TRAVEL TIME(MIN.) =   1.04   Tc(MIN.) =   67.43
  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) =    4279.97    Tc(MIN.) =   67.43
  AREA-AVERAGED Fm(INCH/HR) =  0.47   Ybar = 0.56
  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
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.473
  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.)
  MOBILE HOME PARK           B        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 = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12

****************************************************************************
  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
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.909
  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        0.02      0.75     0.900    56
  MOBILE HOME PARK           B       18.33      0.75     0.250    56
  PUBLIC PARK                B        0.30      0.75     0.850    56
```



```
  RESIDENTIAL
  "11+ DWELLINGS/ACRE"       B        0.28      0.75     0.200    56
  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 = 0.30; 30M = 0.61; 1HR = 0.80; 3HR = 1.29; 6HR = 1.74; 24HR = 3.12

  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
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.848
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       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) =      53.78
  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
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  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  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      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1      4279.97   67.43    14141.99    20120.00
     2        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      Fp         Ap      SCS   Tc
       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"       B        5.98      0.75     0.500    56   14.89
  COMMERCIAL                 B        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) =     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
```

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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) =      34.54
    ***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.) =    2.86
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.76
  STREET FLOW TRAVEL TIME(MIN.) =   2.79   Tc(MIN.) =   14.42
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.940
  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        6.46      0.75     0.500    56
  COMMERCIAL                 B        0.09      0.75     0.100    56
  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
  EFFECTIVE AREA(ACRES) =     16.54    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) =      38.47

  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) = 0.64   HALFSTREET FLOOD WIDTH(FEET) =  24.79
  FLOW VELOCITY(FEET/SEC.) =  2.95   DEPTH*VELOCITY(FT*FT/SEC.) =   1.88
  *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
  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) =      38.47
  FLOW VELOCITY(FEET/SEC.) =   9.78   FLOW DEPTH(FEET) =   0.99
  TRAVEL TIME(MIN.) =   0.46   Tc(MIN.) =   14.88
  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.) =   14.88
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.886
  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        0.34      0.75     0.600    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        8.08      0.75     0.500    56
  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) =     24.96   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) =      56.67

  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  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) =      56.67
  FLOW VELOCITY(FEET/SEC.) =  10.12   FLOW DEPTH(FEET) =   1.25
  TRAVEL TIME(MIN.) =   0.63   Tc(MIN.) =   15.51
  LONGEST 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<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   15.51
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.815
  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    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) =     31.72   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) =      69.92
```

```
  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  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      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B        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) =     39.40   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 SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   17.40
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.627
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B        0.26      0.75     0.100    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"        B        8.00      0.75     0.500    56
  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) =   17.03
  EFFECTIVE AREA(ACRES) =     47.77   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) =      97.20

  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  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) =      97.20
  FLOW VELOCITY(FEET/SEC.) =  11.27   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 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21467.00 TO NODE  21467.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   19.14
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.481
  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        7.62      0.75     0.500    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                  B        1.76      0.63     1.000    65
  COMMERCIAL                  B        2.13      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        B        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) =     59.43   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) =     113.17

  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      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        0.73      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.64      0.75     0.600    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B       11.78      0.75     0.500    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        2.68      0.63     1.000    65
  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) =     131.58
  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         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        8.14      0.75     0.100    56
  AGRICULTURAL FAIR COVER
  "ORCHARDS"                 B        7.28      0.63     1.000    65
  PUBLIC PARK                B        6.06      0.75     0.850    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        3.35      0.75     0.500    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.97      0.75     0.600    56
  RESIDENTIAL
  ".4 DWELLING/ACRE"         B        0.23      0.75     0.900    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) =   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      Q        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
```

```
 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
 "5-7 DWELLINGS/ACRE"       B       17.62      0.75     0.500    56
 COMMERCIAL                 B        0.37      0.75     0.100    56
 PUBLIC PARK                B        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
```



```
 UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =    14283.6
 LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21471.00 =   55971.39 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) =    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
```