CITY OF REDLANDS

MASTER PLAN OF DRAINAGE (MPD)

RBF CONSULTING
A Baker Company

TECHNICAL APPENDIX A.4

Opal Basin Hydrology (AMC II)
(100-year)

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             RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 SAN BERNARDINO CO. HYDROLOGY CRITERION)
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 ************************* DESCRIPTION OF STUDY *************************
* REDLANDS MPD  - UPDATE                                                 *
* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 20968                      *
* 100-YR  HC ULTIMATE CONDITION    FEB 2014   DMALOTT                    *
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  FILE NAME: LR0209ZZ.DAT
  TIME/DATE OF STUDY: 13:57 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 0.0313 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  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

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  FLOW PROCESS FROM NODE  20901.00 TO NODE  20902.00 IS CODE =  63
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  >>>>>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.

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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) =      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.

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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) =      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.

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  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.

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  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
```

```
 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
```



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 * 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
```



```
  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 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
```

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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) =   0.80

    **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
```



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    **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
```



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  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
```

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  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
  COMMERCIAL                 B        3.97      0.75     0.100    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
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.411
  SUBAREA AREA(ACRES) =   13.38      SUBAREA RUNOFF(CFS) =   32.65
  EFFECTIVE AREA(ACRES) =     28.78   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.40
```



```
  TOTAL AREA(ACRES) =       28.8       PEAK FLOW RATE(CFS) =      70.40

  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  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) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.40
  EFFECTIVE STREAM AREA(ACRES) =      28.78
  TOTAL STREAM AREA(ACRES) =      28.78
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      70.40
  ** CONFLUENCE DATA **
  STREAM      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1      3254.49   39.87     3993.76    20620.00
     2        70.40   13.78       28.78    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) =     4022.5
  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) =     923.27
  PEAK FLOW RATE(CFS) =    3263.80

****************************************************************************
  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) =     3263.80    Tc(MIN.) =   39.87
  AREA-AVERAGED Fm(INCH/HR) =  0.48    Ybar = 0.51
  TOTAL AREA(ACRES) =     4022.5
  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) =    10020.8
  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) =    2505.02
  PEAK FLOW RATE(CFS) =    6041.92

****************************************************************************
  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) =    6041.92
  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.)= 68.9%;VALLEY(UNDEV.)/DESERT= 31.1%
           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) =    10044.1
```

```
 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) =    2513.42
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    6036.01
 TOTAL AREA(ACRES) =    10044.1       PEAK FLOW RATE(CFS) =    6041.92
 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  20965.00 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) =   460.00   MANNING'S N =  0.014
 GIVEN BOX BASEWIDTH(FEET) =  23.00   GIVEN BOX HEIGHT(FEET) =  10.00
 FLOWDEPTH IN BOX IS  5.64 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  46.55
 BOX-FLOW(CFS) =    6041.92
 BOX-FLOW TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =   47.51
 LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  20965.00 =   36616.63 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  20965.00 TO NODE  20965.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  4
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 PEAK FLOW RATE(CFS) =    6041.92    Tc(MIN.) =   47.51
 AREA-AVERAGED Fm(INCH/HR) =  0.52   Ybar = 0.52
 TOTAL AREA(ACRES) =    10044.1

****************************************************************************
 FLOW PROCESS FROM NODE  20964.00 TO NODE  20965.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   311.00
 ELEVATION DATA: UPSTREAM(FEET) =   1357.00  DOWNSTREAM(FEET) =   1347.00

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.005
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.970
 SUBAREA Tc 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        2.14      0.75     0.600    56    8.14
 COMMERCIAL                 B        1.60      0.75     0.100    56    6.01
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.386
 SUBAREA RUNOFF(CFS) =     15.76
 TOTAL AREA(ACRES) =      3.74   PEAK FLOW RATE(CFS) =     15.76
```



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

****************************************************************************
 FLOW PROCESS FROM NODE  20965.00 TO NODE  20965.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  4
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    6.01
 RAINFALL INTENSITY(INCH/HR) =   4.97
 AREA-AVERAGED Fm(INCH/HR) =  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.75
 AREA-AVERAGED Ap =  0.39
 EFFECTIVE STREAM AREA(ACRES) =       3.74
 TOTAL STREAM AREA(ACRES) =       3.74
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      15.76

****************************************************************************
 FLOW PROCESS FROM NODE  20970.00 TO NODE  20971.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   482.00
 ELEVATION DATA: UPSTREAM(FEET) =   1394.00  DOWNSTREAM(FEET) =   1386.00

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.167
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.132
 SUBAREA Tc 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        2.37      0.75     0.100    56    8.17
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =      8.65
 TOTAL AREA(ACRES) =      2.37   PEAK FLOW RATE(CFS) =      8.65

 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  20971.00 TO NODE  20972.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1386.00  DOWNSTREAM(FEET) =  1384.00
 FLOW LENGTH(FEET) =   295.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.44
 GIVEN PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       8.65
 PIPE TRAVEL TIME(MIN.) =   0.90    Tc(MIN.) =    9.07
 LONGEST FLOWPATH FROM NODE  20970.00 TO NODE  20972.00 =     777.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  20972.50 TO NODE  20972.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   517.00
  ELEVATION DATA: UPSTREAM(FEET) =   1389.00  DOWNSTREAM(FEET) =   1384.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.358
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.808
  SUBAREA Tc 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        0.07      0.75     0.850    56   14.87
  COMMERCIAL                B        3.16      0.75     0.100    56    9.36
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.116
  SUBAREA AREA(ACRES) =    3.23   INITIAL SUBAREA RUNOFF(CFS) =   10.82

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =    9.07
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.880
  SUBAREA AREA(ACRES) =    3.23      SUBAREA RUNOFF(CFS) =   11.03
  EFFECTIVE AREA(ACRES) =      5.60   AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.11
  TOTAL AREA(ACRES) =        5.6       PEAK FLOW RATE(CFS) =      19.14

  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  20972.00 TO NODE  20973.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1384.00  DOWNSTREAM(FEET) =  1374.00
  FLOW LENGTH(FEET) =   320.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  12.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.85
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      19.14
  PIPE TRAVEL TIME(MIN.) =   0.45    Tc(MIN.) =    9.52
  LONGEST FLOWPATH FROM NODE  20970.00 TO NODE  20973.00 =    1097.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20973.50 TO NODE  20973.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   597.00
  ELEVATION DATA: UPSTREAM(FEET) =   1383.00  DOWNSTREAM(FEET) =   1374.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
```



```
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.070
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.880
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                B        3.61      0.75     0.100    56    9.07
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    3.61   INITIAL SUBAREA RUNOFF(CFS) =   12.36

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =    9.52
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.769
  SUBAREA AREA(ACRES) =    3.61      SUBAREA RUNOFF(CFS) =   12.00
  EFFECTIVE AREA(ACRES) =      9.21   AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.11
  TOTAL AREA(ACRES) =        9.2       PEAK FLOW RATE(CFS) =      30.59

  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  20973.00 TO NODE  20974.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1374.00  DOWNSTREAM(FEET) =  1368.00
  FLOW LENGTH(FEET) =   313.00   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.74
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      30.59
  PIPE TRAVEL TIME(MIN.) =   0.54    Tc(MIN.) =   10.06
  LONGEST FLOWPATH FROM NODE  20970.00 TO NODE  20974.00 =    1410.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20974.50 TO NODE  20974.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   599.00
  ELEVATION DATA: UPSTREAM(FEET) =   1376.00  DOWNSTREAM(FEET) =   1368.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.305
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.821
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                B        3.67      0.75     0.100    56    9.30
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    3.67   INITIAL SUBAREA RUNOFF(CFS) =   12.38

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
```

```
  MAINLINE Tc(MIN.) =   10.06
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.647
  SUBAREA AREA(ACRES) =    3.67      SUBAREA RUNOFF(CFS) =   11.80
  EFFECTIVE AREA(ACRES) =     12.88   AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       12.9       PEAK FLOW RATE(CFS) =      41.38

  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  20974.00 TO NODE  20975.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1368.00  DOWNSTREAM(FEET) =  1364.00
  FLOW LENGTH(FEET) =   237.00   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.17
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      41.38
  PIPE TRAVEL TIME(MIN.) =   0.30    Tc(MIN.) =   10.36
  LONGEST FLOWPATH FROM NODE  20970.00 TO NODE  20975.00 =    1647.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20975.50 TO NODE  20975.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   549.00
  ELEVATION DATA: UPSTREAM(FEET) =   1370.00  DOWNSTREAM(FEET) =   1364.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.354
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.809
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        3.48      0.75     0.100    56    9.35
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.25      0.75     0.600    56   12.68
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.134
  SUBAREA AREA(ACRES) =    3.73   INITIAL SUBAREA RUNOFF(CFS) =   12.45

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =   10.36
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.584
  SUBAREA AREA(ACRES) =    3.73      SUBAREA RUNOFF(CFS) =   11.69
  EFFECTIVE AREA(ACRES) =     16.61   AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.11
  TOTAL AREA(ACRES) =       16.6       PEAK FLOW RATE(CFS) =      52.33

  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  20975.00 TO NODE  20976.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1364.00  DOWNSTREAM(FEET) =  1358.00
  FLOW LENGTH(FEET) =   338.00   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.66
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      52.33
  PIPE TRAVEL TIME(MIN.) =   0.34    Tc(MIN.) =   10.69
  LONGEST FLOWPATH FROM NODE  20970.00 TO NODE  20976.00 =    1985.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20976.50 TO NODE  20976.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   626.00
  ELEVATION DATA: UPSTREAM(FEET) =   1365.00  DOWNSTREAM(FEET) =   1358.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.813
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.701
  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
  "3-4 DWELLINGS/ACRE"       B        0.94      0.75     0.600    56   13.30
  COMMERCIAL                 B        2.21      0.75     0.100    56    9.81
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.249
  SUBAREA AREA(ACRES) =    3.15   INITIAL SUBAREA RUNOFF(CFS) =    9.97

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =   10.69
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.515
  SUBAREA AREA(ACRES) =    3.15      SUBAREA RUNOFF(CFS) =    9.44
  EFFECTIVE AREA(ACRES) =     19.76   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.13
  TOTAL AREA(ACRES) =       19.8       PEAK FLOW RATE(CFS) =      60.75

  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  20976.00 TO NODE  20965.00 IS CODE =  33
----------------------------------------------------------------------------
  >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1358.00
  DOWNSTREAM NODE ELEVATION(FEET) =  1347.00
```

```
  FLOW LENGTH(FEET) =   323.00   MANNING'S N =  0.013

  USER SPECIFIED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  USER SPECIFIED PIPE SYSTEM UNDER PRESSURE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.24
  PIPE-FLOW(CFS) =      38.48
  PIPEFLOW TRAVEL TIME(MIN.) =   0.44    Tc(MIN.) =  11.13
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.431
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.26      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.600
  SUBAREA AREA(ACRES) =    2.26      SUBAREA RUNOFF(CFS) =    6.07
  EFFECTIVE AREA(ACRES) =     22.02    AREA-AVERAGED Fm(INCH/HR) =  0.14
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.18
  TOTAL AREA(ACRES) =       22.0        PEAK FLOW RATE(CFS) =      65.32

  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) =   0.70
  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) =   26.84
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.46
    HALFSTREET FLOOD WIDTH(FEET) =   16.63
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.65
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.13
  LONGEST FLOWPATH FROM NODE  20970.00 TO NODE  20965.00 =    2308.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20965.00 TO NODE  20965.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  4
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.13
  RAINFALL INTENSITY(INCH/HR) =   3.43
  AREA-AVERAGED Fm(INCH/HR) =  0.14
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.18
  EFFECTIVE STREAM AREA(ACRES) =      22.02
  TOTAL STREAM AREA(ACRES) =      22.02
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      65.32
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  20977.00 TO NODE  20965.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   404.00
  ELEVATION DATA: UPSTREAM(FEET) =   1355.00  DOWNSTREAM(FEET) =   1347.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.347
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.404
  SUBAREA Tc 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        4.50      0.75     0.100    56    7.35
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     17.53
  TOTAL AREA(ACRES) =      4.50   PEAK FLOW RATE(CFS) =     17.53

  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  20965.00 TO NODE  20965.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  4
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  4 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.35
  RAINFALL INTENSITY(INCH/HR) =   4.40
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       4.50
  TOTAL STREAM AREA(ACRES) =       4.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      17.53
  ** CONFLUENCE DATA **
  STREAM      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1      6041.92   47.51    10044.14    20120.00
     2        15.76    6.01        3.74    20964.00
     3        65.32   11.13       22.02    20970.00
     4        17.53    7.35        4.50    20977.00

  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.)= 69.0%;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) =    10074.4
```

```
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  20965.00 =   36616.63 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0275; Lca/L=0.4,n=.0247; Lca/L=0.5,n=.0227;Lca/L=0.6,n=.0212
  TIME OF PEAK FLOW(HR) = 16.67  RUNOFF VOLUME(AF) =    2524.75
  PEAK FLOW RATE(CFS) =    6044.65

****************************************************************************
  FLOW PROCESS FROM NODE  20965.00 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) =  1347.00  DOWNSTREAM(FEET) =  1335.00
  FLOW LENGTH(FEET) =   466.11   MANNING'S N =  0.014
  GIVEN BOX BASEWIDTH(FEET) =  23.00   GIVEN BOX HEIGHT(FEET) =  10.00
  FLOWDEPTH IN BOX IS  6.13 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  42.88
  BOX-FLOW(CFS) =    6044.65
  BOX-FLOW TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =   47.69
  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 =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  PEAK FLOW RATE(CFS) =    6044.65    Tc(MIN.) =   47.69
  AREA-AVERAGED Fm(INCH/HR) =  0.52   Ybar = 0.52
  TOTAL AREA(ACRES) =    10074.4

****************************************************************************
  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) =   478.00
  ELEVATION DATA: UPSTREAM(FEET) =   1365.00  DOWNSTREAM(FEET) =   1358.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.347
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.079
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        3.00      0.75     0.100    56    8.35
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     10.81
  TOTAL AREA(ACRES) =      3.00   PEAK FLOW RATE(CFS) =     10.81

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.85; 24HR = 5.50

****************************************************************************
  FLOW PROCESS FROM NODE  20961.00 TO NODE  20962.00 IS CODE =  33
----------------------------------------------------------------------------
```



```
  >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1358.00
  DOWNSTREAM NODE ELEVATION(FEET) =  1357.00
  FLOW LENGTH(FEET) =   347.00   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  17.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.37
  PIPE-FLOW(CFS) =      10.81
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   1.42    Tc(MIN.) =   9.77
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.711
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        3.09      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) =     3.09      SUBAREA RUNOFF(CFS) =   10.11
  EFFECTIVE AREA(ACRES) =      6.09    AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        6.1        PEAK FLOW RATE(CFS) =      19.93

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.85; 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) =    9.12
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.48
    HALFSTREET FLOOD WIDTH(FEET) =   17.73
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.40
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.67
  LONGEST FLOWPATH FROM NODE  20960.00 TO NODE  20962.00 =     825.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20962.00 TO NODE  20963.00 IS CODE =  33
----------------------------------------------------------------------------
  >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1357.00
  DOWNSTREAM NODE ELEVATION(FEET) =  1353.00
  FLOW LENGTH(FEET) =   353.00   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.) =   8.57
 PIPE-FLOW(CFS) =      19.93
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME(MIN.) =   0.74    Tc(MIN.) =  10.51
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.553
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B        2.86      0.75     0.100    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 =  0.220
 SUBAREA AREA(ACRES) =    3.76      SUBAREA RUNOFF(CFS) =   11.47
 EFFECTIVE AREA(ACRES) =      9.85    AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.15
 TOTAL AREA(ACRES) =        9.9        PEAK FLOW RATE(CFS) =      30.53

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.85; 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) =   10.60
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.41
   HALFSTREET FLOOD WIDTH(FEET) =   14.29
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.45
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.01
 LONGEST FLOWPATH FROM NODE  20960.00 TO NODE  20963.00 =    1178.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  20963.00 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) =  1353.00
 DOWNSTREAM NODE ELEVATION(FEET) =  1335.00
 FLOW LENGTH(FEET) =   742.00   MANNING'S N =  0.013

 USER SPECIFIED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
 DEPTH OF FLOW IN  30.0 INCH PIPE IS  14.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  12.87
 PIPE-FLOW(CFS) =      30.53
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME(MIN.) =   1.02    Tc(MIN.) =  11.53
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.360
```



```
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B        3.02      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) =    3.02      SUBAREA RUNOFF(CFS) =    8.93
 EFFECTIVE AREA(ACRES) =     12.87    AREA-AVERAGED Fm(INCH/HR) =  0.10
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.13
 TOTAL AREA(ACRES) =       12.9        PEAK FLOW RATE(CFS) =      37.75

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.85; 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) =    7.22
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.34
   HALFSTREET FLOOD WIDTH(FEET) =   10.46
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.98
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.00
 LONGEST FLOWPATH FROM NODE  20960.00 TO NODE  20968.00 =    1920.00 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.) =   11.53
 RAINFALL INTENSITY(INCH/HR) =   3.36
 AREA-AVERAGED Fm(INCH/HR) =  0.10
 AREA-AVERAGED Fp(INCH/HR) =  0.75
 AREA-AVERAGED Ap =  0.13
 EFFECTIVE STREAM AREA(ACRES) =      12.87
 TOTAL STREAM AREA(ACRES) =      12.87
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      37.75
 ** CONFLUENCE DATA **
 STREAM      Q        Tc      AREA      HEADWATER
 NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
    1      6044.65   47.69    10074.40    20120.00
    2        37.75   11.53       12.87    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) = 0.79; 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) =    10087.3
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  20968.00 =   37082.74 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0273; Lca/L=0.4,n=.0245; Lca/L=0.5,n=.0225;Lca/L=0.6,n=.0210
  TIME OF PEAK FLOW(HR) = 16.67  RUNOFF VOLUME(AF) =    2529.83
  PEAK FLOW RATE(CFS) =    6038.18
    (UPSTREAM NODE PEAK FLOW RATE(CFS) =    6044.65)
  PEAK FLOW RATE(CFS) USED =    6044.65

****************************************************************************
  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)     =    10087.3  TC(MIN.) =     47.69
  AREA-AVERAGED Fm(INCH/HR)=  0.52   Ybar =  0.52
  PEAK FLOW RATE(CFS)   =   6044.65
============================================================================
============================================================================
  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:

                              RBF Consulting
                            14257 Alton Parkway
                                 Irvine, CA
                                   92618

 ************************* DESCRIPTION OF STUDY *************************
* REDLANDS MPD  - UPDATE                                                 *
* REVISED RATIONAL METHOD HYDROLOGY - TO NODE 21070                      *
* 100-YR  HC ULTIMATE CONDITION    FEB 2014   DMALOTT                    *
 ************************************************************************

  FILE NAME: LR0210ZZ.DAT
  TIME/DATE OF STUDY: 13:58 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  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
```

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

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

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



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

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

****************************************************************************
 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
 "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

 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
```

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--------------------------------------------------------------------------------
  >>>>>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
  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<<<<<
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============================================================================
  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

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

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

    **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):
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 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
  * 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
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  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
  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:
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  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):
  5M = 0.46; 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.

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  FLOW PROCESS FROM NODE  21026.00 TO NODE  21027.00 IS CODE =  63
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  >>>>>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.

****************************************************************************
  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
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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) =      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
  STREET HALFWIDTH(FEET) = 18.00

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

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



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    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<<<<<
============================================================================
  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 =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   24.16
  * 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
  COMMERCIAL                 B        0.11      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        9.57      0.75     0.600    56
  SCHOOL                     B        4.31      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.596
  SUBAREA AREA(ACRES) =   13.99      SUBAREA RUNOFF(CFS) =   21.55
  EFFECTIVE AREA(ACRES) =    211.51   AREA-AVERAGED Fm(INCH/HR) =  0.35
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.46
  TOTAL AREA(ACRES) =      220.8       PEAK FLOW RATE(CFS) =     344.94

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

****************************************************************************
  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  1.85 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  15.54
  BOX-FLOW(CFS) =     344.94
  BOX-FLOW TRAVEL TIME(MIN.) =   0.71    Tc(MIN.) =   24.87
  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 =  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) =     6044.65    Tc(MIN.) =   47.69
  AREA-AVERAGED Fm(INCH/HR) =  0.52    Ybar = 0.52
  TOTAL AREA(ACRES) =    10087.3
  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) =     6044.65    Tc(MIN.) =   47.69
  AREA-AVERAGED Fm(INCH/HR) =  0.52    Ybar = 0.52
  TOTAL AREA(ACRES) =    10087.3
  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  21093.00 IS CODE =  48
----------------------------------------------------------------------------
  >>>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1348.00  DOWNSTREAM(FEET) =  1339.00
  FLOW LENGTH(FEET) =   471.00   MANNING'S N =  0.014
  GIVEN BOX BASEWIDTH(FEET) =  23.00   GIVEN BOX HEIGHT(FEET) =  10.00
  FLOWDEPTH IN BOX IS  6.80 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  38.64
  BOX-FLOW(CFS) =    6044.65
  BOX-FLOW TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =   47.90
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21093.00 =   37553.74 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21093.00 TO NODE  21093.00 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) =    6044.65    Tc(MIN.) =   47.90
  AREA-AVERAGED Fm(INCH/HR) =  0.52   Ybar = 0.52
  TOTAL AREA(ACRES) =    10087.3

****************************************************************************
  FLOW PROCESS FROM NODE  21090.00 TO NODE  21091.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   594.00
  ELEVATION DATA: UPSTREAM(FEET) =   1349.00  DOWNSTREAM(FEET) =   1338.00
```

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.687
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.985
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        3.24      0.75     0.100    56    8.69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     11.40
  TOTAL AREA(ACRES) =      3.24   PEAK FLOW RATE(CFS) =     11.40

  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  21091.00 TO NODE  21092.00 IS CODE =  33
----------------------------------------------------------------------------
  >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1338.00
  DOWNSTREAM NODE ELEVATION(FEET) =   615.00
  FLOW LENGTH(FEET) =   401.00   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   3.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  46.25
  PIPE-FLOW(CFS) =      11.40
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =   8.84
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.944
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        4.20      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) =    4.20      SUBAREA RUNOFF(CFS) =   14.63
  EFFECTIVE AREA(ACRES) =      7.44    AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        7.4        PEAK FLOW RATE(CFS) =      25.91

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

  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) =   0.36
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0180
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200
  STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =   14.50
```



```
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.23
    HALFSTREET FLOOD WIDTH(FEET) =    5.13
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   19.02
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.35
  LONGEST FLOWPATH FROM NODE  21090.00 TO NODE  21092.00 =     995.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21092.00 TO NODE  21093.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1340.00  DOWNSTREAM(FEET) =  1339.00
  FLOW LENGTH(FEET) =   215.00   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.25
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      25.91
  PIPE TRAVEL TIME(MIN.) =   0.43    Tc(MIN.) =    9.27
  LONGEST FLOWPATH FROM NODE  21090.00 TO NODE  21093.00 =    1210.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21093.00 TO NODE  21093.00 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.) =    9.27
  RAINFALL INTENSITY(INCH/HR) =   3.83
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       7.44
  TOTAL STREAM AREA(ACRES) =       7.44
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      25.91
  ** CONFLUENCE DATA **
  STREAM      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1      6044.65   47.90    10087.27    20120.00
     2        25.91    9.27        7.44    21090.00

  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) =    10094.7
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21093.00 =   37553.74 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) = 16.67  RUNOFF VOLUME(AF) =    2532.85
  PEAK FLOW RATE(CFS) =    6024.95
    (UPSTREAM NODE PEAK FLOW RATE(CFS) =    6044.65)
  PEAK FLOW RATE(CFS) USED =    6044.65

****************************************************************************
  FLOW PROCESS FROM NODE  21093.00 TO NODE  21093.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   47.90
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.431
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        9.63      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) =    9.63
  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) =    10104.3
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21093.00 =   37553.74 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) = 16.67  RUNOFF VOLUME(AF) =    2536.76
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    6032.46
  TOTAL AREA(ACRES) =    10104.3       PEAK FLOW RATE(CFS) =    6044.65
  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  21093.00 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) =  1339.00  DOWNSTREAM(FEET) =  1337.00
  FLOW LENGTH(FEET) =   362.00   MANNING'S N =  0.014
  GIVEN BOX BASEWIDTH(FEET) =  23.00   GIVEN BOX HEIGHT(FEET) =  10.00
  *GIVEN BOX HEIGHT(FEET) =  10.00   ESTIMATED BOX BASEWIDTH(FEET) =   33.78
  ASSUME FULL-FLOWING BOX   BOX-FLOW VELOCITY(FEET/SEC.) =  17.89
  BOX-FLOW(CFS) =    6044.65
  BOX-FLOW TRAVEL TIME(MIN.) =   0.34    Tc(MIN.) =   48.23
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21044.00 =   37915.74 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) =     6044.65    Tc(MIN.) =   48.23
  AREA-AVERAGED Fm(INCH/HR) =  0.52    Ybar = 0.52
  TOTAL AREA(ACRES) =    10104.3
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21044.00 =   37915.74 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      344.94   24.83    2.122  0.75( 0.35) 0.46     211.5   21020.00
      2      333.46   27.42    2.000  0.75( 0.35) 0.47     220.4   21010.00
      3      332.32   27.57    1.993  0.75( 0.35) 0.47     220.8   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.)= 69.8%;VALLEY(UNDEV.)/DESERT= 30.2%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.80; 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 = 0.68;
  3HR = 0.94; 6HR = 0.97; 24HR= 0.98
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =    10325.1
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21044.00 =   37915.74 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) = 16.67  RUNOFF VOLUME(AF) =    2596.27
  PEAK FLOW RATE(CFS) =    6126.58

****************************************************************************
  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  21044.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   48.23
  * 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
  COMMERCIAL                 B        2.03      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.70      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.449
  SUBAREA AREA(ACRES) =    6.73
  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.)= 69.8%;VALLEY(UNDEV.)/DESERT= 30.2%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
```

```
  Tc(HR) = 0.80; 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 = 0.68;
  3HR = 0.94; 6HR = 0.97; 24HR= 0.98
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =    10331.9
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21044.00 =   37915.74 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) = 16.67  RUNOFF VOLUME(AF) =    2598.21
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    6130.69
  TOTAL AREA(ACRES) =    10331.9       PEAK FLOW RATE(CFS) =    6130.69

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

****************************************************************************
  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) =    6130.69
  FLOW VELOCITY(FEET/SEC.) =  33.08   FLOW DEPTH(FEET) =   6.58
  TRAVEL TIME(MIN.) =   0.70   Tc(MIN.) =   48.93
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21045.00 =   39300.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21045.00 TO NODE  21045.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  21080.00 TO NODE  21081.00 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) =  3.637
  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.)
  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) =     27.01
  TOTAL AREA(ACRES) =      8.79   PEAK FLOW RATE(CFS) =     27.01

  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  21081.00 TO NODE  21082.00 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) =      32.87
    ***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.) =    2.31
    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) =  3.259
  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) =   11.71
  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) =      35.74

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

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.68   HALFSTREET FLOOD WIDTH(FEET) =  26.86
  FLOW VELOCITY(FEET/SEC.) =  2.36   DEPTH*VELOCITY(FT*FT/SEC.) =   1.60
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  280.7 FT WITH ELEVATION-DROP =   1.0 FT, IS   14.2 CFS,
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       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE  21082.00
  LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21082.00 =    1215.82 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21082.00 TO NODE  21083.00 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) =      40.44
    ***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.) =    1.61
  STREET FLOW TRAVEL TIME(MIN.) =   1.45   Tc(MIN.) =   13.60
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.046
  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) =    9.40
  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) =      42.63

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

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.75   HALFSTREET FLOOD WIDTH(FEET) =  30.52
  FLOW VELOCITY(FEET/SEC.) =  2.20   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  21083.00
  LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21083.00 =    1404.92 FEET.
```



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****************************************************************************
  FLOW PROCESS FROM NODE  21083.00 TO NODE  21084.00 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) =      46.91
    ***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.) =   1.52   Tc(MIN.) =   15.12
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.858
  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) =    8.56
  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) =      48.36

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

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.79   HALFSTREET FLOOD WIDTH(FEET) =  32.48
  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  21084.00
  LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21084.00 =    1606.51 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21084.00 TO NODE  21087.00 IS CODE =  41
----------------------------------------------------------------------------
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```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1358.00  DOWNSTREAM(FEET) =  1356.50
  FLOW LENGTH(FEET) =   750.64   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.03
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      48.36
  PIPE TRAVEL TIME(MIN.) =   2.49    Tc(MIN.) =   17.61
  LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21087.00 =    2357.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21087.00 TO NODE  21087.00 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.) =   17.61
  RAINFALL INTENSITY(INCH/HR) =   2.61
  AREA-AVERAGED Fm(INCH/HR) =  0.22
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.30
  EFFECTIVE STREAM AREA(ACRES) =      20.39
  TOTAL STREAM AREA(ACRES) =      20.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      48.36

****************************************************************************
  FLOW PROCESS FROM NODE  21085.00 TO NODE  21084.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   560.00
  ELEVATION DATA: UPSTREAM(FEET) =   1358.50  DOWNSTREAM(FEET) =   1358.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   15.559
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.809
  SUBAREA Tc 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        0.14      0.98     0.500    32   19.91
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        1.29      0.75     0.500    56   19.91
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.85      0.75     0.600    56   21.09
  COMMERCIAL                 B        1.55      0.75     0.100    56   15.56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.76
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.360
  SUBAREA RUNOFF(CFS) =      8.74
  TOTAL AREA(ACRES) =      3.83   PEAK FLOW RATE(CFS) =      8.74

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



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****************************************************************************
  FLOW PROCESS FROM NODE  21085.00 TO NODE  21086.00 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) =      13.43
    ***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.) =    1.53
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.83
  STREET FLOW TRAVEL TIME(MIN.) =   2.27   Tc(MIN.) =   17.83
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.589
  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) =    9.36
  EFFECTIVE AREA(ACRES) =      8.20    AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.79  AREA-AVERAGED Ap =  0.30
  TOTAL AREA(ACRES) =        8.2        PEAK FLOW RATE(CFS) =      17.35

  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) = 0.58   HALFSTREET FLOOD WIDTH(FEET) =  22.04
  FLOW VELOCITY(FEET/SEC.) =  1.66   DEPTH*VELOCITY(FT*FT/SEC.) =   0.96
  *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  21086.00
  LONGEST FLOWPATH FROM NODE  21085.00 TO NODE  21086.00 =     767.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21086.00 TO NODE  21087.00 IS CODE =  63
```

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------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
==============================================================================
  UPSTREAM ELEVATION(FEET) = 1357.00  DOWNSTREAM ELEVATION(FEET) = 1356.50
  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) =      23.38
    ***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.) =    1.52
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.03
  STREET FLOW TRAVEL TIME(MIN.) =   3.76   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
  "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) =   12.05
  EFFECTIVE AREA(ACRES) =     14.61    AREA-AVERAGED Fm(INCH/HR) =  0.23
  AREA-AVERAGED Fp(INCH/HR) =  0.83  AREA-AVERAGED Ap =  0.28
  TOTAL AREA(ACRES) =       14.6        PEAK FLOW RATE(CFS) =      27.32

  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) = 0.72   HALFSTREET FLOOD WIDTH(FEET) =  28.75
  FLOW VELOCITY(FEET/SEC.) =  1.58   DEPTH*VELOCITY(FT*FT/SEC.) =   1.13
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  341.5 FT WITH ELEVATION-DROP =   0.5 FT, IS   18.1 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE  21087.00
  LONGEST FLOWPATH FROM NODE  21085.00 TO NODE  21087.00 =    1109.05 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21087.00 TO NODE  21087.00 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.) =   21.58
  RAINFALL INTENSITY(INCH/HR) =   2.31
  AREA-AVERAGED Fm(INCH/HR) =  0.23
  AREA-AVERAGED Fp(INCH/HR) =  0.83
  AREA-AVERAGED Ap =  0.28
  EFFECTIVE STREAM AREA(ACRES) =      14.61
  TOTAL STREAM AREA(ACRES) =      14.61
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      27.32

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       48.36   17.61    2.608  0.75( 0.22) 0.30      20.4   21080.00
      2       27.32   21.58    2.308  0.83( 0.23) 0.28      14.6   21085.00

  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       73.86   17.61    2.608  0.78( 0.23) 0.29      32.3   21080.00
      2       69.60   21.58    2.308  0.78( 0.23) 0.29      35.0   21085.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      73.86    Tc(MIN.) =    17.61
  EFFECTIVE AREA(ACRES) =      32.31   AREA-AVERAGED Fm(INCH/HR) =  0.23
  AREA-AVERAGED Fp(INCH/HR) =  0.78  AREA-AVERAGED Ap =  0.29
  TOTAL AREA(ACRES) =       35.0
  LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21087.00 =    2357.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21087.00 TO NODE  21088.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1356.00  DOWNSTREAM(FEET) =  1336.00
  FLOW LENGTH(FEET) =  1357.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  22.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.52
  GIVEN PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      73.86
  PIPE TRAVEL TIME(MIN.) =   1.81    Tc(MIN.) =   19.42
  LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21088.00 =    3714.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21088.50 TO NODE  21088.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
==============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =  1495.00
  ELEVATION DATA: UPSTREAM(FEET) =   1354.00  DOWNSTREAM(FEET) =   1336.00
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  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.696
  * 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.)
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        3.91      0.98     0.600    32   18.56
  COMMERCIAL                 A        7.31      0.98     0.100    32   13.70
  COMMERCIAL                 B        7.68      0.75     0.100    56   13.70
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A        1.19      0.98     0.500    32   17.53
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.94
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.221
  SUBAREA AREA(ACRES) =   20.09   INITIAL SUBAREA RUNOFF(CFS) =   51.10

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =   19.42
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.460
  SUBAREA AREA(ACRES) =   20.09      SUBAREA RUNOFF(CFS) =   40.74
  EFFECTIVE AREA(ACRES) =     52.40   AREA-AVERAGED Fm(INCH/HR) =  0.22
  AREA-AVERAGED Fp(INCH/HR) =  0.83  AREA-AVERAGED Ap =  0.26
  TOTAL AREA(ACRES) =       55.1       PEAK FLOW RATE(CFS) =     105.70

  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  21088.00 TO NODE  21096.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1336.00  DOWNSTREAM(FEET) =  1335.00
  FLOW LENGTH(FEET) =   413.00   MANNING'S N =  0.014
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.65
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  54.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     105.70
  PIPE TRAVEL TIME(MIN.) =   1.04    Tc(MIN.) =   20.45
  LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21096.00 =    4127.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21096.00 TO NODE  21096.00 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.) =   20.45
  RAINFALL INTENSITY(INCH/HR) =   2.38
  AREA-AVERAGED Fm(INCH/HR) =  0.22
  AREA-AVERAGED Fp(INCH/HR) =  0.83
  AREA-AVERAGED Ap =  0.26
  EFFECTIVE STREAM AREA(ACRES) =      52.40
  TOTAL STREAM AREA(ACRES) =      55.09
```



```
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     105.70

****************************************************************************
  FLOW PROCESS FROM NODE  21094.00 TO NODE  21095.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   542.00
  ELEVATION DATA: UPSTREAM(FEET) =   1354.00  DOWNSTREAM(FEET) =   1350.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.066
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.648
  SUBAREA Tc 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                 A        3.86      0.98     0.100    32   10.07
  COMMERCIAL                 B        1.36      0.75     0.100    56   10.07
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.92
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     16.71
  TOTAL AREA(ACRES) =      5.22   PEAK FLOW RATE(CFS) =     16.71

  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  21095.00 TO NODE  21096.00 IS CODE =  33
----------------------------------------------------------------------------
  >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1350.00
  DOWNSTREAM NODE ELEVATION(FEET) =  1335.00
  FLOW LENGTH(FEET) =   850.00   MANNING'S N =  0.014

  USER SPECIFIED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  11.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.25
  PIPE-FLOW(CFS) =      16.71
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   1.63    Tc(MIN.) =  11.69
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.335
  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"       A        3.79      0.98     0.500    32
  COMMERCIAL                 B        1.00      0.75     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.96
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.416
  SUBAREA AREA(ACRES) =    4.79      SUBAREA RUNOFF(CFS) =   12.65
  EFFECTIVE AREA(ACRES) =     10.01    AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.95  AREA-AVERAGED Ap =  0.25
  TOTAL AREA(ACRES) =       10.0        PEAK FLOW RATE(CFS) =      27.88

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
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```
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.94; 6HR = 2.56; 24HR = 4.77

  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) =   11.17
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.39
    HALFSTREET FLOOD WIDTH(FEET) =   13.35
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.94
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.16
  LONGEST FLOWPATH FROM NODE  21094.00 TO NODE  21096.00 =    1392.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21096.00 TO NODE  21096.00 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.) =   11.69
  RAINFALL INTENSITY(INCH/HR) =   3.33
  AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.95
  AREA-AVERAGED Ap =  0.25
  EFFECTIVE STREAM AREA(ACRES) =      10.01
  TOTAL STREAM AREA(ACRES) =      10.01
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      27.88

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      105.70   20.45    2.384  0.83( 0.22) 0.26      52.4   21080.00
      1       98.13   24.53    2.138  0.83( 0.22) 0.26      55.1   21085.00
      2       27.88   11.69    3.335  0.95( 0.24) 0.25      10.0   21094.00

  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      114.83   11.69    3.335  0.86( 0.22) 0.26      40.0   21094.00
      2      125.02   20.45    2.384  0.85( 0.22) 0.26      62.4   21080.00
      3      115.23   24.53    2.138  0.85( 0.22) 0.26      65.1   21085.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     125.02    Tc(MIN.) =    20.45
  EFFECTIVE AREA(ACRES) =      62.41   AREA-AVERAGED Fm(INCH/HR) =  0.22
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  AREA-AVERAGED Fp(INCH/HR) =  0.85  AREA-AVERAGED Ap =  0.26
  TOTAL AREA(ACRES) =       65.1
  LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21096.00 =    4127.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21096.00 TO NODE  21097.00 IS CODE =  33
----------------------------------------------------------------------------
  >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1335.00
  DOWNSTREAM NODE ELEVATION(FEET) =  1317.00
  FLOW LENGTH(FEET) =  1424.00   MANNING'S N =  0.014

  USER SPECIFIED PIPE DIAMETER(INCH) =  60.00    NUMBER OF PIPES =   1
  DEPTH OF FLOW IN  60.0 INCH PIPE IS  28.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.56
  PIPE-FLOW(CFS) =     125.02
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   1.86    Tc(MIN.) =  22.31
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.263
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       23.81      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       12.27      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.270
  SUBAREA AREA(ACRES) =   36.08      SUBAREA RUNOFF(CFS) =   66.93
  EFFECTIVE AREA(ACRES) =     98.49    AREA-AVERAGED Fm(INCH/HR) =  0.21
  AREA-AVERAGED Fp(INCH/HR) =  0.81  AREA-AVERAGED Ap =  0.26
  TOTAL AREA(ACRES) =      101.2        PEAK FLOW RATE(CFS) =     181.57

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.94; 6HR = 2.56; 24HR = 4.77

  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) =   56.55
    ***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.) =    4.22
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.72
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  1424.0 FT WITH ELEVATION-DROP =  18.0 FT, IS   93.7 CFS,
         WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE  21097.00
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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      193.91   13.59    3.047  0.80( 0.21) 0.27      76.0   21094.00
     2      181.57   22.31    2.263  0.81( 0.21) 0.26      98.5   21080.00
     3      166.57   26.43    2.044  0.81( 0.22) 0.27     101.2   21085.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     193.91  Tc(MIN.) =   13.59
 AREA-AVERAGED Fm(INCH/HR) =  0.21  AREA-AVERAGED Fp(INCH/HR) =  0.80
 AREA-AVERAGED Ap =  0.27  EFFECTIVE AREA(ACRES) =      76.05
 LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21097.00 =    5551.15 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  21097.00 TO NODE  21045.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1317.00  DOWNSTREAM(FEET) =  1295.00
 FLOW LENGTH(FEET) =   885.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  66.0 INCH PIPE IS  28.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  19.37
 GIVEN PIPE DIAMETER(INCH) =  66.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     193.91
 PIPE TRAVEL TIME(MIN.) =   0.76    Tc(MIN.) =   14.35
 LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21045.00 =    6436.15 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  21045.50 TO NODE  21045.00 IS CODE =  82
----------------------------------------------------------------------------
 >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
 >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =  1687.00
 ELEVATION DATA: UPSTREAM(FEET) =   1340.00  DOWNSTREAM(FEET) =   1295.00

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.260
 * 100 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
 "3-4 DWELLINGS/ACRE"       B        6.36      0.75     0.600    56   16.62
 COMMERCIAL                 B       19.28      0.75     0.100    56   12.26
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.224
 SUBAREA AREA(ACRES) =   25.64   INITIAL SUBAREA RUNOFF(CFS) =   70.93

 ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
 MAINLINE Tc(MIN.) =   14.35
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.949
 SUBAREA AREA(ACRES) =   25.64      SUBAREA RUNOFF(CFS) =   64.18
 EFFECTIVE AREA(ACRES) =    101.69   AREA-AVERAGED Fm(INCH/HR) =  0.26
 AREA-AVERAGED Fp(INCH/HR) =  0.80  AREA-AVERAGED Ap =  0.32
 TOTAL AREA(ACRES) =      126.8       PEAK FLOW RATE(CFS) =     246.40
```



```
 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.94; 6HR = 2.56; 24HR = 4.77

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      251.37   14.35    2.949  0.79( 0.20) 0.25     101.7   21094.00
     2      224.80   23.09    2.217  0.80( 0.20) 0.26     124.1   21080.00
     3      205.77   27.22    2.008  0.80( 0.21) 0.26     126.8   21085.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     251.37  Tc(MIN.) =   14.35
 AREA-AVERAGED Fm(INCH/HR) =  0.20  AREA-AVERAGED Fp(INCH/HR) =  0.79
 AREA-AVERAGED Ap =  0.25  EFFECTIVE AREA(ACRES) =     101.69

+----------------------------------------------------------------------------+
| 33.52 AC DRAIN WEST OF THIS STORM DRAIN INSTEAD OF EAST                    |
| TOWARDS THIS SD SYSTEM. THAT WAS REVISED ACCORDING TO AERIAL               |
| VIEWS FROM GOOGLE EARTH WHICH SHOW THAT DRAINAGE PATTERN                   |
+----------------------------------------------------------------------------+

****************************************************************************
 FLOW PROCESS FROM NODE  21045.00 TO NODE  21045.00 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      251.37   14.35    2.949  0.79( 0.20) 0.25     101.7   21094.00
     2      224.80   23.09    2.217  0.80( 0.20) 0.26     124.1   21080.00
     3      205.77   27.22    2.008  0.80( 0.21) 0.26     126.8   21085.00
 LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21045.00 =    6436.15 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
 PEAK FLOW RATE(CFS) =     6130.69    Tc(MIN.) =   48.93
 AREA-AVERAGED Fm(INCH/HR) =  0.51    Ybar = 0.52
 TOTAL AREA(ACRES) =    10331.9
 LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21045.00 =   39300.79 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= 6.11
 S-GRAPH: VALLEY(DEV.)= 70.2%;VALLEY(UNDEV.)/DESERT= 29.8%
          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) =    10458.7
 LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21045.00 =   39300.79 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0267; Lca/L=0.4,n=.0239; Lca/L=0.5,n=.0219;Lca/L=0.6,n=.0205
 TIME OF PEAK FLOW(HR) = 16.67  RUNOFF VOLUME(AF) =    2639.03
 PEAK FLOW RATE(CFS) =    6139.68

****************************************************************************
 FLOW PROCESS FROM NODE  21045.00 TO NODE  21045.00 IS CODE =  81
```

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------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN.) =   48.93
  * 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
  "5-7 DWELLINGS/ACRE"       A       20.17      0.98     0.500    32
  COMMERCIAL                 A        5.87      0.98     0.100    32
  COMMERCIAL                 B        0.05      0.75     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.409
  SUBAREA AREA(ACRES) =   26.09
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.44;30M= 0.90;1H= 1.18;3H= 1.97;6H= 2.71;24H= 6.11
  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) =    10484.8
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21045.00 =   39300.79 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0267; Lca/L=0.4,n=.0239; Lca/L=0.5,n=.0219;Lca/L=0.6,n=.0205
  TIME OF PEAK FLOW(HR) = 16.67  RUNOFF VOLUME(AF) =    2645.64
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    6154.14
  TOTAL AREA(ACRES) =    10484.8       PEAK FLOW RATE(CFS) =    6154.14

  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  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) =    6154.14
  FLOW VELOCITY(FEET/SEC.) =  32.98   FLOW DEPTH(FEET) =   6.61
  TRAVEL TIME(MIN.) =   1.39   Tc(MIN.) =   50.32
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21046.00 =   42045.56 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE  21046.00 TO NODE  21046.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN.) =   50.32
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.389
  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= 2.71;24H= 6.11
  S-GRAPH: VALLEY(DEV.)= 70.5%;VALLEY(UNDEV.)/DESERT= 29.5%
           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) =    10567.2
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21046.00 =   42045.56 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0258; Lca/L=0.4,n=.0231; Lca/L=0.5,n=.0213;Lca/L=0.6,n=.0198
  TIME OF PEAK FLOW(HR) = 16.75  RUNOFF VOLUME(AF) =    2672.92
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    6063.47
  TOTAL AREA(ACRES) =    10567.2       PEAK FLOW RATE(CFS) =    6154.14
  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 = 5.47

******************************************************************************
  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) =    6154.14
  FLOW VELOCITY(FEET/SEC.) =  29.87   FLOW DEPTH(FEET) =   6.60
  TRAVEL TIME(MIN.) =   1.52   Tc(MIN.) =   51.84
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21069.00 =   44763.59 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE  21069.00 TO NODE  21069.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
  MAINLINE Tc(MIN.) =   51.84
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  1.365
  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        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= 2.71;24H= 6.10
  S-GRAPH: VALLEY(DEV.)= 70.6%;VALLEY(UNDEV.)/DESERT= 29.4%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.86; LAG(HR) = 0.69; Fm(INCH/HR) = 0.51; Ybar = 0.51
  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) =    10613.7
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21069.00 =   44763.59 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0252; Lca/L=0.4,n=.0225; Lca/L=0.5,n=.0207;Lca/L=0.6,n=.0193
  TIME OF PEAK FLOW(HR) = 16.75  RUNOFF VOLUME(AF) =    2686.42
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    6092.66
  TOTAL AREA(ACRES) =    10613.7       PEAK FLOW RATE(CFS) =    6154.14
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.94; 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
  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
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  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,
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       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

 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.
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****************************************************************************
 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
 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
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  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
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  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
  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.
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****************************************************************************
  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
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 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
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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) =   0.97

   **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
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  ***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
 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 **
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  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.

****************************************************************************
  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
  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
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    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) =     6154.14    Tc(MIN.) =   51.84
  AREA-AVERAGED Fm(INCH/HR) =  0.51    Ybar = 0.51
  TOTAL AREA(ACRES) =    10613.7
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21069.00 =   44763.59 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.)= 71.3%;VALLEY(UNDEV.)/DESERT= 28.7%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.86; 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 = 0.67; 1HR = 0.67;
  3HR = 0.94; 6HR = 0.97; 24HR= 0.98
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =    10859.9
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21069.00 =   44763.59 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0252; Lca/L=0.4,n=.0225; Lca/L=0.5,n=.0207;Lca/L=0.6,n=.0193
  TIME OF PEAK FLOW(HR) = 16.75  RUNOFF VOLUME(AF) =    2759.35
  PEAK FLOW RATE(CFS) =    6243.58

****************************************************************************
  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) =    6243.58
  FLOW VELOCITY(FEET/SEC.) =  28.73   FLOW DEPTH(FEET) =   6.85
  TRAVEL TIME(MIN.) =   1.62   Tc(MIN.) =   53.46
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21070.00 =   47559.06 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21070.00 TO NODE  21070.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   53.46
  * 100 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
  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= 2.70;24H= 6.06
  S-GRAPH: VALLEY(DEV.)= 71.6%;VALLEY(UNDEV.)/DESERT= 28.4%
           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) =    10990.4
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21070.00 =   47559.06 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0246; Lca/L=0.4,n=.0220; Lca/L=0.5,n=.0202;Lca/L=0.6,n=.0189
  TIME OF PEAK FLOW(HR) = 16.75  RUNOFF VOLUME(AF) =    2802.15
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    6246.21
  TOTAL AREA(ACRES) =    10990.4       PEAK FLOW RATE(CFS) =    6246.21

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.79; 6HR = 2.25; 24HR = 4.75

****************************************************************************
  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)     =    10990.4  TC(MIN.) =     53.46
  AREA-AVERAGED Fm(INCH/HR)=  0.50   Ybar =  0.50
  PEAK FLOW RATE(CFS)   =   6246.21
==============================================================================
==============================================================================
  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 20968                      *
* 25-YR  HC ULTIMATE CONDITION    APRIL 2014   MCHANDOO                  *
 ************************************************************************

  FILE NAME: LR0209ZZ.DAT
  TIME/DATE OF STUDY: 15:52 04/03/2014
============================================================================
  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) = 1.2490

  *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
  *  25 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
 *  25 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
 *  25 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
  *  25 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
  *  25 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
 *  25 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
 *  25 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
 *  25 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
  *  25 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
```



```
  *  25 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
  *  25 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
  *  25 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
  *  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
  ".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
  *  25 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
  *  25 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
```



```
  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 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
  *  25 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
  *  25 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
  *  25 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
  *  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
  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
  *  25 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
  *  25 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
 *  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
 "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
 *  25 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
 *  25 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
  *  25 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
  *  25 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
  *  25 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
  *  25 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
  *  25 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
  *  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
  "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
  *  25 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
  *  25 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
  *  25 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) =     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) =     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= 0.39;30M= 0.79;1H= 1.03;3H= 1.74;6H= 2.41;24H= 5.02
  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 = 0.53
  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) =     828.78
  PEAK FLOW RATE(CFS) =    2743.70

******************************************************************************
  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  5.70 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  30.07
  BOX-FLOW(CFS) =    2743.70
  BOX-FLOW TRAVEL TIME(MIN.) =   0.34    Tc(MIN.) =   43.98
  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) =    2743.70    Tc(MIN.) =   43.98
  AREA-AVERAGED Fm(INCH/HR) =  0.48   Ybar = 0.53
  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) =  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
  *  25 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
  *  25 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
  *  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
  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
  *  25 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
  COMMERCIAL                 B        3.97      0.75     0.100    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
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.411
  SUBAREA AREA(ACRES) =   13.38      SUBAREA RUNOFF(CFS) =   32.65
  EFFECTIVE AREA(ACRES) =     28.78   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.40
```



```
  TOTAL AREA(ACRES) =       28.8       PEAK FLOW RATE(CFS) =      70.40

  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  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) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.40
  EFFECTIVE STREAM AREA(ACRES) =      28.78
  TOTAL STREAM AREA(ACRES) =      28.78
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      70.40
  ** CONFLUENCE DATA **
  STREAM      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1      2743.70   43.98     3993.76    20620.00
     2        70.40   13.78       28.78    20950.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.39;30M= 0.79;1H= 1.04;3H= 1.74;6H= 2.41;24H= 5.02
  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 = 0.53
  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) =     4022.5
  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) =     836.84
  PEAK FLOW RATE(CFS) =    2767.07

****************************************************************************
  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) =     2767.07    Tc(MIN.) =   43.98
  AREA-AVERAGED Fm(INCH/HR) =  0.48    Ybar = 0.53
  TOTAL AREA(ACRES) =     4022.5
  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= 0.39;30M= 0.80;1H= 1.05;3H= 1.79;6H= 2.52;24H= 5.48
  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) =    10020.8
  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) =    2112.86
  PEAK FLOW RATE(CFS) =    4894.24

****************************************************************************
  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  6.38 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  33.34
  BOX-FLOW(CFS) =    4894.24
  BOX-FLOW TRAVEL TIME(MIN.) =   0.33    Tc(MIN.) =   50.84
  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.) =   50.84
  *  25 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        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= 0.39;30M= 0.80;1H= 1.05;3H= 1.79;6H= 2.52;24H= 5.48
  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) = 0.52; 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) =    10044.1
```

```
  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) =    2121.06
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    4916.31
  TOTAL AREA(ACRES) =    10044.1       PEAK FLOW RATE(CFS) =    4916.31

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

****************************************************************************
  FLOW PROCESS FROM NODE  20956.00 TO NODE  20965.00 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) =   460.00   MANNING'S N =  0.014
  GIVEN BOX BASEWIDTH(FEET) =  23.00   GIVEN BOX HEIGHT(FEET) =  10.00
  FLOWDEPTH IN BOX IS  4.90 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  43.61
  BOX-FLOW(CFS) =    4916.31
  BOX-FLOW TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =   51.02
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  20965.00 =   36616.63 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20965.00 TO NODE  20965.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  4
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  PEAK FLOW RATE(CFS) =    4916.31    Tc(MIN.) =   51.02
  AREA-AVERAGED Fm(INCH/HR) =  0.52   Ybar = 0.55
  TOTAL AREA(ACRES) =    10044.1

****************************************************************************
  FLOW PROCESS FROM NODE  20964.00 TO NODE  20965.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   311.00
  ELEVATION DATA: UPSTREAM(FEET) =   1357.00  DOWNSTREAM(FEET) =   1347.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.005
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.970
  SUBAREA Tc 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        2.14      0.75     0.600    56    8.14
  COMMERCIAL                 B        1.60      0.75     0.100    56    6.01
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.386
  SUBAREA RUNOFF(CFS) =     15.76
  TOTAL AREA(ACRES) =      3.74   PEAK FLOW RATE(CFS) =     15.76
```



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

****************************************************************************
  FLOW PROCESS FROM NODE  20965.00 TO NODE  20965.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  4
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.01
  RAINFALL INTENSITY(INCH/HR) =   4.97
  AREA-AVERAGED Fm(INCH/HR) =  0.29
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.39
  EFFECTIVE STREAM AREA(ACRES) =       3.74
  TOTAL STREAM AREA(ACRES) =       3.74
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      15.76

****************************************************************************
  FLOW PROCESS FROM NODE  20970.00 TO NODE  20971.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   482.00
  ELEVATION DATA: UPSTREAM(FEET) =   1394.00  DOWNSTREAM(FEET) =   1386.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.167
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.132
  SUBAREA Tc 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        2.37      0.75     0.100    56    8.17
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      8.65
  TOTAL AREA(ACRES) =      2.37   PEAK FLOW RATE(CFS) =      8.65

  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  20971.00 TO NODE  20972.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1386.00  DOWNSTREAM(FEET) =  1384.00
  FLOW LENGTH(FEET) =   295.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.44
  GIVEN PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.65
  PIPE TRAVEL TIME(MIN.) =   0.90    Tc(MIN.) =    9.07
  LONGEST FLOWPATH FROM NODE  20970.00 TO NODE  20972.00 =     777.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  20972.50 TO NODE  20972.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   517.00
  ELEVATION DATA: UPSTREAM(FEET) =   1389.00  DOWNSTREAM(FEET) =   1384.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.358
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.808
  SUBAREA Tc 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        0.07      0.75     0.850    56   14.87
  COMMERCIAL                 B        3.16      0.75     0.100    56    9.36
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.116
  SUBAREA AREA(ACRES) =    3.23   INITIAL SUBAREA RUNOFF(CFS) =   10.82

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =    9.07
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.880
  SUBAREA AREA(ACRES) =    3.23      SUBAREA RUNOFF(CFS) =   11.03
  EFFECTIVE AREA(ACRES) =      5.60   AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.11
  TOTAL AREA(ACRES) =        5.6       PEAK FLOW RATE(CFS) =      19.14

  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  20972.00 TO NODE  20973.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1384.00  DOWNSTREAM(FEET) =  1374.00
  FLOW LENGTH(FEET) =   320.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  12.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.85
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      19.14
  PIPE TRAVEL TIME(MIN.) =   0.45    Tc(MIN.) =    9.52
  LONGEST FLOWPATH FROM NODE  20970.00 TO NODE  20973.00 =    1097.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20973.50 TO NODE  20973.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   597.00
  ELEVATION DATA: UPSTREAM(FEET) =   1383.00  DOWNSTREAM(FEET) =   1374.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.070
```



```
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.880
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        3.61      0.75     0.100    56    9.07
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    3.61   INITIAL SUBAREA RUNOFF(CFS) =   12.36

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =    9.52
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.769
  SUBAREA AREA(ACRES) =    3.61      SUBAREA RUNOFF(CFS) =   12.00
  EFFECTIVE AREA(ACRES) =      9.21   AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.11
  TOTAL AREA(ACRES) =        9.2       PEAK FLOW RATE(CFS) =      30.59

  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  20973.00 TO NODE  20974.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1374.00  DOWNSTREAM(FEET) =  1368.00
  FLOW LENGTH(FEET) =   313.00   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.74
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      30.59
  PIPE TRAVEL TIME(MIN.) =   0.54    Tc(MIN.) =   10.06
  LONGEST FLOWPATH FROM NODE  20970.00 TO NODE  20974.00 =    1410.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20974.50 TO NODE  20974.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   599.00
  ELEVATION DATA: UPSTREAM(FEET) =   1376.00  DOWNSTREAM(FEET) =   1368.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.305
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.821
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        3.67      0.75     0.100    56    9.30
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    3.67   INITIAL SUBAREA RUNOFF(CFS) =   12.38

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =   10.06
```

```
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.647
 SUBAREA AREA(ACRES) =    3.67      SUBAREA RUNOFF(CFS) =   11.80
 EFFECTIVE AREA(ACRES) =     12.88   AREA-AVERAGED Fm(INCH/HR) =  0.08
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =       12.9       PEAK FLOW RATE(CFS) =      41.38

 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  20974.00 TO NODE  20975.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1368.00  DOWNSTREAM(FEET) =  1364.00
 FLOW LENGTH(FEET) =   237.00   MANNING'S N =  0.013
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) =  13.17
 PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      41.38
 PIPE TRAVEL TIME(MIN.) =   0.30    Tc(MIN.) =   10.36
 LONGEST FLOWPATH FROM NODE  20970.00 TO NODE  20975.00 =    1647.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  20975.50 TO NODE  20975.00 IS CODE =  82
----------------------------------------------------------------------------
 >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
 >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   549.00
 ELEVATION DATA: UPSTREAM(FEET) =   1370.00  DOWNSTREAM(FEET) =   1364.00

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.354
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.809
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 COMMERCIAL                 B        3.48      0.75     0.100    56    9.35
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"       B        0.25      0.75     0.600    56   12.68
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.134
 SUBAREA AREA(ACRES) =    3.73   INITIAL SUBAREA RUNOFF(CFS) =   12.45

 ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
 MAINLINE Tc(MIN.) =   10.36
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.584
 SUBAREA AREA(ACRES) =    3.73      SUBAREA RUNOFF(CFS) =   11.69
 EFFECTIVE AREA(ACRES) =     16.61   AREA-AVERAGED Fm(INCH/HR) =  0.08
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.11
 TOTAL AREA(ACRES) =       16.6       PEAK FLOW RATE(CFS) =      52.33

 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  20975.00 TO NODE  20976.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1364.00  DOWNSTREAM(FEET) =  1358.00
 FLOW LENGTH(FEET) =   338.00   MANNING'S N =  0.013
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) =  16.66
 PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      52.33
 PIPE TRAVEL TIME(MIN.) =   0.34    Tc(MIN.) =   10.69
 LONGEST FLOWPATH FROM NODE  20970.00 TO NODE  20976.00 =    1985.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  20976.50 TO NODE  20976.00 IS CODE =  82
----------------------------------------------------------------------------
 >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
 >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   626.00
 ELEVATION DATA: UPSTREAM(FEET) =   1365.00  DOWNSTREAM(FEET) =   1358.00

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.813
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.701
 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
 "3-4 DWELLINGS/ACRE"       B        0.94      0.75     0.600    56   13.30
 COMMERCIAL                 B        2.21      0.75     0.100    56    9.81
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.249
 SUBAREA AREA(ACRES) =    3.15   INITIAL SUBAREA RUNOFF(CFS) =    9.97

 ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
 MAINLINE Tc(MIN.) =   10.69
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.515
 SUBAREA AREA(ACRES) =    3.15      SUBAREA RUNOFF(CFS) =    9.44
 EFFECTIVE AREA(ACRES) =     19.76   AREA-AVERAGED Fm(INCH/HR) =  0.10
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.13
 TOTAL AREA(ACRES) =       19.8       PEAK FLOW RATE(CFS) =      60.75

 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  20976.00 TO NODE  20965.00 IS CODE =  33
----------------------------------------------------------------------------
 >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
 >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
 UPSTREAM NODE ELEVATION(FEET) =  1358.00
 DOWNSTREAM NODE ELEVATION(FEET) =  1347.00
 FLOW LENGTH(FEET) =   323.00   MANNING'S N =  0.013
```

```
  USER SPECIFIED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  USER SPECIFIED PIPE SYSTEM UNDER PRESSURE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.24
  PIPE-FLOW(CFS) =      38.48
  PIPEFLOW TRAVEL TIME(MIN.) =   0.44    Tc(MIN.) =  11.13
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.431
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.26      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.600
  SUBAREA AREA(ACRES) =     2.26      SUBAREA RUNOFF(CFS) =     6.07
  EFFECTIVE AREA(ACRES) =     22.02    AREA-AVERAGED Fm(INCH/HR) =  0.14
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.18
  TOTAL AREA(ACRES) =       22.0        PEAK FLOW RATE(CFS) =      65.32

  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) =   0.70
  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) =   26.84
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.46
    HALFSTREET FLOOD WIDTH(FEET) =   16.63
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.65
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.13
  LONGEST FLOWPATH FROM NODE  20970.00 TO NODE  20965.00 =    2308.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20965.00 TO NODE  20965.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  4
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.13
  RAINFALL INTENSITY(INCH/HR) =   3.43
  AREA-AVERAGED Fm(INCH/HR) =  0.14
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.18
  EFFECTIVE STREAM AREA(ACRES) =      22.02
  TOTAL STREAM AREA(ACRES) =      22.02
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      65.32

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



```
  FLOW PROCESS FROM NODE  20977.00 TO NODE  20965.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   404.00
  ELEVATION DATA: UPSTREAM(FEET) =   1355.00  DOWNSTREAM(FEET) =   1347.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.347
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.404
  SUBAREA Tc 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        4.50      0.75     0.100    56    7.35
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     17.53
  TOTAL AREA(ACRES) =      4.50   PEAK FLOW RATE(CFS) =     17.53

  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  20965.00 TO NODE  20965.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  4
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  4 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.35
  RAINFALL INTENSITY(INCH/HR) =   4.40
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       4.50
  TOTAL STREAM AREA(ACRES) =       4.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      17.53
  ** CONFLUENCE DATA **
  STREAM      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1      4916.31   51.02    10044.14    20120.00
     2        15.76    6.01        3.74    20964.00
     3        65.32   11.13       22.02    20970.00
     4        17.53    7.35        4.50    20977.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.39;30M= 0.80;1H= 1.05;3H= 1.80;6H= 2.52;24H= 5.48
  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) =    10074.4
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  20965.00 =   36616.63 FEET.
```

```
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0296; Lca/L=0.4,n=.0265; Lca/L=0.5,n=.0243;Lca/L=0.6,n=.0227
  TIME OF PEAK FLOW(HR) = 16.75  RUNOFF VOLUME(AF) =    2132.11
  PEAK FLOW RATE(CFS) =    4939.09

****************************************************************************
  FLOW PROCESS FROM NODE  20965.00 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) =  1347.00  DOWNSTREAM(FEET) =  1335.00
  FLOW LENGTH(FEET) =   466.11   MANNING'S N =  0.014
  GIVEN BOX BASEWIDTH(FEET) =  23.00   GIVEN BOX HEIGHT(FEET) =  10.00
  FLOWDEPTH IN BOX IS  5.33 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  40.30
  BOX-FLOW(CFS) =    4939.09
  BOX-FLOW TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =   51.21
  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 =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  PEAK FLOW RATE(CFS) =    4939.09    Tc(MIN.) =   51.21
  AREA-AVERAGED Fm(INCH/HR) =  0.52   Ybar = 0.55
  TOTAL AREA(ACRES) =    10074.4

****************************************************************************
  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) =   478.00
  ELEVATION DATA: UPSTREAM(FEET) =   1365.00  DOWNSTREAM(FEET) =   1358.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.347
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.079
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        3.00      0.75      0.100    56    8.35
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     10.81
  TOTAL AREA(ACRES) =      3.00   PEAK FLOW RATE(CFS) =     10.81

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.85; 24HR = 5.50

****************************************************************************
  FLOW PROCESS FROM NODE  20961.00 TO NODE  20962.00 IS CODE =  33
----------------------------------------------------------------------------
  >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
```



```
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1358.00
  DOWNSTREAM NODE ELEVATION(FEET) =  1357.00
  FLOW LENGTH(FEET) =   347.00   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  17.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.37
  PIPE-FLOW(CFS) =      10.81
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   1.42    Tc(MIN.) =   9.77
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.711
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        3.09      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) =     3.09      SUBAREA RUNOFF(CFS) =   10.11
  EFFECTIVE AREA(ACRES) =      6.09    AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        6.1        PEAK FLOW RATE(CFS) =      19.93

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.85; 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) =    9.12
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.48
    HALFSTREET FLOOD WIDTH(FEET) =   17.73
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.40
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.67
  LONGEST FLOWPATH FROM NODE  20960.00 TO NODE  20962.00 =     825.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20962.00 TO NODE  20963.00 IS CODE =  33
----------------------------------------------------------------------------
  >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1357.00
  DOWNSTREAM NODE ELEVATION(FEET) =  1353.00
  FLOW LENGTH(FEET) =   353.00   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.) =   8.57
 PIPE-FLOW(CFS) =      19.93
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME(MIN.) =   0.74    Tc(MIN.) =  10.51
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.553
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B        2.86      0.75     0.100    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 =  0.220
 SUBAREA AREA(ACRES) =    3.76      SUBAREA RUNOFF(CFS) =   11.47
 EFFECTIVE AREA(ACRES) =      9.85    AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.15
 TOTAL AREA(ACRES) =        9.9        PEAK FLOW RATE(CFS) =      30.53

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.85; 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) =   10.60
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.41
   HALFSTREET FLOOD WIDTH(FEET) =   14.29
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.45
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.01
 LONGEST FLOWPATH FROM NODE  20960.00 TO NODE  20963.00 =    1178.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  20963.00 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) =  1353.00
 DOWNSTREAM NODE ELEVATION(FEET) =  1335.00
 FLOW LENGTH(FEET) =   742.00   MANNING'S N =  0.013

 USER SPECIFIED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
 DEPTH OF FLOW IN  30.0 INCH PIPE IS  14.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  12.87
 PIPE-FLOW(CFS) =      30.53
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME(MIN.) =   1.02    Tc(MIN.) =  11.53
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.360
 SUBAREA LOSS RATE DATA(AMC  II):
```



```
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B        3.02      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) =    3.02      SUBAREA RUNOFF(CFS) =    8.93
 EFFECTIVE AREA(ACRES) =     12.87    AREA-AVERAGED Fm(INCH/HR) =  0.10
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.13
 TOTAL AREA(ACRES) =       12.9        PEAK FLOW RATE(CFS) =      37.75

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.85; 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) =    7.22
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.34
   HALFSTREET FLOOD WIDTH(FEET) =   10.46
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.98
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.00
 LONGEST FLOWPATH FROM NODE  20960.00 TO NODE  20968.00 =    1920.00 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.) =   11.53
 RAINFALL INTENSITY(INCH/HR) =   3.36
 AREA-AVERAGED Fm(INCH/HR) =  0.10
 AREA-AVERAGED Fp(INCH/HR) =  0.75
 AREA-AVERAGED Ap =  0.13
 EFFECTIVE STREAM AREA(ACRES) =      12.87
 TOTAL STREAM AREA(ACRES) =      12.87
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      37.75
 ** CONFLUENCE DATA **
 STREAM      Q        Tc      AREA      HEADWATER
 NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
    1      4939.09   51.21    10074.40    20120.00
    2        37.75   11.53       12.87    20960.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.39;30M= 0.80;1H= 1.05;3H= 1.80;6H= 2.52;24H= 5.48
 S-GRAPH: VALLEY(DEV.)= 69.1%;VALLEY(UNDEV.)/DESERT= 30.9%
```

```
          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) =    10087.3
  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=.0263; Lca/L=0.5,n=.0242;Lca/L=0.6,n=.0226
  TIME OF PEAK FLOW(HR) = 16.75  RUNOFF VOLUME(AF) =    2137.04
  PEAK FLOW RATE(CFS) =    4948.38

****************************************************************************
  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)     =    10087.3  TC(MIN.) =     51.21
  AREA-AVERAGED Fm(INCH/HR)=  0.52   Ybar =  0.55
  PEAK FLOW RATE(CFS)   =   4948.38
============================================================================
============================================================================
  END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH 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 21070                      *
* 25-YR  HC ULTIMATE CONDITION    APRIL 2014   MCHANDOO                  *
 ************************************************************************

  FILE NAME: LR0210ZZ.DAT
  TIME/DATE OF STUDY: 15:53 04/03/2014
========================================================================
  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) = 1.2500

  *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
  *  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        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
```

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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
  *  25 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
```



```
  *  25 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
  *  25 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
```

```
****************************************************************************
  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
  *  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
  "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
  *  25 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
```

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 ** 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.

****************************************************************************
 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
 *  25 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
 "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
```



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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

****************************************************************************
 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
 *  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
 "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

 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
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--------------------------------------------------------------------------------
  >>>>>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
  *  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
  "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
  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
  *  25 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

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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
 *  25 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

  **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
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.689
 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           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
 *  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
 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
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  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.

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  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
  *  25 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
  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:
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  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
  *  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        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):
  5M = 0.46; 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.

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  FLOW PROCESS FROM NODE  21026.00 TO NODE  21027.00 IS CODE =  63
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  >>>>>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
  *  25 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.

****************************************************************************
  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
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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) =      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
  *  25 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.

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  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
  STREET HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  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) =      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
  *  25 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.

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  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) =     128.19
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.70
    HALFSTREET FLOOD WIDTH(FEET) =   28.14
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    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
  *  25 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<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   23.79
  *  25 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
  *  25 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
  *  25 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 =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   24.16
  *  25 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
  COMMERCIAL                 B        0.11      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        9.57      0.75     0.600    56
  SCHOOL                     B        4.31      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.596
  SUBAREA AREA(ACRES) =   13.99      SUBAREA RUNOFF(CFS) =   21.55
  EFFECTIVE AREA(ACRES) =    211.51   AREA-AVERAGED Fm(INCH/HR) =  0.35
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.46
  TOTAL AREA(ACRES) =      220.8       PEAK FLOW RATE(CFS) =     344.94

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

****************************************************************************
  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  1.85 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  15.54
  BOX-FLOW(CFS) =     344.94
  BOX-FLOW TRAVEL TIME(MIN.) =   0.71    Tc(MIN.) =   24.87
  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 =  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) =     4948.38    Tc(MIN.) =   51.21
  AREA-AVERAGED Fm(INCH/HR) =  0.52    Ybar = 0.55
  TOTAL AREA(ACRES) =    10087.3
  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) =     4948.38    Tc(MIN.) =   51.21
  AREA-AVERAGED Fm(INCH/HR) =  0.52    Ybar = 0.55
  TOTAL AREA(ACRES) =    10087.3
  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  21093.00 IS CODE =  48
----------------------------------------------------------------------------
  >>>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1348.00  DOWNSTREAM(FEET) =  1339.00
  FLOW LENGTH(FEET) =   471.00   MANNING'S N =  0.014
  GIVEN BOX BASEWIDTH(FEET) =  23.00   GIVEN BOX HEIGHT(FEET) =  10.00
  FLOWDEPTH IN BOX IS  5.92 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  36.37
  BOX-FLOW(CFS) =    4948.38
  BOX-FLOW TRAVEL TIME(MIN.) =   0.22    Tc(MIN.) =   51.43
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21093.00 =   37553.74 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21093.00 TO NODE  21093.00 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) =    4948.38    Tc(MIN.) =   51.43
  AREA-AVERAGED Fm(INCH/HR) =  0.52   Ybar = 0.55
  TOTAL AREA(ACRES) =    10087.3

****************************************************************************
  FLOW PROCESS FROM NODE  21090.00 TO NODE  21091.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   594.00
  ELEVATION DATA: UPSTREAM(FEET) =   1349.00  DOWNSTREAM(FEET) =   1338.00
```

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.687
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.985
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                  B        3.24      0.75      0.100    56    8.69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     11.40
  TOTAL AREA(ACRES) =      3.24   PEAK FLOW RATE(CFS) =     11.40

  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  21091.00 TO NODE  21092.00 IS CODE =  33
----------------------------------------------------------------------------
  >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1338.00
  DOWNSTREAM NODE ELEVATION(FEET) =   615.00
  FLOW LENGTH(FEET) =   401.00   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   3.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  46.25
  PIPE-FLOW(CFS) =      11.40
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =   8.84
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.944
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B        4.20      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) =    4.20      SUBAREA RUNOFF(CFS) =   14.63
  EFFECTIVE AREA(ACRES) =      7.44    AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        7.4         PEAK FLOW RATE(CFS) =      25.91

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

  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) =   0.36
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0180
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200
  STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =   14.50
```



```
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.23
    HALFSTREET FLOOD WIDTH(FEET) =    5.13
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   19.02
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.35
  LONGEST FLOWPATH FROM NODE  21090.00 TO NODE  21092.00 =     995.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21092.00 TO NODE  21093.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1340.00  DOWNSTREAM(FEET) =  1339.00
  FLOW LENGTH(FEET) =   215.00   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.25
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      25.91
  PIPE TRAVEL TIME(MIN.) =   0.43    Tc(MIN.) =    9.27
  LONGEST FLOWPATH FROM NODE  21090.00 TO NODE  21093.00 =    1210.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21093.00 TO NODE  21093.00 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.) =    9.27
  RAINFALL INTENSITY(INCH/HR) =   3.83
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       7.44
  TOTAL STREAM AREA(ACRES) =       7.44
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      25.91
  ** CONFLUENCE DATA **
  STREAM      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1      4948.38   51.43    10087.27    20120.00
     2        25.91    9.27        7.44    21090.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.39;30M= 0.80;1H= 1.05;3H= 1.80;6H= 2.52;24H= 5.48
  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) = 0.69; 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) =    10094.7
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21093.00 =   37553.74 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0291; Lca/L=0.4,n=.0261; Lca/L=0.5,n=.0240;Lca/L=0.6,n=.0224
```

```
  TIME OF PEAK FLOW(HR) = 16.75  RUNOFF VOLUME(AF) =    2139.98
  PEAK FLOW RATE(CFS) =    4952.08

****************************************************************************
  FLOW PROCESS FROM NODE  21093.00 TO NODE  21093.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   51.43
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.371
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        9.63      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) =    9.63
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.39;30M= 0.80;1H= 1.05;3H= 1.80;6H= 2.52;24H= 5.48
  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) = 0.69; 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) =    10104.3
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21093.00 =   37553.74 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0291; Lca/L=0.4,n=.0261; Lca/L=0.5,n=.0240;Lca/L=0.6,n=.0224
  TIME OF PEAK FLOW(HR) = 16.75  RUNOFF VOLUME(AF) =    2143.78
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    4959.43
  TOTAL AREA(ACRES) =    10104.3       PEAK FLOW RATE(CFS) =    4959.43

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

****************************************************************************
  FLOW PROCESS FROM NODE  21093.00 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) =  1339.00  DOWNSTREAM(FEET) =  1337.00
  FLOW LENGTH(FEET) =   362.00   MANNING'S N =  0.014
  GIVEN BOX BASEWIDTH(FEET) =  23.00   GIVEN BOX HEIGHT(FEET) =  10.00
  *GIVEN BOX HEIGHT(FEET) =  10.00   ESTIMATED BOX BASEWIDTH(FEET) =   28.50
  ASSUME FULL-FLOWING BOX   BOX-FLOW VELOCITY(FEET/SEC.) =  17.40
  BOX-FLOW(CFS) =    4959.43
  BOX-FLOW TRAVEL TIME(MIN.) =   0.35    Tc(MIN.) =   51.78
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21044.00 =   37915.74 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 **
```



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  PEAK FLOW RATE(CFS) =     4959.43    Tc(MIN.) =   51.78
  AREA-AVERAGED Fm(INCH/HR) =  0.52    Ybar = 0.55
  TOTAL AREA(ACRES) =    10104.3
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21044.00 =   37915.74 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      344.94   24.83    2.122  0.75( 0.35) 0.46     211.5   21020.00
      2      333.46   27.42    2.000  0.75( 0.35) 0.47     220.4   21010.00
      3      332.32   27.57    1.993  0.75( 0.35) 0.47     220.8   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= 0.39;30M= 0.80;1H= 1.05;3H= 1.80;6H= 2.53;24H= 5.48
  S-GRAPH: VALLEY(DEV.)= 69.8%;VALLEY(UNDEV.)/DESERT= 30.2%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.86; LAG(HR) = 0.69; Fm(INCH/HR) = 0.51; Ybar = 0.54
  USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC  II CONDITION.
  DEPTH-AREA FACTORS: 5M = 0.67; 30M = 0.67; 1HR = 0.68;
  3HR = 0.94; 6HR = 0.97; 24HR= 0.98
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =    10325.1
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21044.00 =   37915.74 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) = 16.75  RUNOFF VOLUME(AF) =    2202.67
  PEAK FLOW RATE(CFS) =    5079.44

****************************************************************************
  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  21044.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   51.78
  *  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
  COMMERCIAL                 B        2.03      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.70      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.449
  SUBAREA AREA(ACRES) =    6.73
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.39;30M= 0.80;1H= 1.05;3H= 1.80;6H= 2.53;24H= 5.48
  S-GRAPH: VALLEY(DEV.)= 69.8%;VALLEY(UNDEV.)/DESERT= 30.2%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.86; LAG(HR) = 0.69; Fm(INCH/HR) = 0.51; Ybar = 0.54
  USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC  II CONDITION.
  DEPTH-AREA FACTORS: 5M = 0.67; 30M = 0.67; 1HR = 0.68;
```

```
  3HR = 0.94; 6HR = 0.97; 24HR= 0.98
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =    10331.9
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21044.00 =   37915.74 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) = 16.75  RUNOFF VOLUME(AF) =    2204.59
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    5083.52
  TOTAL AREA(ACRES) =    10331.9       PEAK FLOW RATE(CFS) =    5083.52

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

****************************************************************************
  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) =    5083.52
  FLOW VELOCITY(FEET/SEC.) =  31.44   FLOW DEPTH(FEET) =   5.99
  TRAVEL TIME(MIN.) =   0.73   Tc(MIN.) =   52.51
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21045.00 =   39300.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21045.00 TO NODE  21045.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  21080.00 TO NODE  21081.00 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) =  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.)
  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) =     27.01
  TOTAL AREA(ACRES) =      8.79   PEAK FLOW RATE(CFS) =     27.01
```



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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

****************************************************************************
  FLOW PROCESS FROM NODE  21081.00 TO NODE  21082.00 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) =      32.87
    ***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.) =    2.31
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.52
  STREET FLOW TRAVEL TIME(MIN.) =   2.03   Tc(MIN.) =   12.15
  *  25 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
  "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) =   11.71
  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) =      35.74

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

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.68   HALFSTREET FLOOD WIDTH(FEET) =  26.86
  FLOW VELOCITY(FEET/SEC.) =  2.36   DEPTH*VELOCITY(FT*FT/SEC.) =   1.60
  *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  21082.00
  LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21082.00 =    1215.82 FEET.
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****************************************************************************
  FLOW PROCESS FROM NODE  21082.00 TO NODE  21083.00 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) =      40.44
    ***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.) =    1.61
  STREET FLOW TRAVEL TIME(MIN.) =   1.45   Tc(MIN.) =   13.60
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.046
  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) =    9.40
  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) =      42.63

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

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.75   HALFSTREET FLOOD WIDTH(FEET) =  30.52
  FLOW VELOCITY(FEET/SEC.) =  2.20   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  21083.00
  LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21083.00 =    1404.92 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21083.00 TO NODE  21084.00 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) =      46.91
    ***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.) =   1.52   Tc(MIN.) =   15.12
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.858
  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) =    8.56
  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) =      48.36

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

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.79   HALFSTREET FLOOD WIDTH(FEET) =  32.48
  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  21084.00
  LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21084.00 =    1606.51 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21084.00 TO NODE  21087.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =  1358.00  DOWNSTREAM(FEET) =  1356.50
  FLOW LENGTH(FEET) =   750.64   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.03
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      48.36
  PIPE TRAVEL TIME(MIN.) =   2.49    Tc(MIN.) =   17.61
  LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21087.00 =    2357.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21087.00 TO NODE  21087.00 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.) =   17.61
  RAINFALL INTENSITY(INCH/HR) =   2.61
  AREA-AVERAGED Fm(INCH/HR) =  0.22
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.30
  EFFECTIVE STREAM AREA(ACRES) =      20.39
  TOTAL STREAM AREA(ACRES) =      20.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      48.36

****************************************************************************
  FLOW PROCESS FROM NODE  21085.00 TO NODE  21084.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   560.00
  ELEVATION DATA: UPSTREAM(FEET) =   1358.50  DOWNSTREAM(FEET) =   1358.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   15.559
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.809
  SUBAREA Tc 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        0.14      0.98     0.500    32   19.91
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        1.29      0.75     0.500    56   19.91
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.85      0.75     0.600    56   21.09
  COMMERCIAL                 B        1.55      0.75     0.100    56   15.56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.76
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.360
  SUBAREA RUNOFF(CFS) =      8.74
  TOTAL AREA(ACRES) =      3.83   PEAK FLOW RATE(CFS) =      8.74

  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  21085.00 TO NODE  21086.00 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) =      13.43
    ***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.) =    1.53
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.83
  STREET FLOW TRAVEL TIME(MIN.) =   2.27   Tc(MIN.) =   17.83
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.589
  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) =    9.36
  EFFECTIVE AREA(ACRES) =      8.20    AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.79  AREA-AVERAGED Ap =  0.30
  TOTAL AREA(ACRES) =        8.2        PEAK FLOW RATE(CFS) =      17.35

  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) = 0.58   HALFSTREET FLOOD WIDTH(FEET) =  22.04
  FLOW VELOCITY(FEET/SEC.) =  1.66   DEPTH*VELOCITY(FT*FT/SEC.) =   0.96
  *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  21086.00
  LONGEST FLOWPATH FROM NODE  21085.00 TO NODE  21086.00 =     767.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21086.00 TO NODE  21087.00 IS CODE =  63
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
```

```
================================================================================
  UPSTREAM ELEVATION(FEET) = 1357.00  DOWNSTREAM ELEVATION(FEET) = 1356.50
  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) =      23.38
    ***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.) =    1.52
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.03
  STREET FLOW TRAVEL TIME(MIN.) =   3.76   Tc(MIN.) =   21.58
  *  25 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
  "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) =   12.05
  EFFECTIVE AREA(ACRES) =     14.61    AREA-AVERAGED Fm(INCH/HR) =  0.23
  AREA-AVERAGED Fp(INCH/HR) =  0.83  AREA-AVERAGED Ap =  0.28
  TOTAL AREA(ACRES) =       14.6        PEAK FLOW RATE(CFS) =      27.32

  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) = 0.72   HALFSTREET FLOOD WIDTH(FEET) =  28.75
  FLOW VELOCITY(FEET/SEC.) =  1.58   DEPTH*VELOCITY(FT*FT/SEC.) =   1.13
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  341.5 FT WITH ELEVATION-DROP =   0.5 FT, IS   18.1 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE  21087.00
  LONGEST FLOWPATH FROM NODE  21085.00 TO NODE  21087.00 =    1109.05 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21087.00 TO NODE  21087.00 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.) =   21.58
  RAINFALL INTENSITY(INCH/HR) =   2.31
  AREA-AVERAGED Fm(INCH/HR) =  0.23
  AREA-AVERAGED Fp(INCH/HR) =  0.83
  AREA-AVERAGED Ap =  0.28
  EFFECTIVE STREAM AREA(ACRES) =      14.61
  TOTAL STREAM AREA(ACRES) =      14.61
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      27.32

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       48.36   17.61    2.608  0.75( 0.22) 0.30      20.4   21080.00
      2       27.32   21.58    2.308  0.83( 0.23) 0.28      14.6   21085.00

  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       73.86   17.61    2.608  0.78( 0.23) 0.29      32.3   21080.00
      2       69.60   21.58    2.308  0.78( 0.23) 0.29      35.0   21085.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      73.86    Tc(MIN.) =    17.61
  EFFECTIVE AREA(ACRES) =      32.31   AREA-AVERAGED Fm(INCH/HR) =  0.23
  AREA-AVERAGED Fp(INCH/HR) =  0.78  AREA-AVERAGED Ap =  0.29
  TOTAL AREA(ACRES) =       35.0
  LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21087.00 =    2357.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21087.00 TO NODE  21088.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1356.00  DOWNSTREAM(FEET) =  1336.00
  FLOW LENGTH(FEET) =  1357.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  22.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.52
  GIVEN PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      73.86
  PIPE TRAVEL TIME(MIN.) =   1.81    Tc(MIN.) =   19.42
  LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21088.00 =    3714.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21088.50 TO NODE  21088.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =  1495.00
  ELEVATION DATA: UPSTREAM(FEET) =   1354.00  DOWNSTREAM(FEET) =   1336.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.696
```

```
 *  25 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.)
 RESIDENTIAL
 "3-4 DWELLINGS/ACRE"        A        3.91      0.98     0.600    32   18.56
 COMMERCIAL                  A        7.31      0.98     0.100    32   13.70
 COMMERCIAL                  B        7.68      0.75     0.100    56   13.70
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"        A        1.19      0.98     0.500    32   17.53
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.94
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.221
 SUBAREA AREA(ACRES) =   20.09   INITIAL SUBAREA RUNOFF(CFS) =   51.10

 ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
 MAINLINE Tc(MIN.) =   19.42
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.460
 SUBAREA AREA(ACRES) =   20.09      SUBAREA RUNOFF(CFS) =   40.74
 EFFECTIVE AREA(ACRES) =     52.40   AREA-AVERAGED Fm(INCH/HR) =  0.22
 AREA-AVERAGED Fp(INCH/HR) =  0.83  AREA-AVERAGED Ap =  0.26
 TOTAL AREA(ACRES) =       55.1       PEAK FLOW RATE(CFS) =     105.70

 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  21088.00 TO NODE  21096.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1336.00  DOWNSTREAM(FEET) =  1335.00
 FLOW LENGTH(FEET) =   413.00   MANNING'S N =  0.014
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.65
 PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
 GIVEN PIPE DIAMETER(INCH) =  54.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     105.70
 PIPE TRAVEL TIME(MIN.) =   1.04    Tc(MIN.) =   20.45
 LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21096.00 =    4127.15 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  21096.00 TO NODE  21096.00 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.) =   20.45
 RAINFALL INTENSITY(INCH/HR) =   2.38
 AREA-AVERAGED Fm(INCH/HR) =  0.22
 AREA-AVERAGED Fp(INCH/HR) =  0.83
 AREA-AVERAGED Ap =  0.26
 EFFECTIVE STREAM AREA(ACRES) =      52.40
 TOTAL STREAM AREA(ACRES) =      55.09
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     105.70

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



```
 FLOW PROCESS FROM NODE  21094.00 TO NODE  21095.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   542.00
 ELEVATION DATA: UPSTREAM(FEET) =   1354.00  DOWNSTREAM(FEET) =   1350.00

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.066
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.648
 SUBAREA Tc 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                  A        3.86      0.98     0.100    32   10.07
 COMMERCIAL                  B        1.36      0.75     0.100    56   10.07
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.92
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =     16.71
 TOTAL AREA(ACRES) =      5.22   PEAK FLOW RATE(CFS) =     16.71

 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  21095.00 TO NODE  21096.00 IS CODE =  33
----------------------------------------------------------------------------
 >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
 >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
 UPSTREAM NODE ELEVATION(FEET) =  1350.00
 DOWNSTREAM NODE ELEVATION(FEET) =  1335.00
 FLOW LENGTH(FEET) =   850.00   MANNING'S N =  0.014

 USER SPECIFIED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
 DEPTH OF FLOW IN  30.0 INCH PIPE IS  11.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   9.25
 PIPE-FLOW(CFS) =      16.71
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME(MIN.) =   1.63    Tc(MIN.) =  11.69
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.335
 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"        A        3.79      0.98     0.500    32
 COMMERCIAL                  B        1.00      0.75     0.100    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.96
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.416
 SUBAREA AREA(ACRES) =    4.79      SUBAREA RUNOFF(CFS) =   12.65
 EFFECTIVE AREA(ACRES) =     10.01    AREA-AVERAGED Fm(INCH/HR) =  0.24
 AREA-AVERAGED Fp(INCH/HR) =  0.95  AREA-AVERAGED Ap =  0.25
 TOTAL AREA(ACRES) =       10.0        PEAK FLOW RATE(CFS) =      27.88

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.94; 6HR = 2.56; 24HR = 4.77

 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) =   11.17
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.39
    HALFSTREET FLOOD WIDTH(FEET) =   13.35
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.94
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.16
  LONGEST FLOWPATH FROM NODE  21094.00 TO NODE  21096.00 =    1392.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21096.00 TO NODE  21096.00 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.) =   11.69
  RAINFALL INTENSITY(INCH/HR) =   3.33
  AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.95
  AREA-AVERAGED Ap =  0.25
  EFFECTIVE STREAM AREA(ACRES) =      10.01
  TOTAL STREAM AREA(ACRES) =      10.01
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      27.88

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1      105.70   20.45    2.384  0.83( 0.22) 0.26      52.4   21080.00
      1       98.13   24.53    2.138  0.83( 0.22) 0.26      55.1   21085.00
      2       27.88   11.69    3.335  0.95( 0.24) 0.25      10.0   21094.00

  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      114.83   11.69    3.335  0.86( 0.22) 0.26      40.0   21094.00
      2      125.02   20.45    2.384  0.85( 0.22) 0.26      62.4   21080.00
      3      115.23   24.53    2.138  0.85( 0.22) 0.26      65.1   21085.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     125.02    Tc(MIN.) =    20.45
  EFFECTIVE AREA(ACRES) =      62.41   AREA-AVERAGED Fm(INCH/HR) =  0.22
  AREA-AVERAGED Fp(INCH/HR) =  0.85  AREA-AVERAGED Ap =  0.26
  TOTAL AREA(ACRES) =       65.1
  LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21096.00 =    4127.15 FEET.
```



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****************************************************************************
  FLOW PROCESS FROM NODE  21096.00 TO NODE  21097.00 IS CODE =  33
----------------------------------------------------------------------------
  >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1335.00
  DOWNSTREAM NODE ELEVATION(FEET) =  1317.00
  FLOW LENGTH(FEET) =  1424.00   MANNING'S N =  0.014

  USER SPECIFIED PIPE DIAMETER(INCH) =  60.00    NUMBER OF PIPES =   1
  DEPTH OF FLOW IN  60.0 INCH PIPE IS  28.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.56
  PIPE-FLOW(CFS) =     125.02
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   1.86    Tc(MIN.) =  22.31
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.263
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B       23.81      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"        B       12.27      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.270
  SUBAREA AREA(ACRES) =   36.08      SUBAREA RUNOFF(CFS) =   66.93
  EFFECTIVE AREA(ACRES) =     98.49    AREA-AVERAGED Fm(INCH/HR) =  0.21
  AREA-AVERAGED Fp(INCH/HR) =  0.81  AREA-AVERAGED Ap =  0.26
  TOTAL AREA(ACRES) =      101.2        PEAK FLOW RATE(CFS) =     181.57

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.94; 6HR = 2.56; 24HR = 4.77

  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) =   56.55
    ***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.) =    4.22
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.72
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  1424.0 FT WITH ELEVATION-DROP =  18.0 FT, IS   93.7 CFS,
         WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE  21097.00

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```

```
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1      193.91   13.59    3.047  0.80( 0.21) 0.27      76.0   21094.00
    2      181.57   22.31    2.263  0.81( 0.21) 0.26      98.5   21080.00
    3      166.57   26.43    2.044  0.81( 0.22) 0.27     101.2   21085.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     193.91  Tc(MIN.) =   13.59
  AREA-AVERAGED Fm(INCH/HR) =  0.21  AREA-AVERAGED Fp(INCH/HR) =  0.80
  AREA-AVERAGED Ap =  0.27  EFFECTIVE AREA(ACRES) =      76.05
  LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21097.00 =    5551.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21097.00 TO NODE  21045.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1317.00  DOWNSTREAM(FEET) =  1295.00
  FLOW LENGTH(FEET) =   885.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  66.0 INCH PIPE IS  28.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.37
  GIVEN PIPE DIAMETER(INCH) =  66.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     193.91
  PIPE TRAVEL TIME(MIN.) =   0.76    Tc(MIN.) =   14.35
  LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21045.00 =    6436.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21045.50 TO NODE  21045.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =  1687.00
  ELEVATION DATA: UPSTREAM(FEET) =   1340.00  DOWNSTREAM(FEET) =   1295.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.260
  *  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
  "3-4 DWELLINGS/ACRE"       B        6.36      0.75     0.600    56   16.62
  COMMERCIAL                 B       19.28      0.75     0.100    56   12.26
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.224
  SUBAREA AREA(ACRES) =   25.64   INITIAL SUBAREA RUNOFF(CFS) =   70.93

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =   14.35
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.949
  SUBAREA AREA(ACRES) =   25.64      SUBAREA RUNOFF(CFS) =   64.18
  EFFECTIVE AREA(ACRES) =    101.69   AREA-AVERAGED Fm(INCH/HR) =  0.26
  AREA-AVERAGED Fp(INCH/HR) =  0.80  AREA-AVERAGED Ap =  0.32
  TOTAL AREA(ACRES) =      126.8       PEAK FLOW RATE(CFS) =     246.40

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.94; 6HR = 2.56; 24HR = 4.77
```



```
  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      251.37   14.35    2.949  0.79( 0.20) 0.25     101.7   21094.00
      2      224.80   23.09    2.217  0.80( 0.20) 0.26     124.1   21080.00
      3      205.77   27.22    2.008  0.80( 0.21) 0.26     126.8   21085.00
  NEW PEAK FLOW DATA ARE:
  PEAK FLOW RATE(CFS) =     251.37  Tc(MIN.) =   14.35
  AREA-AVERAGED Fm(INCH/HR) =  0.20  AREA-AVERAGED Fp(INCH/HR) =  0.79
  AREA-AVERAGED Ap =  0.25  EFFECTIVE AREA(ACRES) =     101.69

****************************************************************************
  FLOW PROCESS FROM NODE  21045.00 TO NODE  21045.00 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      251.37   14.35    2.949  0.79( 0.20) 0.25     101.7   21094.00
      2      224.80   23.09    2.217  0.80( 0.20) 0.26     124.1   21080.00
      3      205.77   27.22    2.008  0.80( 0.21) 0.26     126.8   21085.00
  LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21045.00 =    6436.15 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  PEAK FLOW RATE(CFS) =     5083.52    Tc(MIN.) =   52.51
  AREA-AVERAGED Fm(INCH/HR) =  0.51    Ybar = 0.54
  TOTAL AREA(ACRES) =    10331.9
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21045.00 =   39300.79 FEET.

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.39;30M= 0.80;1H= 1.06;3H= 1.80;6H= 2.53;24H= 5.47
  S-GRAPH: VALLEY(DEV.)= 70.2%;VALLEY(UNDEV.)/DESERT= 29.8%
           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) =    10458.7
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21045.00 =   39300.79 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) = 16.75  RUNOFF VOLUME(AF) =    2244.73
  PEAK FLOW RATE(CFS) =    5142.81

****************************************************************************
  FLOW PROCESS FROM NODE  21045.00 TO NODE  21045.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   52.51
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.354
  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       20.17      0.98     0.500    32
COMMERCIAL                 A        5.87      0.98     0.100    32
COMMERCIAL                 B        0.05      0.75     0.100    56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.409
SUBAREA AREA(ACRES) =   26.09
UNIT-HYDROGRAPH DATA:
RAINFALL(INCH): 5M= 0.39;30M= 0.80;1H= 1.06;3H= 1.80;6H= 2.53;24H= 5.47
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) =    10484.8
LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21045.00 =   39300.79 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) = 16.75  RUNOFF VOLUME(AF) =    2251.46
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    5157.46
TOTAL AREA(ACRES) =    10484.8       PEAK FLOW RATE(CFS) =    5157.46

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  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) =    5157.46
FLOW VELOCITY(FEET/SEC.) =  31.43   FLOW DEPTH(FEET) =   6.05
TRAVEL TIME(MIN.) =   1.46   Tc(MIN.) =   53.96
LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21046.00 =   42045.56 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  21046.00 TO NODE  21046.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
MAINLINE Tc(MIN.) =   53.96
*  25 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
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= 0.39;30M= 0.80;1H= 1.06;3H= 1.80;6H= 2.53;24H= 5.47
S-GRAPH: VALLEY(DEV.)= 70.5%;VALLEY(UNDEV.)/DESERT= 29.5%
         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) =    10567.2
LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21046.00 =   42045.56 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) = 16.75  RUNOFF VOLUME(AF) =    2278.43
UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    5133.02
TOTAL AREA(ACRES) =    10567.2       PEAK FLOW RATE(CFS) =    5157.46
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 = 5.47

****************************************************************************
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) =    5157.46
FLOW VELOCITY(FEET/SEC.) =  28.45   FLOW DEPTH(FEET) =   6.03
TRAVEL TIME(MIN.) =   1.59   Tc(MIN.) =   55.56
LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21069.00 =   44763.59 FEET.

****************************************************************************
FLOW PROCESS FROM NODE  21069.00 TO NODE  21069.00 IS CODE =  81
----------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
MAINLINE Tc(MIN.) =   55.56
*  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.309
SUBAREA LOSS RATE DATA(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
```

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  SUBAREA AREA(ACRES) =   46.47
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.39;30M= 0.80;1H= 1.06;3H= 1.80;6H= 2.53;24H= 5.47
  S-GRAPH: VALLEY(DEV.)= 70.6%;VALLEY(UNDEV.)/DESERT= 29.4%
           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) =    10613.7
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21069.00 =   44763.59 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) = 16.75  RUNOFF VOLUME(AF) =    2291.81
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    5037.04
  TOTAL AREA(ACRES) =    10613.7       PEAK FLOW RATE(CFS) =    5157.46
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 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
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.396
  *  25 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
----------------------------------------------------------------------------
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  >>>>>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
  *  25 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)<<<<<
============================================================================
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  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
  *  25 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

  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.

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  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
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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) =     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
*  25 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
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) =  30.00    NUMBER OF PIPES =   1
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY(FEET/SEC.) =   8.14
PIPE-FLOW(CFS) =      40.00
PIPEFLOW TRAVEL TIME(MIN.) =   2.93    Tc(MIN.) =  16.49
*  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.713
SUBAREA AREA(ACRES) =   45.56      SUBAREA RUNOFF(CFS) =   98.97
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  TOTAL AREA(ACRES) =       84.9        PEAK FLOW RATE(CFS) =     187.47

  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) =  147.47
    ***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.) =    5.13
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.56
  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.) =   16.49
  RAINFALL INTENSITY(INCH/HR) =   2.71
  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 =     187.47

****************************************************************************
  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) =  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
```



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****************************************************************************
  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
  *  25 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
----------------------------------------------------------------------------
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  >>>>>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
  *  25 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
  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
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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) =   0.91

    **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
  *  25 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
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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) =   1.03

    **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
  *  25 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***
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    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
  *  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
  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
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.738
  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        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
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      187.47   16.49    2.713  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      249.56   16.49    2.713  0.94( 0.26) 0.27     112.3   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) =     249.56    Tc(MIN.) =    16.49
EFFECTIVE AREA(ACRES) =     112.34   AREA-AVERAGED Fm(INCH/HR) =  0.26
AREA-AVERAGED Fp(INCH/HR) =  0.94  AREA-AVERAGED Ap =  0.27
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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  62.7 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =   8.10
PIPE-FLOW(CFS) =     249.56
*NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
PIPEFLOW TRAVEL TIME(MIN.) =   2.99    Tc(MIN.) =  19.48
*  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.455
SUBAREA LOSS RATE 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) =  143.12
EFFECTIVE AREA(ACRES) =    181.67    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) =     365.26

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) =  115.70
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  1.10
  HALFSTREET FLOOD WIDTH(FEET) =   60.91
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.17
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.39
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 *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      365.26   19.48    2.455  0.91( 0.22) 0.24     181.7   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) =     365.26  Tc(MIN.) =   19.48
 AREA-AVERAGED Fm(INCH/HR) =  0.22  AREA-AVERAGED Fp(INCH/HR) =  0.91
 AREA-AVERAGED Ap =  0.24  EFFECTIVE AREA(ACRES) =     181.67
 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.) =  21.98
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.283
 SUBAREA LOSS RATE DATA(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) =   67.15
 EFFECTIVE AREA(ACRES) =    216.01    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) =     397.52

 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
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 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =   36.66
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.79
  HALFSTREET FLOOD WIDTH(FEET) =   37.81
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.73
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.37
 *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      404.36   21.98    2.283  0.92( 0.20) 0.22     216.0   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) =     404.36  Tc(MIN.) =   21.98
 AREA-AVERAGED Fm(INCH/HR) =  0.20  AREA-AVERAGED Fp(INCH/HR) =  0.92
 AREA-AVERAGED Ap =  0.22  EFFECTIVE AREA(ACRES) =     216.01
 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      404.36   21.98    2.283  0.92( 0.20) 0.22     216.0   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) =     5157.46    Tc(MIN.) =   55.56
 AREA-AVERAGED Fm(INCH/HR) =  0.51    Ybar = 0.54
 TOTAL AREA(ACRES) =    10613.7
 LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21069.00 =   44763.59 FEET.

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.39;30M= 0.81;1H= 1.06;3H= 1.81;6H= 2.53;24H= 5.45
 S-GRAPH: VALLEY(DEV.)= 71.3%;VALLEY(UNDEV.)/DESERT= 28.7%
          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 = 0.67; 1HR = 0.67;
 3HR = 0.94; 6HR = 0.97; 24HR= 0.98
 UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =    10859.9
 LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21069.00 =   44763.59 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) = 16.75  RUNOFF VOLUME(AF) =    2364.14
 PEAK FLOW RATE(CFS) =    5182.70

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

```
  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) =    5182.70
  FLOW VELOCITY(FEET/SEC.) =  27.32   FLOW DEPTH(FEET) =   6.23
  TRAVEL TIME(MIN.) =   1.71   Tc(MIN.) =   57.26
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21070.00 =   47559.06 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21070.00 TO NODE  21070.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   57.26
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  1.286
  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= 0.39;30M= 0.81;1H= 1.06;3H= 1.81;6H= 2.53;24H= 5.44
  S-GRAPH: VALLEY(DEV.)= 71.6%;VALLEY(UNDEV.)/DESERT= 28.4%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.95; LAG(HR) = 0.76; 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) =    10990.4
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21070.00 =   47559.06 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0263; Lca/L=0.4,n=.0236; Lca/L=0.5,n=.0217;Lca/L=0.6,n=.0202
  TIME OF PEAK FLOW(HR) = 16.83  RUNOFF VOLUME(AF) =    2406.08
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    5204.77
  TOTAL AREA(ACRES) =    10990.4       PEAK FLOW RATE(CFS) =    5204.77

  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)     =    10990.4  TC(MIN.) =     57.26
  AREA-AVERAGED Fm(INCH/HR)=  0.50   Ybar =  0.53
  PEAK FLOW RATE(CFS)   =   5204.77
============================================================================
============================================================================
  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 20968                      *
* 10-YR  HC ULTIMATE CONDITION    APRIL 2014   MCHANDOO                  *
 ************************************************************************

  FILE NAME: LR0209ZZ.DAT
  TIME/DATE OF STUDY: 16:50 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) = 1.2490

  *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
  *  10 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
```

```
 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
 *  10 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
```



```
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(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
 *  10 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
 *  10 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
```



```
   **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
 *  10 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***
```

```
    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
  *  10 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
```



```
  STREET FLOW TRAVEL TIME(MIN.) =   2.80   Tc(MIN.) =   21.24
  *  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
  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
  *  10 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
  *  10 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
```



```
  *  10 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
  *  10 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
  *  10 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<<<<<
============================================================================
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```
  MAINLINE Tc(MIN.) =   19.58
  *  10 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
  *  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        1.86      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
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  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
  *  10 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
  *  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       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
  *  10 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
  *  10 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
  *  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
  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
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  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
  *  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
  "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
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.213
  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) =   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
```

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 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
 *  10 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
 *  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
 "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
 *  10 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
  *  10 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
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    **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
  *  10 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
  *  10 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
  *  10 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
  *  10 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
  *  10 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
  *  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
  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
  *  10 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
  *  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
  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) =     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) =     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= 0.34;30M= 0.70;1H= 0.91;3H= 1.54;6H= 2.14;24H= 4.33
  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 = 0.56
  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) =     672.16
  PEAK FLOW RATE(CFS) =    2282.41

******************************************************************************
  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  5.00 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  28.53
  BOX-FLOW(CFS) =    2282.41
  BOX-FLOW TRAVEL TIME(MIN.) =   0.36    Tc(MIN.) =   46.56
  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) =    2282.41    Tc(MIN.) =   46.56
  AREA-AVERAGED Fm(INCH/HR) =  0.48   Ybar = 0.56
  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) =  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
  *  10 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
  *  10 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
  *  10 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
  *  10 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
  COMMERCIAL                 B        3.97      0.75     0.100    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
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.411
  SUBAREA AREA(ACRES) =   13.38      SUBAREA RUNOFF(CFS) =   32.65
  EFFECTIVE AREA(ACRES) =     28.78   AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.40
```



```
  TOTAL AREA(ACRES) =       28.8       PEAK FLOW RATE(CFS) =      70.40

  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  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) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.40
  EFFECTIVE STREAM AREA(ACRES) =      28.78
  TOTAL STREAM AREA(ACRES) =      28.78
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      70.40
  ** CONFLUENCE DATA **
  STREAM      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1      2282.41   46.56     3993.76    20620.00
     2        70.40   13.78       28.78    20950.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.34;30M= 0.70;1H= 0.91;3H= 1.54;6H= 2.15;24H= 4.34
  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 = 0.56
  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) =     4022.5
  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) =     680.02
  PEAK FLOW RATE(CFS) =    2293.97

****************************************************************************
  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) =     2293.97    Tc(MIN.) =   46.56
  AREA-AVERAGED Fm(INCH/HR) =  0.48    Ybar = 0.56
  TOTAL AREA(ACRES) =     4022.5
  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= 0.32;30M= 0.65;1H= 0.85;3H= 1.49;6H= 2.13;24H= 4.40
  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 = 0.60
  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) =    10020.8
  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) =    1521.36
  PEAK FLOW RATE(CFS) =    3591.45

****************************************************************************
  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  5.15 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  30.30
  BOX-FLOW(CFS) =    3591.45
  BOX-FLOW TRAVEL TIME(MIN.) =   0.37    Tc(MIN.) =   54.82
  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.) =   54.82
  *  10 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
  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= 0.32;30M= 0.65;1H= 0.86;3H= 1.49;6H= 2.13;24H= 4.40
  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) =    10044.1
```

```
 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) =    1529.05
 UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    3585.78
 TOTAL AREA(ACRES) =    10044.1       PEAK FLOW RATE(CFS) =    3591.45
 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  20965.00 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) =   460.00   MANNING'S N =  0.014
 GIVEN BOX BASEWIDTH(FEET) =  23.00   GIVEN BOX HEIGHT(FEET) =  10.00
 FLOWDEPTH IN BOX IS  3.96 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  39.41
 BOX-FLOW(CFS) =    3591.45
 BOX-FLOW TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =   55.01
 LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  20965.00 =   36616.63 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  20965.00 TO NODE  20965.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  4
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 PEAK FLOW RATE(CFS) =    3591.45    Tc(MIN.) =   55.01
 AREA-AVERAGED Fm(INCH/HR) =  0.52   Ybar = 0.60
 TOTAL AREA(ACRES) =    10044.1

****************************************************************************
 FLOW PROCESS FROM NODE  20964.00 TO NODE  20965.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   311.00
 ELEVATION DATA: UPSTREAM(FEET) =   1357.00  DOWNSTREAM(FEET) =   1347.00

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.005
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  4.970
 SUBAREA Tc 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        2.14      0.75     0.600    56    8.14
 COMMERCIAL                 B        1.60      0.75     0.100    56    6.01
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.386
 SUBAREA RUNOFF(CFS) =     15.76
 TOTAL AREA(ACRES) =      3.74   PEAK FLOW RATE(CFS) =     15.76
```



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

****************************************************************************
 FLOW PROCESS FROM NODE  20965.00 TO NODE  20965.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  4
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    6.01
 RAINFALL INTENSITY(INCH/HR) =   4.97
 AREA-AVERAGED Fm(INCH/HR) =  0.29
 AREA-AVERAGED Fp(INCH/HR) =  0.75
 AREA-AVERAGED Ap =  0.39
 EFFECTIVE STREAM AREA(ACRES) =       3.74
 TOTAL STREAM AREA(ACRES) =       3.74
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      15.76

****************************************************************************
 FLOW PROCESS FROM NODE  20970.00 TO NODE  20971.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   482.00
 ELEVATION DATA: UPSTREAM(FEET) =   1394.00  DOWNSTREAM(FEET) =   1386.00

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.167
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  4.132
 SUBAREA Tc 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        2.37      0.75     0.100    56    8.17
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =      8.65
 TOTAL AREA(ACRES) =      2.37   PEAK FLOW RATE(CFS) =      8.65

 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  20971.00 TO NODE  20972.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1386.00  DOWNSTREAM(FEET) =  1384.00
 FLOW LENGTH(FEET) =   295.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.44
 GIVEN PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       8.65
 PIPE TRAVEL TIME(MIN.) =   0.90    Tc(MIN.) =    9.07
 LONGEST FLOWPATH FROM NODE  20970.00 TO NODE  20972.00 =     777.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE  20972.50 TO NODE  20972.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   517.00
  ELEVATION DATA: UPSTREAM(FEET) =   1389.00  DOWNSTREAM(FEET) =   1384.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.358
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.808
  SUBAREA Tc 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        0.07      0.75     0.850    56   14.87
  COMMERCIAL                B        3.16      0.75     0.100    56    9.36
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.116
  SUBAREA AREA(ACRES) =    3.23   INITIAL SUBAREA RUNOFF(CFS) =   10.82

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =    9.07
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.880
  SUBAREA AREA(ACRES) =    3.23      SUBAREA RUNOFF(CFS) =   11.03
  EFFECTIVE AREA(ACRES) =      5.60   AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.11
  TOTAL AREA(ACRES) =        5.6       PEAK FLOW RATE(CFS) =      19.14

  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  20972.00 TO NODE  20973.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1384.00  DOWNSTREAM(FEET) =  1374.00
  FLOW LENGTH(FEET) =   320.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  12.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.85
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      19.14
  PIPE TRAVEL TIME(MIN.) =   0.45    Tc(MIN.) =    9.52
  LONGEST FLOWPATH FROM NODE  20970.00 TO NODE  20973.00 =    1097.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20973.50 TO NODE  20973.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   597.00
  ELEVATION DATA: UPSTREAM(FEET) =   1383.00  DOWNSTREAM(FEET) =   1374.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
```



```
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.070
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.880
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                B        3.61      0.75     0.100    56    9.07
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    3.61   INITIAL SUBAREA RUNOFF(CFS) =   12.36

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =    9.52
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.769
  SUBAREA AREA(ACRES) =    3.61      SUBAREA RUNOFF(CFS) =   12.00
  EFFECTIVE AREA(ACRES) =      9.21   AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.11
  TOTAL AREA(ACRES) =        9.2       PEAK FLOW RATE(CFS) =      30.59

  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  20973.00 TO NODE  20974.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1374.00  DOWNSTREAM(FEET) =  1368.00
  FLOW LENGTH(FEET) =   313.00   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.74
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      30.59
  PIPE TRAVEL TIME(MIN.) =   0.54    Tc(MIN.) =   10.06
  LONGEST FLOWPATH FROM NODE  20970.00 TO NODE  20974.00 =    1410.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20974.50 TO NODE  20974.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   599.00
  ELEVATION DATA: UPSTREAM(FEET) =   1376.00  DOWNSTREAM(FEET) =   1368.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.305
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.821
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                B        3.67      0.75     0.100    56    9.30
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    3.67   INITIAL SUBAREA RUNOFF(CFS) =   12.38

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
```

```
  MAINLINE Tc(MIN.) =   10.06
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.647
  SUBAREA AREA(ACRES) =    3.67      SUBAREA RUNOFF(CFS) =   11.80
  EFFECTIVE AREA(ACRES) =     12.88   AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       12.9       PEAK FLOW RATE(CFS) =      41.38

  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  20974.00 TO NODE  20975.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1368.00  DOWNSTREAM(FEET) =  1364.00
  FLOW LENGTH(FEET) =   237.00   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.17
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      41.38
  PIPE TRAVEL TIME(MIN.) =   0.30    Tc(MIN.) =   10.36
  LONGEST FLOWPATH FROM NODE  20970.00 TO NODE  20975.00 =    1647.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20975.50 TO NODE  20975.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   549.00
  ELEVATION DATA: UPSTREAM(FEET) =   1370.00  DOWNSTREAM(FEET) =   1364.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.354
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.809
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        3.48      0.75     0.100    56    9.35
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.25      0.75     0.600    56   12.68
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.134
  SUBAREA AREA(ACRES) =    3.73   INITIAL SUBAREA RUNOFF(CFS) =   12.45

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =   10.36
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.584
  SUBAREA AREA(ACRES) =    3.73      SUBAREA RUNOFF(CFS) =   11.69
  EFFECTIVE AREA(ACRES) =     16.61   AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.11
  TOTAL AREA(ACRES) =       16.6       PEAK FLOW RATE(CFS) =      52.33

  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  20975.00 TO NODE  20976.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1364.00  DOWNSTREAM(FEET) =  1358.00
  FLOW LENGTH(FEET) =   338.00   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.66
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      52.33
  PIPE TRAVEL TIME(MIN.) =   0.34    Tc(MIN.) =   10.69
  LONGEST FLOWPATH FROM NODE  20970.00 TO NODE  20976.00 =    1985.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20976.50 TO NODE  20976.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   626.00
  ELEVATION DATA: UPSTREAM(FEET) =   1365.00  DOWNSTREAM(FEET) =   1358.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.813
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.701
  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
  "3-4 DWELLINGS/ACRE"       B        0.94      0.75     0.600    56   13.30
  COMMERCIAL                 B        2.21      0.75     0.100    56    9.81
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.249
  SUBAREA AREA(ACRES) =    3.15   INITIAL SUBAREA RUNOFF(CFS) =    9.97

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =   10.69
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.515
  SUBAREA AREA(ACRES) =    3.15      SUBAREA RUNOFF(CFS) =    9.44
  EFFECTIVE AREA(ACRES) =     19.76   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.13
  TOTAL AREA(ACRES) =       19.8       PEAK FLOW RATE(CFS) =      60.75

  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  20976.00 TO NODE  20965.00 IS CODE =  33
----------------------------------------------------------------------------
  >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1358.00
  DOWNSTREAM NODE ELEVATION(FEET) =  1347.00
```

```
  FLOW LENGTH(FEET) =   323.00   MANNING'S N =  0.013

  USER SPECIFIED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  USER SPECIFIED PIPE SYSTEM UNDER PRESSURE
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.24
  PIPE-FLOW(CFS) =      38.48
  PIPEFLOW TRAVEL TIME(MIN.) =   0.44    Tc(MIN.) =  11.13
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.431
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        2.26      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.600
  SUBAREA AREA(ACRES) =    2.26      SUBAREA RUNOFF(CFS) =    6.07
  EFFECTIVE AREA(ACRES) =     22.02    AREA-AVERAGED Fm(INCH/HR) =  0.14
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.18
  TOTAL AREA(ACRES) =       22.0        PEAK FLOW RATE(CFS) =      65.32

  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) =   0.70
  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) =   26.84
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.46
    HALFSTREET FLOOD WIDTH(FEET) =   16.63
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.65
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.13
  LONGEST FLOWPATH FROM NODE  20970.00 TO NODE  20965.00 =    2308.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20965.00 TO NODE  20965.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  4
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.13
  RAINFALL INTENSITY(INCH/HR) =   3.43
  AREA-AVERAGED Fm(INCH/HR) =  0.14
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.18
  EFFECTIVE STREAM AREA(ACRES) =      22.02
  TOTAL STREAM AREA(ACRES) =      22.02
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      65.32
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  20977.00 TO NODE  20965.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   404.00
  ELEVATION DATA: UPSTREAM(FEET) =   1355.00  DOWNSTREAM(FEET) =   1347.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.347
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  4.404
  SUBAREA Tc 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        4.50      0.75     0.100    56    7.35
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     17.53
  TOTAL AREA(ACRES) =      4.50   PEAK FLOW RATE(CFS) =     17.53

  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  20965.00 TO NODE  20965.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  4
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  4 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.35
  RAINFALL INTENSITY(INCH/HR) =   4.40
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       4.50
  TOTAL STREAM AREA(ACRES) =       4.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      17.53
  ** CONFLUENCE DATA **
  STREAM      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1      3591.45   55.01    10044.14    20120.00
     2        15.76    6.01        3.74    20964.00
     3        65.32   11.13       22.02    20970.00
     4        17.53    7.35        4.50    20977.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.32;30M= 0.65;1H= 0.86;3H= 1.49;6H= 2.14;24H= 4.40
  S-GRAPH: VALLEY(DEV.)= 69.1%;VALLEY(UNDEV.)/DESERT= 30.9%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.92; LAG(HR) = 0.73; Fm(INCH/HR) = 0.52; Ybar = 0.59
  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) =    10074.4
```

```
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  20965.00 =   36616.63 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0319; Lca/L=0.4,n=.0286; Lca/L=0.5,n=.0263;Lca/L=0.6,n=.0245
  TIME OF PEAK FLOW(HR) = 16.75  RUNOFF VOLUME(AF) =    1539.39
  PEAK FLOW RATE(CFS) =    3594.98

****************************************************************************
  FLOW PROCESS FROM NODE  20965.00 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) =  1347.00  DOWNSTREAM(FEET) =  1335.00
  FLOW LENGTH(FEET) =   466.11   MANNING'S N =  0.014
  GIVEN BOX BASEWIDTH(FEET) =  23.00   GIVEN BOX HEIGHT(FEET) =  10.00
  FLOWDEPTH IN BOX IS  4.29 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  36.41
  BOX-FLOW(CFS) =    3594.98
  BOX-FLOW TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =   55.23
  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 =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  PEAK FLOW RATE(CFS) =    3594.98    Tc(MIN.) =   55.23
  AREA-AVERAGED Fm(INCH/HR) =  0.52   Ybar = 0.59
  TOTAL AREA(ACRES) =    10074.4

****************************************************************************
  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) =   478.00
  ELEVATION DATA: UPSTREAM(FEET) =   1365.00  DOWNSTREAM(FEET) =   1358.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.347
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  4.079
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        3.00      0.75     0.100    56    8.35
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     10.81
  TOTAL AREA(ACRES) =      3.00   PEAK FLOW RATE(CFS) =     10.81

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.85; 24HR = 5.50

****************************************************************************
  FLOW PROCESS FROM NODE  20961.00 TO NODE  20962.00 IS CODE =  33
----------------------------------------------------------------------------
```



```
  >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1358.00
  DOWNSTREAM NODE ELEVATION(FEET) =  1357.00
  FLOW LENGTH(FEET) =   347.00   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  17.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.37
  PIPE-FLOW(CFS) =      10.81
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   1.42    Tc(MIN.) =   9.77
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.711
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        3.09      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) =    3.09      SUBAREA RUNOFF(CFS) =   10.11
  EFFECTIVE AREA(ACRES) =      6.09    AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        6.1        PEAK FLOW RATE(CFS) =      19.93

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.85; 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) =    9.12
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.48
    HALFSTREET FLOOD WIDTH(FEET) =   17.73
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.40
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.67
  LONGEST FLOWPATH FROM NODE  20960.00 TO NODE  20962.00 =     825.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  20962.00 TO NODE  20963.00 IS CODE =  33
----------------------------------------------------------------------------
  >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1357.00
  DOWNSTREAM NODE ELEVATION(FEET) =  1353.00
  FLOW LENGTH(FEET) =   353.00   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.) =   8.57
 PIPE-FLOW(CFS) =      19.93
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME(MIN.) =   0.74    Tc(MIN.) =  10.51
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.553
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B        2.86      0.75     0.100    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 =  0.220
 SUBAREA AREA(ACRES) =    3.76      SUBAREA RUNOFF(CFS) =   11.47
 EFFECTIVE AREA(ACRES) =      9.85    AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.15
 TOTAL AREA(ACRES) =        9.9        PEAK FLOW RATE(CFS) =      30.53

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.85; 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) =   10.60
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.41
   HALFSTREET FLOOD WIDTH(FEET) =   14.29
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.45
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.01
 LONGEST FLOWPATH FROM NODE  20960.00 TO NODE  20963.00 =    1178.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  20963.00 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) =  1353.00
 DOWNSTREAM NODE ELEVATION(FEET) =  1335.00
 FLOW LENGTH(FEET) =   742.00   MANNING'S N =  0.013

 USER SPECIFIED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
 DEPTH OF FLOW IN  30.0 INCH PIPE IS  14.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  12.87
 PIPE-FLOW(CFS) =      30.53
 *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
 PIPEFLOW TRAVEL TIME(MIN.) =   1.02    Tc(MIN.) =  11.53
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.360
```



```
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B        3.02      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) =    3.02      SUBAREA RUNOFF(CFS) =    8.93
 EFFECTIVE AREA(ACRES) =     12.87    AREA-AVERAGED Fm(INCH/HR) =  0.10
 AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.13
 TOTAL AREA(ACRES) =       12.9        PEAK FLOW RATE(CFS) =      37.75

 SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.85; 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) =    7.22
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.34
   HALFSTREET FLOOD WIDTH(FEET) =   10.46
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.98
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.00
 LONGEST FLOWPATH FROM NODE  20960.00 TO NODE  20968.00 =    1920.00 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.) =   11.53
 RAINFALL INTENSITY(INCH/HR) =   3.36
 AREA-AVERAGED Fm(INCH/HR) =  0.10
 AREA-AVERAGED Fp(INCH/HR) =  0.75
 AREA-AVERAGED Ap =  0.13
 EFFECTIVE STREAM AREA(ACRES) =      12.87
 TOTAL STREAM AREA(ACRES) =      12.87
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      37.75
 ** CONFLUENCE DATA **
 STREAM      Q        Tc      AREA      HEADWATER
 NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
    1      3594.98   55.23    10074.40    20120.00
    2        37.75   11.53       12.87    20960.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.32;30M= 0.65;1H= 0.86;3H= 1.49;6H= 2.14;24H= 4.40
```

```
  S-GRAPH: VALLEY(DEV.)= 69.1%;VALLEY(UNDEV.)/DESERT= 30.9%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.92; LAG(HR) = 0.74; Fm(INCH/HR) = 0.52; Ybar = 0.59
  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) =    10087.3
  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=.0243
  TIME OF PEAK FLOW(HR) = 16.75  RUNOFF VOLUME(AF) =    1544.00
  PEAK FLOW RATE(CFS) =    3591.16
    (UPSTREAM NODE PEAK FLOW RATE(CFS) =    3594.98)
  PEAK FLOW RATE(CFS) USED =    3594.98

****************************************************************************
  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)     =    10087.3  TC(MIN.) =     55.23
  AREA-AVERAGED Fm(INCH/HR)=  0.52   Ybar =  0.59
  PEAK FLOW RATE(CFS)   =   3594.98
============================================================================
============================================================================
  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 21070                      *
* 10-YR  HC ULTIMATE CONDITION    APRIL 2014   MCHANDOO                  *
 ************************************************************************

  FILE NAME: LR0210ZZ.DAT
  TIME/DATE OF STUDY: 16:51 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
```



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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) =  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
  *  10 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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  *  10 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
  *  10 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
```

```
****************************************************************************
  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
  *  10 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
```



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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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
  *  10 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.

****************************************************************************
 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
 *  10 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
 "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
 *  10 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

 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.

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 FLOW PROCESS FROM NODE  21015.00 TO NODE  21032.00 IS CODE =  63
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  >>>>>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
  *  10 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
  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.

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  FLOW PROCESS FROM NODE  21032.00 TO NODE  21032.00 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.) =   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
  *  10 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

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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
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  **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
 *  10 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

  **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
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.689
 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           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
 *  10 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
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  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
  *  10 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
  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:
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  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
  *  10 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):
  5M = 0.46; 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
----------------------------------------------------------------------------
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  >>>>>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
  *  10 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.

****************************************************************************
  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
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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) =      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
  *  10 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
  STREET HALFWIDTH(FEET) = 18.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  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) =      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
  *  10 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
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(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
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    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
  *  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
  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<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   23.79
  *  10 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
```

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  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
  *  10 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
  *  10 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 =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   24.16
  *  10 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
  COMMERCIAL                 B        0.11      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        9.57      0.75     0.600    56
  SCHOOL                     B        4.31      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.596
  SUBAREA AREA(ACRES) =   13.99      SUBAREA RUNOFF(CFS) =   21.55
  EFFECTIVE AREA(ACRES) =    211.51   AREA-AVERAGED Fm(INCH/HR) =  0.35
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.46
  TOTAL AREA(ACRES) =      220.8       PEAK FLOW RATE(CFS) =     344.94

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

****************************************************************************
  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  1.85 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  15.54
  BOX-FLOW(CFS) =     344.94
  BOX-FLOW TRAVEL TIME(MIN.) =   0.71    Tc(MIN.) =   24.87
  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 =  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) =     3594.98    Tc(MIN.) =   55.23
  AREA-AVERAGED Fm(INCH/HR) =  0.52    Ybar = 0.59
  TOTAL AREA(ACRES) =    10087.3
  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) =     3594.98    Tc(MIN.) =   55.23
  AREA-AVERAGED Fm(INCH/HR) =  0.52    Ybar = 0.59
  TOTAL AREA(ACRES) =    10087.3
  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  21093.00 IS CODE =  48
----------------------------------------------------------------------------
  >>>>>COMPUTE BOX-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED BOX SIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1348.00  DOWNSTREAM(FEET) =  1339.00
  FLOW LENGTH(FEET) =   471.00   MANNING'S N =  0.014
  GIVEN BOX BASEWIDTH(FEET) =  23.00   GIVEN BOX HEIGHT(FEET) =  10.00
  FLOWDEPTH IN BOX IS  4.75 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  32.92
  BOX-FLOW(CFS) =    3594.98
  BOX-FLOW TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =   55.47
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21093.00 =   37553.74 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21093.00 TO NODE  21093.00 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) =    3594.98    Tc(MIN.) =   55.47
  AREA-AVERAGED Fm(INCH/HR) =  0.52   Ybar = 0.59
  TOTAL AREA(ACRES) =    10087.3

****************************************************************************
  FLOW PROCESS FROM NODE  21090.00 TO NODE  21091.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   594.00
  ELEVATION DATA: UPSTREAM(FEET) =   1349.00  DOWNSTREAM(FEET) =   1338.00
```

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.687
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.985
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        3.24      0.75     0.100    56    8.69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     11.40
  TOTAL AREA(ACRES) =      3.24   PEAK FLOW RATE(CFS) =     11.40

  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  21091.00 TO NODE  21092.00 IS CODE =  33
----------------------------------------------------------------------------
  >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1338.00
  DOWNSTREAM NODE ELEVATION(FEET) =   615.00
  FLOW LENGTH(FEET) =   401.00   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   3.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  46.25
  PIPE-FLOW(CFS) =      11.40
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =   8.84
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.944
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        4.20      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) =    4.20      SUBAREA RUNOFF(CFS) =   14.63
  EFFECTIVE AREA(ACRES) =      7.44    AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.75  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        7.4        PEAK FLOW RATE(CFS) =      25.91

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

  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) =   0.36
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0180
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200
  STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
  STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =   14.50
```



```
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.23
    HALFSTREET FLOOD WIDTH(FEET) =    5.13
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   19.02
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.35
  LONGEST FLOWPATH FROM NODE  21090.00 TO NODE  21092.00 =     995.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21092.00 TO NODE  21093.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1340.00  DOWNSTREAM(FEET) =  1339.00
  FLOW LENGTH(FEET) =   215.00   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.25
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      25.91
  PIPE TRAVEL TIME(MIN.) =   0.43    Tc(MIN.) =    9.27
  LONGEST FLOWPATH FROM NODE  21090.00 TO NODE  21093.00 =    1210.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21093.00 TO NODE  21093.00 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.) =    9.27
  RAINFALL INTENSITY(INCH/HR) =   3.83
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       7.44
  TOTAL STREAM AREA(ACRES) =       7.44
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      25.91
  ** CONFLUENCE DATA **
  STREAM      Q        Tc      AREA      HEADWATER
  NUMBER    (CFS)    (MIN.)   (ACRES)      NODE
     1      3594.98   55.47    10087.27    20120.00
     2        25.91    9.27        7.44    21090.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.32;30M= 0.65;1H= 0.86;3H= 1.50;6H= 2.14;24H= 4.40
  S-GRAPH: VALLEY(DEV.)= 69.1%;VALLEY(UNDEV.)/DESERT= 30.9%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.92; LAG(HR) = 0.74; Fm(INCH/HR) = 0.52; Ybar = 0.59
  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) =    10094.7
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21093.00 =   37553.74 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) = 16.75  RUNOFF VOLUME(AF) =    1546.73
  PEAK FLOW RATE(CFS) =    3581.69
    (UPSTREAM NODE PEAK FLOW RATE(CFS) =    3594.98)
  PEAK FLOW RATE(CFS) USED =    3594.98

****************************************************************************
  FLOW PROCESS FROM NODE  21093.00 TO NODE  21093.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   55.47
  *  10 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
  COMMERCIAL                 B        9.63      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) =    9.63
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.32;30M= 0.65;1H= 0.86;3H= 1.50;6H= 2.14;24H= 4.41
  S-GRAPH: VALLEY(DEV.)= 69.1%;VALLEY(UNDEV.)/DESERT= 30.9%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.92; LAG(HR) = 0.74; Fm(INCH/HR) = 0.52; Ybar = 0.59
  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) =    10104.3
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21093.00 =   37553.74 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) = 16.75  RUNOFF VOLUME(AF) =    1550.27
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    3588.53
  TOTAL AREA(ACRES) =    10104.3       PEAK FLOW RATE(CFS) =    3594.98
  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  21093.00 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) =  1339.00  DOWNSTREAM(FEET) =  1337.00
  FLOW LENGTH(FEET) =   362.00   MANNING'S N =  0.014
  GIVEN BOX BASEWIDTH(FEET) =  23.00   GIVEN BOX HEIGHT(FEET) =  10.00
  FLOWDEPTH IN BOX IS  7.30 FEET   BOX-FLOW VELOCITY(FEET/SEC.) =  21.40
  BOX-FLOW(CFS) =    3594.98
  BOX-FLOW TRAVEL TIME(MIN.) =   0.28    Tc(MIN.) =   55.75
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21044.00 =   37915.74 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) =     3594.98    Tc(MIN.) =   55.75
  AREA-AVERAGED Fm(INCH/HR) =  0.52    Ybar = 0.59
  TOTAL AREA(ACRES) =    10104.3
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21044.00 =   37915.74 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      344.94   24.83    2.122  0.75( 0.35) 0.46     211.5   21020.00
      2      333.46   27.42    2.000  0.75( 0.35) 0.47     220.4   21010.00
      3      332.32   27.57    1.993  0.75( 0.35) 0.47     220.8   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= 0.32;30M= 0.66;1H= 0.87;3H= 1.51;6H= 2.15;24H= 4.42
  S-GRAPH: VALLEY(DEV.)= 69.8%;VALLEY(UNDEV.)/DESERT= 30.2%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.93; LAG(HR) = 0.74; Fm(INCH/HR) = 0.51; Ybar = 0.59
  USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC  II CONDITION.
  DEPTH-AREA FACTORS: 5M = 0.67; 30M = 0.67; 1HR = 0.68;
  3HR = 0.94; 6HR = 0.97; 24HR= 0.98
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =    10325.1
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21044.00 =   37915.74 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0313; Lca/L=0.4,n=.0280; Lca/L=0.5,n=.0258;Lca/L=0.6,n=.0240
  TIME OF PEAK FLOW(HR) = 16.75  RUNOFF VOLUME(AF) =    1606.93
  PEAK FLOW RATE(CFS) =    3690.05

****************************************************************************
  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  21044.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   55.75
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.306
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        2.03      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        4.70      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.449
  SUBAREA AREA(ACRES) =    6.73
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.32;30M= 0.66;1H= 0.87;3H= 1.51;6H= 2.15;24H= 4.42
  S-GRAPH: VALLEY(DEV.)= 69.8%;VALLEY(UNDEV.)/DESERT= 30.2%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.93; LAG(HR) = 0.74; Fm(INCH/HR) = 0.51; Ybar = 0.59
```

```
  USED SIERRA MADRE DEPTH-AREA CURVES WITH AMC  II CONDITION.
  DEPTH-AREA FACTORS: 5M = 0.67; 30M = 0.67; 1HR = 0.68;
  3HR = 0.94; 6HR = 0.97; 24HR= 0.98
  UNIT-INTERVAL(MIN) =  5.00   TOTAL AREA(ACRES) =    10331.9
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21044.00 =   37915.74 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0313; Lca/L=0.4,n=.0280; Lca/L=0.5,n=.0258;Lca/L=0.6,n=.0240
  TIME OF PEAK FLOW(HR) = 16.75  RUNOFF VOLUME(AF) =    1608.76
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    3693.89
  TOTAL AREA(ACRES) =    10331.9       PEAK FLOW RATE(CFS) =    3693.89

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

****************************************************************************
  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) =    3693.89
  FLOW VELOCITY(FEET/SEC.) =  28.81   FLOW DEPTH(FEET) =   5.09
  TRAVEL TIME(MIN.) =   0.80   Tc(MIN.) =   56.55
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21045.00 =   39300.79 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21045.00 TO NODE  21045.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE  21080.00 TO NODE  21081.00 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) =  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.)
  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) =     27.01
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  TOTAL AREA(ACRES) =      8.79   PEAK FLOW RATE(CFS) =     27.01

  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  21081.00 TO NODE  21082.00 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) =      32.87
    ***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.) =    2.31
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.52
  STREET FLOW TRAVEL TIME(MIN.) =   2.03   Tc(MIN.) =   12.15
  *  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
  "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) =   11.71
  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) =      35.74

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

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.68   HALFSTREET FLOOD WIDTH(FEET) =  26.86
  FLOW VELOCITY(FEET/SEC.) =  2.36   DEPTH*VELOCITY(FT*FT/SEC.) =   1.60
  *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  21082.00
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 LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21082.00 =    1215.82 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  21082.00 TO NODE  21083.00 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) =      40.44
   ***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.) =    1.61
 STREET FLOW TRAVEL TIME(MIN.) =   1.45   Tc(MIN.) =   13.60
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.046
 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) =    9.40
 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) =      42.63

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

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.75   HALFSTREET FLOOD WIDTH(FEET) =  30.52
 FLOW VELOCITY(FEET/SEC.) =  2.20   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  21083.00
 LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21083.00 =    1404.92 FEET.

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 FLOW PROCESS FROM NODE  21083.00 TO NODE  21084.00 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) =      46.91
   ***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.) =   1.52   Tc(MIN.) =   15.12
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.858
 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) =    8.56
 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) =      48.36

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

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.79   HALFSTREET FLOOD WIDTH(FEET) =  32.48
 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  21084.00
 LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21084.00 =    1606.51 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  21084.00 TO NODE  21087.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
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```
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1358.00  DOWNSTREAM(FEET) =  1356.50
  FLOW LENGTH(FEET) =   750.64   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.03
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      48.36
  PIPE TRAVEL TIME(MIN.) =   2.49    Tc(MIN.) =   17.61
  LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21087.00 =    2357.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21087.00 TO NODE  21087.00 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.) =   17.61
  RAINFALL INTENSITY(INCH/HR) =   2.61
  AREA-AVERAGED Fm(INCH/HR) =  0.22
  AREA-AVERAGED Fp(INCH/HR) =  0.75
  AREA-AVERAGED Ap =  0.30
  EFFECTIVE STREAM AREA(ACRES) =      20.39
  TOTAL STREAM AREA(ACRES) =      20.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      48.36

****************************************************************************
  FLOW PROCESS FROM NODE  21085.00 TO NODE  21084.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   560.00
  ELEVATION DATA: UPSTREAM(FEET) =   1358.50  DOWNSTREAM(FEET) =   1358.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   15.559
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.809
  SUBAREA Tc 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        0.14      0.98     0.500    32   19.91
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        1.29      0.75     0.500    56   19.91
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B        0.85      0.75     0.600    56   21.09
  COMMERCIAL                 B        1.55      0.75     0.100    56   15.56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.76
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.360
  SUBAREA RUNOFF(CFS) =      8.74
  TOTAL AREA(ACRES) =      3.83   PEAK FLOW RATE(CFS) =      8.74

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 2.03; 6HR = 2.75; 24HR = 5.50
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****************************************************************************
  FLOW PROCESS FROM NODE  21085.00 TO NODE  21086.00 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) =      13.43
    ***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.) =    1.53
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.83
  STREET FLOW TRAVEL TIME(MIN.) =   2.27   Tc(MIN.) =   17.83
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.589
  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) =    9.36
  EFFECTIVE AREA(ACRES) =      8.20    AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.79  AREA-AVERAGED Ap =  0.30
  TOTAL AREA(ACRES) =        8.2        PEAK FLOW RATE(CFS) =      17.35

  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) = 0.58   HALFSTREET FLOOD WIDTH(FEET) =  22.04
  FLOW VELOCITY(FEET/SEC.) =  1.66   DEPTH*VELOCITY(FT*FT/SEC.) =   0.96
  *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  21086.00
  LONGEST FLOWPATH FROM NODE  21085.00 TO NODE  21086.00 =     767.50 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21086.00 TO NODE  21087.00 IS CODE =  63
----------------------------------------------------------------------------
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  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  5 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1357.00  DOWNSTREAM ELEVATION(FEET) = 1356.50
  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) =      23.38
    ***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.) =    1.52
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.03
  STREET FLOW TRAVEL TIME(MIN.) =   3.76   Tc(MIN.) =   21.58
  *  10 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
  "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) =   12.05
  EFFECTIVE AREA(ACRES) =     14.61    AREA-AVERAGED Fm(INCH/HR) =  0.23
  AREA-AVERAGED Fp(INCH/HR) =  0.83  AREA-AVERAGED Ap =  0.28
  TOTAL AREA(ACRES) =       14.6        PEAK FLOW RATE(CFS) =      27.32

  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) = 0.72   HALFSTREET FLOOD WIDTH(FEET) =  28.75
  FLOW VELOCITY(FEET/SEC.) =  1.58   DEPTH*VELOCITY(FT*FT/SEC.) =   1.13
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  341.5 FT WITH ELEVATION-DROP =   0.5 FT, IS   18.1 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE  21087.00
  LONGEST FLOWPATH FROM NODE  21085.00 TO NODE  21087.00 =    1109.05 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21087.00 TO NODE  21087.00 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.) =   21.58
  RAINFALL INTENSITY(INCH/HR) =   2.31
  AREA-AVERAGED Fm(INCH/HR) =  0.23
  AREA-AVERAGED Fp(INCH/HR) =  0.83
  AREA-AVERAGED Ap =  0.28
  EFFECTIVE STREAM AREA(ACRES) =      14.61
  TOTAL STREAM AREA(ACRES) =      14.61
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      27.32

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       48.36   17.61    2.608  0.75( 0.22) 0.30      20.4   21080.00
      2       27.32   21.58    2.308  0.83( 0.23) 0.28      14.6   21085.00

  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       73.86   17.61    2.608  0.78( 0.23) 0.29      32.3   21080.00
      2       69.60   21.58    2.308  0.78( 0.23) 0.29      35.0   21085.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      73.86    Tc(MIN.) =    17.61
  EFFECTIVE AREA(ACRES) =      32.31   AREA-AVERAGED Fm(INCH/HR) =  0.23
  AREA-AVERAGED Fp(INCH/HR) =  0.78  AREA-AVERAGED Ap =  0.29
  TOTAL AREA(ACRES) =       35.0
  LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21087.00 =    2357.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21087.00 TO NODE  21088.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1356.00  DOWNSTREAM(FEET) =  1336.00
  FLOW LENGTH(FEET) =  1357.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  22.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.52
  GIVEN PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      73.86
  PIPE TRAVEL TIME(MIN.) =   1.81    Tc(MIN.) =   19.42
  LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21088.00 =    3714.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21088.50 TO NODE  21088.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =  1495.00
  ELEVATION DATA: UPSTREAM(FEET) =   1354.00  DOWNSTREAM(FEET) =   1336.00
```

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.696
  *  10 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.)
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       A        3.91      0.98      0.600    32   18.56
  COMMERCIAL                 A        7.31      0.98      0.100    32   13.70
  COMMERCIAL                 B        7.68      0.75      0.100    56   13.70
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A        1.19      0.98      0.500    32   17.53
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.94
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.221
  SUBAREA AREA(ACRES) =   20.09   INITIAL SUBAREA RUNOFF(CFS) =   51.10

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =   19.42
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.460
  SUBAREA AREA(ACRES) =   20.09      SUBAREA RUNOFF(CFS) =   40.74
  EFFECTIVE AREA(ACRES) =     52.40   AREA-AVERAGED Fm(INCH/HR) =  0.22
  AREA-AVERAGED Fp(INCH/HR) =  0.83  AREA-AVERAGED Ap =  0.26
  TOTAL AREA(ACRES) =       55.1       PEAK FLOW RATE(CFS) =     105.70

  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  21088.00 TO NODE  21096.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1336.00  DOWNSTREAM(FEET) =  1335.00
  FLOW LENGTH(FEET) =   413.00   MANNING'S N =  0.014
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.65
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  54.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     105.70
  PIPE TRAVEL TIME(MIN.) =   1.04    Tc(MIN.) =   20.45
  LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21096.00 =    4127.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21096.00 TO NODE  21096.00 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.) =   20.45
  RAINFALL INTENSITY(INCH/HR) =   2.38
  AREA-AVERAGED Fm(INCH/HR) =  0.22
  AREA-AVERAGED Fp(INCH/HR) =  0.83
  AREA-AVERAGED Ap =  0.26
  EFFECTIVE STREAM AREA(ACRES) =      52.40
  TOTAL STREAM AREA(ACRES) =      55.09
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     105.70
```



```
****************************************************************************
  FLOW PROCESS FROM NODE  21094.00 TO NODE  21095.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   542.00
  ELEVATION DATA: UPSTREAM(FEET) =   1354.00  DOWNSTREAM(FEET) =   1350.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.066
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.648
  SUBAREA Tc 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                 A        3.86      0.98      0.100    32   10.07
  COMMERCIAL                 B        1.36      0.75      0.100    56   10.07
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.92
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     16.71
  TOTAL AREA(ACRES) =      5.22   PEAK FLOW RATE(CFS) =     16.71

  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  21095.00 TO NODE  21096.00 IS CODE =  33
----------------------------------------------------------------------------
  >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1350.00
  DOWNSTREAM NODE ELEVATION(FEET) =  1335.00
  FLOW LENGTH(FEET) =   850.00   MANNING'S N =  0.014

  USER SPECIFIED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  11.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.25
  PIPE-FLOW(CFS) =      16.71
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   1.63    Tc(MIN.) =  11.69
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.335
  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"       A        3.79      0.98      0.500    32
  COMMERCIAL                 B        1.00      0.75      0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.96
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.416
  SUBAREA AREA(ACRES) =    4.79      SUBAREA RUNOFF(CFS) =   12.65
  EFFECTIVE AREA(ACRES) =     10.01    AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.95  AREA-AVERAGED Ap =  0.25
  TOTAL AREA(ACRES) =       10.0        PEAK FLOW RATE(CFS) =      27.88

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.94; 6HR = 2.56; 24HR = 4.77
```

```
  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) =   11.17
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.39
    HALFSTREET FLOOD WIDTH(FEET) =   13.35
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.94
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.16
  LONGEST FLOWPATH FROM NODE  21094.00 TO NODE  21096.00 =    1392.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21096.00 TO NODE  21096.00 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.) =   11.69
  RAINFALL INTENSITY(INCH/HR) =   3.33
  AREA-AVERAGED Fm(INCH/HR) =  0.24
  AREA-AVERAGED Fp(INCH/HR) =  0.95
  AREA-AVERAGED Ap =  0.25
  EFFECTIVE STREAM AREA(ACRES) =      10.01
  TOTAL STREAM AREA(ACRES) =      10.01
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      27.88

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1      105.70   20.45    2.384  0.83( 0.22) 0.26      52.4   21080.00
      1       98.13   24.53    2.138  0.83( 0.22) 0.26      55.1   21085.00
      2       27.88   11.69    3.335  0.95( 0.24) 0.25      10.0   21094.00

  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      114.83   11.69    3.335  0.86( 0.22) 0.26      40.0   21094.00
      2      125.02   20.45    2.384  0.85( 0.22) 0.26      62.4   21080.00
      3      115.23   24.53    2.138  0.85( 0.22) 0.26      65.1   21085.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     125.02    Tc(MIN.) =    20.45
  EFFECTIVE AREA(ACRES) =      62.41   AREA-AVERAGED Fm(INCH/HR) =  0.22
  AREA-AVERAGED Fp(INCH/HR) =  0.85  AREA-AVERAGED Ap =  0.26
```



```
  TOTAL AREA(ACRES) =       65.1
  LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21096.00 =    4127.15 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21096.00 TO NODE  21097.00 IS CODE =  33
----------------------------------------------------------------------------
  >>>>>COMPUTE COUPLED PIPEFLOW/STREETFLOW THRU SUBAREA<<<<<
  >>USING USER-SPECIFIED PIPESIZE(PARALLEL/REPLACEMENT PIPESIZE ESTIMATED)<<
============================================================================
  UPSTREAM NODE ELEVATION(FEET) =  1335.00
  DOWNSTREAM NODE ELEVATION(FEET) =  1317.00
  FLOW LENGTH(FEET) =  1424.00   MANNING'S N =  0.014

  USER SPECIFIED PIPE DIAMETER(INCH) =  60.00    NUMBER OF PIPES =   1
  DEPTH OF FLOW IN  60.0 INCH PIPE IS  28.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.56
  PIPE-FLOW(CFS) =     125.02
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   1.86    Tc(MIN.) =  22.31
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.263
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       23.81      0.75     0.100    56
  RESIDENTIAL
  "3-4 DWELLINGS/ACRE"       B       12.27      0.75     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.270
  SUBAREA AREA(ACRES) =   36.08      SUBAREA RUNOFF(CFS) =   66.93
  EFFECTIVE AREA(ACRES) =     98.49    AREA-AVERAGED Fm(INCH/HR) =  0.21
  AREA-AVERAGED Fp(INCH/HR) =  0.81  AREA-AVERAGED Ap =  0.26
  TOTAL AREA(ACRES) =      101.2        PEAK FLOW RATE(CFS) =     181.57

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.94; 6HR = 2.56; 24HR = 4.77

  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) =   56.55
    ***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.) =    4.22
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.72
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  1424.0 FT WITH ELEVATION-DROP =  18.0 FT, IS   93.7 CFS,
         WHICH EXCEEDS THE SPECIFIED STREET CAPACITY AT NODE  21097.00
```

```
 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      193.91   13.59    3.047  0.80( 0.21) 0.27      76.0   21094.00
     2      181.57   22.31    2.263  0.81( 0.21) 0.26      98.5   21080.00
     3      166.57   26.43    2.044  0.81( 0.22) 0.27     101.2   21085.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     193.91  Tc(MIN.) =   13.59
 AREA-AVERAGED Fm(INCH/HR) =  0.21  AREA-AVERAGED Fp(INCH/HR) =  0.80
 AREA-AVERAGED Ap =  0.27  EFFECTIVE AREA(ACRES) =      76.05
 LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21097.00 =    5551.15 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  21097.00 TO NODE  21045.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1317.00  DOWNSTREAM(FEET) =  1295.00
 FLOW LENGTH(FEET) =   885.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  66.0 INCH PIPE IS  28.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  19.37
 GIVEN PIPE DIAMETER(INCH) =  66.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     193.91
 PIPE TRAVEL TIME(MIN.) =   0.76    Tc(MIN.) =   14.35
 LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21045.00 =    6436.15 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE  21045.50 TO NODE  21045.00 IS CODE =  82
----------------------------------------------------------------------------
 >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
 >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =  1687.00
 ELEVATION DATA: UPSTREAM(FEET) =   1340.00  DOWNSTREAM(FEET) =   1295.00

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.260
 *  10 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
 "3-4 DWELLINGS/ACRE"       B        6.36      0.75     0.600    56   16.62
 COMMERCIAL                 B       19.28      0.75     0.100    56   12.26
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.75
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.224
 SUBAREA AREA(ACRES) =   25.64   INITIAL SUBAREA RUNOFF(CFS) =   70.93

 ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
 MAINLINE Tc(MIN.) =   14.35
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.949
 SUBAREA AREA(ACRES) =   25.64      SUBAREA RUNOFF(CFS) =   64.18
 EFFECTIVE AREA(ACRES) =    101.69   AREA-AVERAGED Fm(INCH/HR) =  0.26
 AREA-AVERAGED Fp(INCH/HR) =  0.80  AREA-AVERAGED Ap =  0.32
 TOTAL AREA(ACRES) =      126.8       PEAK FLOW RATE(CFS) =     246.40

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



```
 5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 1.94; 6HR = 2.56; 24HR = 4.77

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      251.37   14.35    2.949  0.79( 0.20) 0.25     101.7   21094.00
     2      224.80   23.09    2.217  0.80( 0.20) 0.26     124.1   21080.00
     3      205.77   27.22    2.008  0.80( 0.21) 0.26     126.8   21085.00
 NEW PEAK FLOW DATA ARE:
 PEAK FLOW RATE(CFS) =     251.37  Tc(MIN.) =   14.35
 AREA-AVERAGED Fm(INCH/HR) =  0.20  AREA-AVERAGED Fp(INCH/HR) =  0.79
 AREA-AVERAGED Ap =  0.25  EFFECTIVE AREA(ACRES) =     101.69

****************************************************************************
 FLOW PROCESS FROM NODE  21045.00 TO NODE  21045.00 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      251.37   14.35    2.949  0.79( 0.20) 0.25     101.7   21094.00
     2      224.80   23.09    2.217  0.80( 0.20) 0.26     124.1   21080.00
     3      205.77   27.22    2.008  0.80( 0.21) 0.26     126.8   21085.00
 LONGEST FLOWPATH FROM NODE  21080.00 TO NODE  21045.00 =    6436.15 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
 PEAK FLOW RATE(CFS) =     3693.89    Tc(MIN.) =   56.55
 AREA-AVERAGED Fm(INCH/HR) =  0.51    Ybar = 0.59
 TOTAL AREA(ACRES) =    10331.9
 LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21045.00 =   39300.79 FEET.

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.32;30M= 0.66;1H= 0.87;3H= 1.51;6H= 2.16;24H= 4.43
 S-GRAPH: VALLEY(DEV.)= 70.2%;VALLEY(UNDEV.)/DESERT= 29.8%
          MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
 Tc(HR) = 0.94; LAG(HR) = 0.75; Fm(INCH/HR) = 0.51; Ybar = 0.58
 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) =    10458.7
 LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21045.00 =   39300.79 FEET.
  EQUIVALENT BASIN FACTOR APPROXIMATIONS:
  Lca/L=0.3,n=.0308; Lca/L=0.4,n=.0276; Lca/L=0.5,n=.0254;Lca/L=0.6,n=.0237
 TIME OF PEAK FLOW(HR) = 16.83  RUNOFF VOLUME(AF) =    1646.96
 PEAK FLOW RATE(CFS) =    3721.77

****************************************************************************
 FLOW PROCESS FROM NODE  21045.00 TO NODE  21045.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   56.55
 *  10 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
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       A       20.17      0.98     0.500    32
  COMMERCIAL                 A        5.87      0.98     0.100    32
  COMMERCIAL                 B        0.05      0.75     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.97
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.409
  SUBAREA AREA(ACRES) =   26.09
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.32;30M= 0.66;1H= 0.87;3H= 1.51;6H= 2.16;24H= 4.44
  S-GRAPH: VALLEY(DEV.)= 70.3%;VALLEY(UNDEV.)/DESERT= 29.7%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.94; LAG(HR) = 0.75; Fm(INCH/HR) = 0.51; Ybar = 0.58
  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) =    10484.8
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21045.00 =   39300.79 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0308; Lca/L=0.4,n=.0276; Lca/L=0.5,n=.0254;Lca/L=0.6,n=.0237
  TIME OF PEAK FLOW(HR) = 16.83  RUNOFF VOLUME(AF) =    1653.74
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    3736.06
  TOTAL AREA(ACRES) =    10484.8       PEAK FLOW RATE(CFS) =    3736.06

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

****************************************************************************
  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) =    3736.06
  FLOW VELOCITY(FEET/SEC.) =  28.77   FLOW DEPTH(FEET) =   5.14
  TRAVEL TIME(MIN.) =   1.59   Tc(MIN.) =   58.14
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21046.00 =   42045.56 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21046.00 TO NODE  21046.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   58.14
  *  10 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
  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
```



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  "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= 0.33;30M= 0.66;1H= 0.87;3H= 1.52;6H= 2.16;24H= 4.44
  S-GRAPH: VALLEY(DEV.)= 70.5%;VALLEY(UNDEV.)/DESERT= 29.5%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 0.97; LAG(HR) = 0.78; Fm(INCH/HR) = 0.51; Ybar = 0.58
  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) =    10567.2
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21046.00 =   42045.56 FEET.
   EQUIVALENT BASIN FACTOR APPROXIMATIONS:
   Lca/L=0.3,n=.0298; Lca/L=0.4,n=.0267; Lca/L=0.5,n=.0246;Lca/L=0.6,n=.0229
  TIME OF PEAK FLOW(HR) = 16.83  RUNOFF VOLUME(AF) =    1679.67
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    3812.45
  TOTAL AREA(ACRES) =    10567.2       PEAK FLOW RATE(CFS) =    3812.45

  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) =    3812.45
  FLOW VELOCITY(FEET/SEC.) =  26.18   FLOW DEPTH(FEET) =   5.15
  TRAVEL TIME(MIN.) =   1.73   Tc(MIN.) =   59.87
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21069.00 =   44763.59 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21069.00 TO NODE  21069.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   59.87
  *  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
  "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
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  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.268
  SUBAREA AREA(ACRES) =   46.47
  UNIT-HYDROGRAPH DATA:
  RAINFALL(INCH): 5M= 0.33;30M= 0.67;1H= 0.88;3H= 1.52;6H= 2.16;24H= 4.44
  S-GRAPH: VALLEY(DEV.)= 70.6%;VALLEY(UNDEV.)/DESERT= 29.4%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 1.00; LAG(HR) = 0.80; Fm(INCH/HR) = 0.51; Ybar = 0.58
  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) =    10613.7
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21069.00 =   44763.59 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) =    1692.58
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    3793.26
  TOTAL AREA(ACRES) =    10613.7       PEAK FLOW RATE(CFS) =    3812.45
  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
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.396
  *  10 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
```



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----------------------------------------------------------------------------
  >>>>>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
  *  10 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)<<<<<
```

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==========================================================================
  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
  *  10 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

  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
```



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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) =     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
  *  10 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
  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) =  30.00    NUMBER OF PIPES =   1
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.15
  PIPE-FLOW(CFS) =      40.05
  PIPEFLOW TRAVEL TIME(MIN.) =   2.93    Tc(MIN.) =  16.49
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.713
```

```
  SUBAREA AREA(ACRES) =   45.56      SUBAREA RUNOFF(CFS) =   98.98
  TOTAL AREA(ACRES) =       84.9        PEAK FLOW RATE(CFS) =     187.50

  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) =  147.45
    ***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.) =    5.13
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.56
  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.) =   16.49
  RAINFALL INTENSITY(INCH/HR) =   2.71
  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 =     187.50

****************************************************************************
  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) =  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
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****************************************************************************
  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
  *  10 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
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------------------------------------------------------------------------------
  >>>>>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
  *  10 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
  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
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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) =   0.91

    **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
  *  10 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
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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) =   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
  *  10 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
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    ***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
  *  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
  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
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.738
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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
  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
  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      187.50   16.49    2.713  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      249.58   16.49    2.713  0.94( 0.26) 0.27     112.3   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) =     249.58    Tc(MIN.) =    16.49
  EFFECTIVE AREA(ACRES) =     112.34   AREA-AVERAGED Fm(INCH/HR) =  0.26
```



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  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  62.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.10
  PIPE-FLOW(CFS) =     249.58
  *NOTE: USER SPECIFIED PIPE SYSTEM CAN CARRY TOTAL UPSTREAM FLOW*
  PIPEFLOW TRAVEL TIME(MIN.) =   2.99    Tc(MIN.) =  19.48
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.455
  SUBAREA LOSS RATE 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) =  143.13
  EFFECTIVE AREA(ACRES) =    181.67    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) =     365.29

  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) =  115.71
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  1.10
    HALFSTREET FLOOD WIDTH(FEET) =   60.91
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.17
```

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   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.39
 *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      365.29   19.48    2.455  0.91( 0.22) 0.24     181.7   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) =     365.29  Tc(MIN.) =   19.48
 AREA-AVERAGED Fm(INCH/HR) =  0.22  AREA-AVERAGED Fp(INCH/HR) =  0.91
 AREA-AVERAGED Ap =  0.24  EFFECTIVE AREA(ACRES) =     181.67
 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
 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.) =  21.98
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.283
 SUBAREA LOSS RATE DATA(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) =   67.16
 EFFECTIVE AREA(ACRES) =    216.01    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) =     397.55

 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
 STREETFLOW HYDRAULICS BASED ON MAINLINE Tc :
 STREET HYDRAULICS COMPUTED USING ESTIMATED FLOW(CFS) =   36.69
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.79
   HALFSTREET FLOOD WIDTH(FEET) =   37.81
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.74
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.37
 *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      404.39   21.98    2.283  0.92( 0.20) 0.22     216.0   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) =     404.39  Tc(MIN.) =   21.98
 AREA-AVERAGED Fm(INCH/HR) =  0.20  AREA-AVERAGED Fp(INCH/HR) =  0.92
 AREA-AVERAGED Ap =  0.22  EFFECTIVE AREA(ACRES) =     216.01
 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      404.39   21.98    2.283  0.92( 0.20) 0.22     216.0   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) =     3812.45    Tc(MIN.) =   59.87
 AREA-AVERAGED Fm(INCH/HR) =  0.51    Ybar = 0.58
 TOTAL AREA(ACRES) =    10613.7
 LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21069.00 =   44763.59 FEET.

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 UNIT-HYDROGRAPH DATA:
 RAINFALL(INCH): 5M= 0.33;30M= 0.67;1H= 0.88;3H= 1.53;6H= 2.17;24H= 4.45
 S-GRAPH: VALLEY(DEV.)= 71.3%;VALLEY(UNDEV.)/DESERT= 28.7%
          MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
 Tc(HR) = 1.00; LAG(HR) = 0.80; Fm(INCH/HR) = 0.50; Ybar = 0.57
 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) =    10859.9
 LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21069.00 =   44763.59 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) =    1762.54
 PEAK FLOW RATE(CFS) =    3936.59
```

```
****************************************************************************
  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) =    3936.59
  FLOW VELOCITY(FEET/SEC.) =  25.32   FLOW DEPTH(FEET) =   5.40
  TRAVEL TIME(MIN.) =   1.84   Tc(MIN.) =   61.71
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21070.00 =   47559.06 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE  21070.00 TO NODE  21070.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   61.71
  *  10 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
  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= 0.33;30M= 0.67;1H= 0.89;3H= 1.53;6H= 2.17;24H= 4.45
  S-GRAPH: VALLEY(DEV.)= 71.6%;VALLEY(UNDEV.)/DESERT= 28.4%
           MOUNTAIN=  0.0%;FOOTHILL=  0.0%;DESERT(UNDEV.)=  0.0%
  Tc(HR) = 1.03; LAG(HR) = 0.82; Fm(INCH/HR) = 0.50; Ybar = 0.57
  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) =    10990.4
  LONGEST FLOWPATH FROM NODE  20120.00 TO NODE  21070.00 =   47559.06 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) =    1802.28
  UNIT-HYDROGRAPH PEAK FLOW RATE(CFS) =    3908.84
  TOTAL AREA(ACRES) =    10990.4       PEAK FLOW RATE(CFS) =    3936.59
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  SUBAREA AREA-AVERAGED RAINFALL DEPTH(INCH):
  5M = 0.46; 30M = 0.95; 1HR = 1.25; 3HR = 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)     =    10990.4  TC(MIN.) =     61.71
  AREA-AVERAGED Fm(INCH/HR)=  0.50   Ybar =  0.57
  PEAK FLOW RATE(CFS)   =   3936.59
============================================================================
============================================================================
  END OF INTEGRATED RATIONAL/UNIT-HYDROGRAPH METHOD ANALYSIS
```

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

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                        Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* REDLANDS MPD UPDATE - AREA TRIBUTARY TO OPAL BASIN                    *
* WITH REVISED N VALUES ON MAIN ZANJA CHANNEL                           *
* BY TMULI    SEPTEMBER 2013                                            *
 ************************************************************************

  FILE NAME: 353A.DAT
  TIME/DATE OF STUDY: 09:15 09/25/2013


************************************************************************
  FLOW PROCESS FROM NODE    353.00 TO NODE    353.00 IS CODE =   1
------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
========================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =    4029.500 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.580 HOURS
         VALLEY(DEVELOPED):
                  "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.406
         FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.000
         MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.000
         VALLEY(UNDEVELOPED)/DESERT:
                  "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.594
         DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.000
         MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) =  0.580
         LOW LOSS FRACTION = 0.540
         *HYDROGRAPH MODEL #1 SPECIFIED*

         SPECIFIED PEAK  5-MINUTES RAINFALL(INCH)=  0.45
         SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)=  0.93
         SPECIFIED PEAK  1-HOUR RAINFALL(INCH) =  1.22
         SPECIFIED PEAK  3-HOUR RAINFALL(INCH) =  2.05
         SPECIFIED PEAK  6-HOUR RAINFALL(INCH) =  2.84
         SPECIFIED PEAK 24-HOUR RAINFALL(INCH) =  6.99

         *USER SPECIFIED PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
           5-MINUTE FACTOR = 0.800
          30-MINUTE FACTOR = 0.820
           1-HOUR FACTOR = 0.820
```



```
           3-HOUR FACTOR = 0.973
           6-HOUR FACTOR = 0.987
          24-HOUR FACTOR = 0.992

         UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  14.368
```

UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	1.048	510.905
2	3.604	1245.266
3	7.893	2090.429
4	14.680	3307.073
5	23.504	4300.043
6	33.552	4896.684
7	44.502	5336.008
8	54.904	5069.075
9	63.371	4126.129
10	69.837	3151.007
11	74.809	2423.077
12	78.667	1880.098
13	81.579	1419.160
14	83.951	1155.937
15	85.883	941.323
16	87.386	732.586
17	88.696	638.091
18	89.625	452.741
19	90.486	419.874
20	91.263	378.356
21	91.984	351.390
22	92.623	311.589
23	93.231	296.145
24	93.841	297.521
25	94.309	227.943
26	94.706	193.441
27	95.102	193.087
28	95.449	168.768
29	95.765	154.053
30	96.081	154.053
31	96.392	151.733
32	96.656	128.555
33	96.907	122.298
34	97.158	122.376
35	97.409	122.298
36	97.642	113.721
37	97.813	83.341
38	97.979	80.824
39	98.145	80.664
40	98.311	80.824
41	98.476	80.664
42	98.642	80.828

43	98.796	74.998
44	98.871	36.830
45	98.933	29.907
46	98.994	29.825
47	99.055	29.907
48	99.117	29.825
49	99.178	29.825
50	99.239	29.907
51	99.300	29.825
52	99.362	29.829
53	99.423	29.825
54	99.484	29.829
55	99.545	29.825
56	99.606	29.829
57	99.668	29.829
58	99.729	29.825
59	99.790	29.829
60	99.851	29.825
61	99.912	29.829
62	99.974	29.825
63	100.000	12.834

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 1202.3899

TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1125.2114

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2 4 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

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HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 750.0 1500.0 2250.0 3000.0
0.083	0.0255	3.70	Q . . . .
0.167	0.1131	12.72	Q . . . .
0.250	0.3052	27.89	Q . . . .
0.333	0.6625	51.88	Q . . . .
0.417	1.2349	83.11	VQ . . . .
0.500	2.0525	118.72	VQ . . . .
0.583	3.1377	157.57	V Q . . . .
0.667	4.4777	194.57	V Q . . . .
0.750	6.0259	224.80	V Q . . . .
0.833	7.7341	248.03	V Q . . . .
0.917	9.5662	266.03	V Q . . . .
1.000	11.4955	280.13	V Q . . . .
1.083	13.4992	290.93	V Q . . . .
1.167	15.5642	299.84	V Q . . . .
1.250	17.6800	307.22	V Q . . . .
1.333	19.8364	313.10	V Q . . . .
1.417	22.0287	318.32	V Q . . . .
1.500	24.2477	322.20	V Q . . . .
1.583	26.4919	325.86	V Q . . . .
1.667	28.7593	329.22	.V Q . . . .
1.750	31.0486	332.40	.V Q . . . .
1.833	33.3578	335.31	.V Q . . . .
1.917	35.6864	338.11	.V Q . . . .
2.000	38.0344	340.92	.V Q . . . .
2.083	40.3983	343.25	.V Q . . . .
2.167	42.7766	345.33	.V Q . . . .
2.250	45.1693	347.42	.V Q . . . .
2.333	47.5751	349.33	.V Q . . . .
2.417	49.9936	351.15	.V Q . . . .
2.500	52.4246	352.98	.V Q . . . .
2.583	54.8681	354.80	.V Q . . . .
2.667	57.3230	356.46	. V Q . . . .
2.750	59.7891	358.08	. V Q . . . .
2.833	62.2664	359.70	. V Q . . . .
2.917	64.7550	361.34	. V Q . . . .
3.000	67.2544	362.92	. V Q . . . .
3.083	69.7633	364.29	. V Q . . . .
3.167	72.2815	365.65	. V Q . . . .
3.250	74.8092	367.01	. V Q . . . .
3.333	77.3463	368.38	. V Q . . . .
3.417	79.8928	369.76	. V Q . . . .
3.500	82.4490	371.15	. V Q . . . .
3.583	85.0144	372.51	. VQ . . . .
3.667	87.5874	373.59	. VQ . . . .
3.750	90.1675	374.63	. VQ . . . .
3.833	92.7549	375.68	. V Q . . . .
3.917	95.3495	376.74	. V Q . . . .

4.000	97.9515	377.81	.	V Q	.	.	.	.	.
4.083	100.5609	378.88	.	V Q	.	.	.	.	.
4.167	103.1777	379.96	.	V Q	.	.	.	.	.
4.250	105.8021	381.05	.	V Q	.	.	.	.	.
4.333	108.4339	382.15	.	V Q	.	.	.	.	.
4.417	111.0735	383.26	.	V Q	.	.	.	.	.
4.500	113.7206	384.37	.	VQ	.	.	.	.	.
4.583	116.3756	385.49	.	VQ	.	.	.	.	.
4.667	119.0383	386.63	.	VQ	.	.	.	.	.
4.750	121.7088	387.77	.	VQ	.	.	.	.	.
4.833	124.3873	388.92	.	VQ	.	.	.	.	.
4.917	127.0738	390.08	.	VQ	.	.	.	.	.
5.000	129.7683	391.24	.	VQ	.	.	.	.	.
5.083	132.4710	392.42	.	VQ	.	.	.	.	.
5.167	135.1818	393.61	.	VQ	.	.	.	.	.
5.250	137.9000	394.69	.	VQ	.	.	.	.	.
5.333	140.6251	395.68	.	VQ	.	.	.	.	.
5.417	143.3570	396.68	.	Q	.	.	.	.	.
5.500	146.0959	397.69	.	Q	.	.	.	.	.
5.583	148.8419	398.71	.	Q	.	.	.	.	.
5.667	151.5949	399.74	.	Q	.	.	.	.	.
5.750	154.3552	400.79	.	Q	.	.	.	.	.
5.833	157.1226	401.84	.	Q	.	.	.	.	.
5.917	159.8974	402.90	.	Q	.	.	.	.	.
6.000	162.6796	403.98	.	Q	.	.	.	.	.
6.083	165.4693	405.06	.	Q	.	.	.	.	.
6.167	168.2666	406.16	.	Q	.	.	.	.	.
6.250	171.0715	407.27	.	QV	.	.	.	.	.
6.333	173.8840	408.39	.	QV	.	.	.	.	.
6.417	176.7045	409.52	.	QV	.	.	.	.	.
6.500	179.5327	410.67	.	QV	.	.	.	.	.
6.583	182.3690	411.83	.	QV	.	.	.	.	.
6.667	185.2133	413.00	.	QV	.	.	.	.	.
6.750	188.0658	414.18	.	QV	.	.	.	.	.
6.833	190.9266	415.38	.	QV	.	.	.	.	.
6.917	193.7957	416.59	.	QV	.	.	.	.	.
7.000	196.6732	417.81	.	QV	.	.	.	.	.
7.083	199.5592	419.05	.	Q V	.	.	.	.	.
7.167	202.4539	420.31	.	Q V	.	.	.	.	.
7.250	205.3573	421.58	.	Q V	.	.	.	.	.
7.333	208.2696	422.86	.	Q V	.	.	.	.	.
7.417	211.1908	424.16	.	Q V	.	.	.	.	.
7.500	214.1210	425.47	.	Q V	.	.	.	.	.
7.583	217.0605	426.80	.	Q V	.	.	.	.	.
7.667	220.0091	428.15	.	Q V	.	.	.	.	.
7.750	222.9672	429.51	.	Q V	.	.	.	.	.
7.833	225.9348	430.89	.	Q V	.	.	.	.	.
7.917	228.9120	432.29	.	Q V	.	.	.	.	.
8.000	231.8990	433.71	.	Q V	.	.	.	.	.
8.083	234.8958	435.14	.	Q V	.	.	.	.	.
8.167	237.9027	436.59	.	Q V	.	.	.	.	.
8.250	240.9197	438.07	.	Q V	.	.	.	.	.
8.333	243.9469	439.56	.	Q V	.	.	.	.	.
8.417	246.9846	441.07	.	Q V	.	.	.	.	.
8.500	250.0328	442.60	.	Q V	.	.	.	.	.
8.583	253.0917	444.16	.	Q V	.	.	.	.	.
8.667	256.1615	445.73	.	Q V.	.	.	.	.	.
8.750	259.2423	447.33	.	Q V.	.	.	.	.	.

8.833	262.3342	448.95	.	Q V.	.	.	.	.	.
8.917	265.4374	450.59	.	Q V.	.	.	.	.	.
9.000	268.5522	452.25	.	Q V.	.	.	.	.	.
9.083	271.6785	453.95	.	Q V.	.	.	.	.	.
9.167	274.8167	455.66	.	Q V.	.	.	.	.	.
9.250	277.9668	457.40	.	Q V.	.	.	.	.	.
9.333	281.1292	459.17	.	Q V.	.	.	.	.	.
9.417	284.3038	460.97	.	Q V	.	.	.	.	.
9.500	287.4911	462.79	.	Q V	.	.	.	.	.
9.583	290.6911	464.64	.	Q V	.	.	.	.	.
9.667	293.9040	466.52	.	Q V	.	.	.	.	.
9.750	297.1301	468.43	.	Q V	.	.	.	.	.
9.833	300.3696	470.37	.	Q V	.	.	.	.	.
9.917	303.6227	472.35	.	Q V	.	.	.	.	.
10.000	306.8896	474.35	.	Q V	.	.	.	.	.
10.083	310.1705	476.39	.	Q .V	.	.	.	.	.
10.167	313.4657	478.46	.	Q .V	.	.	.	.	.
10.250	316.7755	480.58	.	Q .V	.	.	.	.	.
10.333	320.1000	482.72	.	Q .V	.	.	.	.	.
10.417	323.4396	484.91	.	Q .V	.	.	.	.	.
10.500	326.7945	487.13	.	Q .V	.	.	.	.	.
10.583	330.1650	489.40	.	Q .V	.	.	.	.	.
10.667	333.5514	491.70	.	Q .V	.	.	.	.	.
10.750	336.9539	494.05	.	Q .V	.	.	.	.	.
10.833	340.3730	496.45	.	Q . V	.	.	.	.	.
10.917	343.8089	498.89	.	Q . V	.	.	.	.	.
11.000	347.2619	501.37	.	Q . V	.	.	.	.	.
11.083	350.7324	503.91	.	Q . V	.	.	.	.	.
11.167	354.2206	506.50	.	Q . V	.	.	.	.	.
11.250	357.7271	509.14	.	Q . V	.	.	.	.	.
11.333	361.2522	511.84	.	Q . V	.	.	.	.	.
11.417	364.7962	514.59	.	Q . V	.	.	.	.	.
11.500	368.3596	517.40	.	Q . V	.	.	.	.	.
11.583	371.9428	520.28	.	Q . V	.	.	.	.	.
11.667	375.5462	523.21	.	Q . V	.	.	.	.	.
11.750	379.1703	526.22	.	Q . V	.	.	.	.	.
11.833	382.8156	529.29	.	Q . V	.	.	.	.	.
11.917	386.4825	532.44	.	Q . V	.	.	.	.	.
12.000	390.1715	535.65	.	Q . V	.	.	.	.	.
12.083	393.8730	537.46	.	Q . V	.	.	.	.	.
12.167	397.5727	537.20	.	Q . V	.	.	.	.	.
12.250	401.2543	534.56	.	Q . V	.	.	.	.	.
12.333	404.8939	528.48	.	Q . V	.	.	.	.	.
12.417	408.4725	519.61	.	Q . V	.	.	.	.	.
12.500	411.9790	509.14	.	Q . V	.	.	.	.	.
12.583	415.4057	497.55	.	Q . V	.	.	.	.	.
12.667	418.7589	486.89	.	Q . V	.	.	.	.	.
12.750	422.0590	479.17	.	Q . V	.	.	.	.	.
12.833	425.3267	474.47	.	Q . V	.	.	.	.	.
12.917	428.5780	472.09	.	Q . V	.	.	.	.	.
13.000	431.8250	471.46	.	Q . V	.	.	.	.	.
13.083	435.0784	472.38	.	Q . V	.	.	.	.	.
13.167	438.3446	474.25	.	Q . V	.	.	.	.	.
13.250	441.6295	476.96	.	Q . V	.	.	.	.	.
13.333	444.9386	480.49	.	Q . V	.	.	.	.	.
13.417	448.2755	484.52	.	Q . V	.	.	.	.	.
13.500	451.6456	489.33	.	Q . V	.	.	.	.	.
13.583	455.0512	494.50	.	Q . V	.	.	.	.	.

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13.667   458.4951   500.05  .    Q   .    V   .        .        .
13.750   461.9798   505.98  .    Q   .    V   .        .        .
13.833   465.5082   512.33  .    Q   .    V   .        .        .
13.917   469.0831   519.07  .    Q   .    V   .        .        .
14.000   472.7068   526.16  .     Q  .    V   .        .        .
14.083   476.3960   535.66  .     Q  .    V   .        .        .
14.167   480.1717   548.23  .     Q  .     V  .        .        .
14.250   484.0576   564.24  .     Q  .     V  .        .        .
14.333   488.0867   585.03  .     Q  .     V  .        .        .
14.417   492.2868   609.85  .      Q .     V  .        .        .
14.500   496.6756   637.25  .      Q .     V  .        .        .
14.583   501.2676   666.77  .      Q .     V  .        .        .
14.667   506.0609   695.99  .       Q.     V  .        .        .
14.750   511.0375   722.59  .       Q.      V .        .        .
14.833   516.1786   746.49  .       Q.      V .        .        .
14.917   521.4728   768.71  .        Q      V .        .        .
15.000   526.9136   790.00  .        Q      V .        .        .
15.083   532.4984   810.91  .        Q      V .        .        .
15.167   538.2294   832.15  .        .Q      V.        .        .
15.250   544.1121   854.17  .        .Q      V.        .        .
15.333   550.1531   877.16  .        .Q      V.        .        .
15.417   556.3331   897.33  .        .Q      V.        .        .
15.500   562.6187   912.67  .        . Q      V        .        .
15.583   568.9791   923.53  .        . Q      V        .        .
15.667   575.3658   927.35  .        . Q      V        .        .
15.750   581.7625   928.79  .        . Q      V        .        .
15.833   588.1931   933.74  .        . Q      V        .        .
15.917   594.7360   950.02  .        . Q      .V       .        .
16.000   601.6459  1003.33  .        .  Q     .V       .        .
16.083   610.1028  1227.94  .        .    Q   .V       .        .
16.167   620.6995  1538.64  .        .        Q V      .        .
16.250   633.7637  1896.93  .        .         . V  Q  .        .
16.333   649.8599  2337.16  .        .         .  V     .Q      .
16.417   668.3397  2683.27  .        .         .  V     .   Q   .
16.500   688.1893  2882.16  .        .         .   V    .      Q .
16.583   708.6994  2978.07  .        .         .    V   .       Q.
16.667   728.2141  2833.54  .        .         .    V   .     Q  .
16.750   745.3422  2486.99  .        .         .     V  .  Q     .
16.833   760.0594  2136.94  .        .         .      VQ .       .
16.917   772.9265  1868.30  .        .         .   Q  V  .       .
17.000   784.3654  1660.93  .        .         . Q    V  .       .
17.083   794.5795  1483.10  .        .        Q.      V .        .
17.167   803.9396  1359.07  .        .      Q .       V .        .
17.250   812.5391  1248.65  .        .    Q   .       V .        .
17.333   820.3956  1140.76  .        .   Q    .        V.        .
17.417   827.7024  1060.94  .        .  Q     .        V.        .
17.500   834.3340   962.92  .        . Q      .        V.        .
17.583   840.5834   907.40  .        . Q      .        V.        .
17.667   846.4615   853.50  .        .Q       .         V        .
17.750   852.0296   808.49  .        Q        .         V        .
17.833   857.2975   764.90  .        Q        .         V        .
17.917   862.3400   732.17  .       Q.        .         V        .
18.000   867.1955   705.02  .       Q.        .         V        .
18.083   871.7693   664.13  .      Q .        .         V        .
18.167   876.1624   637.87  .      Q .        .         .V       .
18.250   880.4669   625.02  .      Q .        .         .V       .
18.333   884.6804   611.79  .      Q .        .         .V       .
18.417   888.8514   605.64  .      Q .        .         .V       .
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18.500   893.0282   606.46  .       Q .        .        .V       .
18.583   897.2175   608.28  .       Q .        .        .V       .
18.667   901.3831   604.85  .       Q .        .        . V      .
18.750   905.5431   604.04  .       Q .        .        . V      .
18.833   909.6951   602.86  .       Q .        .        . V      .
18.917   913.8244   599.58  .      Q  .        .        . V      .
19.000   917.9033   592.26  .      Q  .        .        . V      .
19.083   921.8927   579.26  .      Q  .        .        . V      .
19.167   925.8447   573.82  .      Q  .        .        . V      .
19.250   929.7632   568.97  .      Q  .        .        .  V     .
19.333   933.6459   563.77  .      Q  .        .        .  V     .
19.417   937.4898   558.13  .      Q  .        .        .  V     .
19.500   941.2889   551.63  .      Q  .        .        .  V     .
19.583   945.0256   542.57  .      Q  .        .        .  V     .
19.667   948.6481   525.98  .      Q  .        .        .  V     .
19.750   952.2195   518.57  .     Q   .        .        .  V     .
19.833   955.7568   513.61  .     Q   .        .        .  V     .
19.917   959.2625   509.04  .     Q   .        .        .   V    .
20.000   962.7363   504.40  .     Q   .        .        .   V    .
20.083   966.1789   499.86  .     Q   .        .        .   V    .
20.167   969.5911   495.45  .     Q   .        .        .   V    .
20.250   972.9738   491.17  .     Q   .        .        .   V    .
20.333   976.3278   486.99  .     Q   .        .        .   V    .
20.417   979.6535   482.89  .     Q   .        .        .   V    .
20.500   982.9518   478.92  .     Q   .        .        .   V    .
20.583   986.2247   475.21  .     Q   .        .        .    V   .
20.667   989.4738   471.77  .     Q   .        .        .    V   .
20.750   992.6998   468.41  .     Q   .        .        .    V   .
20.833   995.9029   465.09  .     Q   .        .        .    V   .
20.917   999.0831   461.76  .     Q   .        .        .    V   .
21.000  1002.2399   458.37  .     Q   .        .        .    V   .
21.083  1005.3718   454.74  .     Q   .        .        .    V   .
21.167  1008.4742   450.48  .     Q   .        .        .    V   .
21.250  1011.5172   441.83  .    Q    .        .        .    V   .
21.333  1014.5125   434.92  .    Q    .        .        .     V  .
21.417  1017.4867   431.86  .    Q    .        .        .     V  .
21.500  1020.4418   429.08  .    Q    .        .        .     V  .
21.583  1023.3777   426.30  .    Q    .        .        .     V  .
21.667  1026.2939   423.42  .    Q    .        .        .     V  .
21.750  1029.1908   420.63  .    Q    .        .        .     V  .
21.833  1032.0691   417.93  .    Q    .        .        .     V  .
21.917  1034.9293   415.31  .    Q    .        .        .     V  .
22.000  1037.7720   412.76  .    Q    .        .        .     V  .
22.083  1040.5977   410.29  .    Q    .        .        .     V  .
22.167  1043.4067   407.88  .    Q    .        .        .      V .
22.250  1046.2001   405.59  .    Q    .        .        .      V .
22.333  1048.9784   403.40  .    Q    .        .        .      V .
22.417  1051.7419   401.27  .    Q    .        .        .      V .
22.500  1054.4912   399.19  .    Q    .        .        .      V .
22.583  1057.2266   397.17  .    Q    .        .        .      V .
22.667  1059.9482   395.19  .    Q    .        .        .      V .
22.750  1062.6566   393.25  .    Q    .        .        .      V .
22.833  1065.3519   391.36  .    Q    .        .        .      V .
22.917  1068.0344   389.50  .    Q    .        .        .      V .
23.000  1070.7045   387.69  .    Q    .        .        .       V.
23.083  1073.3623   385.92  .    Q    .        .        .       V.
23.167  1076.0082   384.18  .    Q    .        .        .       V.
23.250  1078.6420   382.43  .    Q    .        .        .       V.
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23.333	1081.2637	380.67	. Q	.	.	.	V	.
23.417	1083.8735	378.95	. Q	.	.	.	V	.
23.500	1086.4717	377.26	. Q	.	.	.	V	.
23.583	1089.0583	375.59	. Q	.	.	.	V	.
23.667	1091.6338	373.96	. Q	.	.	.	V	.
23.750	1094.1982	372.35	. Q	.	.	.	V	.
23.833	1096.7518	370.78	. Q	.	.	.	V	.
23.917	1099.2947	369.22	. Q	.	.	.	V.	
24.000	1101.8270	367.70	. Q	.	.	.	V.	
24.083	1104.3236	362.50	. Q	.	.	.	V.	
24.167	1106.7480	352.03	. Q	.	.	.	V.	
24.250	1109.0586	335.50	. Q	.	.	.	V.	
24.333	1111.1952	310.24	. Q	.	.	.	V.	
24.417	1113.1091	277.91	. Q	.	.	.	V.	
24.500	1114.7716	241.39	. Q	.	.	.	V.	
24.583	1116.1616	201.84	. Q	.	.	.	V.	
24.667	1117.2936	164.37	. Q	.	.	.	V.	
24.750	1118.2155	133.86	.Q	.	.	.	V.	
24.833	1118.9767	110.53	.Q	.	.	.	V.	
24.917	1119.6141	92.55	.Q	.	.	.	V.	
25.000	1120.1553	78.57	.Q	.	.	.	V.	
25.083	1120.6234	67.98	Q	.	.	.	V.	
25.167	1121.0321	59.34	Q	.	.	.	V.	
25.250	1121.3922	52.28	Q	.	.	.	V.	
25.333	1121.7142	46.76	Q	.	.	.	V.	
25.417	1122.0032	41.95	Q	.	.	.	V.	
25.500	1122.2683	38.50	Q	.	.	.	V.	
25.583	1122.5115	35.30	Q	.	.	.	V.	
25.667	1122.7347	32.41	Q	.	.	.	V.	
25.750	1122.9396	29.74	Q	.	.	.	V.	
25.833	1123.1279	27.36	Q	.	.	.	V.	
25.917	1123.3008	25.10	Q	.	.	.	V.	
26.000	1123.4581	22.84	Q	.	.	.	V.	
26.083	1123.6034	21.10	Q	.	.	.	V.	
26.167	1123.7384	19.61	Q	.	.	.	V.	
26.250	1123.8633	18.13	Q	.	.	.	V.	
26.333	1123.9792	16.84	Q	.	.	.	V.	
26.417	1124.0870	15.65	Q	.	.	.	V.	
26.500	1124.1868	14.47	Q	.	.	.	V.	
26.583	1124.2784	13.32	Q	.	.	.	V.	
26.667	1124.3634	12.33	Q	.	.	.	V.	
26.750	1124.4419	11.40	Q	.	.	.	V.	
26.833	1124.5139	10.46	Q	.	.	.	V.	
26.917	1124.5796	9.54	Q	.	.	.	V.	
27.000	1124.6393	8.68	Q	.	.	.	V.	
27.083	1124.6946	8.04	Q	.	.	.	V.	
27.167	1124.7457	7.42	Q	.	.	.	V.	
27.250	1124.7926	6.81	Q	.	.	.	V.	
27.333	1124.8352	6.19	Q	.	.	.	V.	
27.417	1124.8737	5.59	Q	.	.	.	V.	
27.500	1124.9080	4.98	Q	.	.	.	V.	
27.583	1124.9384	4.42	Q	.	.	.	V.	
27.667	1124.9668	4.13	Q	.	.	.	V.	
27.750	1124.9937	3.90	Q	.	.	.	V.	
27.833	1125.0189	3.67	Q	.	.	.	V.	
27.917	1125.0426	3.44	Q	.	.	.	V.	
28.000	1125.0647	3.21	Q	.	.	.	V.	
28.083	1125.0852	2.98	Q	.	.	.	V.	

28.167	1125.1041	2.75	Q	.	.	.	V.	
28.250	1125.1215	2.53	Q	.	.	.	V.	
28.333	1125.1373	2.30	Q	.	.	.	V.	
28.417	1125.1516	2.08	Q	.	.	.	V.	
28.500	1125.1643	1.85	Q	.	.	.	V.	
28.583	1125.1755	1.63	Q	.	.	.	V.	
28.667	1125.1852	1.41	Q	.	.	.	V.	
28.750	1125.1934	1.19	Q	.	.	.	V.	
28.833	1125.2000	0.97	Q	.	.	.	V.	
28.917	1125.2051	0.75	Q	.	.	.	V.	
29.000	1125.2087	0.53	Q	.	.	.	V.	
29.083	1125.2108	0.31	Q	.	.	.	V.	
29.167	1125.2114	0.09	Q	.	.	.	V.	

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1750.0
10%	1395.0
20%	275.0
30%	135.0
40%	75.0
50%	55.0
60%	45.0
70%	35.0
80%	25.0
90%	20.0

****
FLOW PROCESS FROM NODE 353.00 TO NODE 353.00 IS CODE = 11
>>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<

STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 750.0 1500.0 2250.0 3000.0
0.083	0.0255	3.70	Q . . . .
0.167	0.1131	12.72	Q . . . .
0.250	0.3052	27.89	Q . . . .
0.333	0.6625	51.88	Q . . . .
0.417	1.2349	83.11	VQ . . . .
0.500	2.0525	118.72	VQ . . . .
0.583	3.1377	157.57	V Q . . . .
0.667	4.4777	194.57	V Q . . . .
0.750	6.0259	224.80	V Q . . . .
0.833	7.7341	248.03	V Q . . . .
0.917	9.5662	266.03	V Q . . . .
1.000	11.4955	280.13	V Q . . . .
1.083	13.4992	290.93	V Q . . . .
1.167	15.5642	299.84	V Q . . . .

1.250	17.6800	307.22	V	Q	.	.	.	.
1.333	19.8364	313.10	V	Q	.	.	.	.
1.417	22.0287	318.32	V	Q	.	.	.	.
1.500	24.2477	322.20	V	Q	.	.	.	.
1.583	26.4919	325.86	V	Q	.	.	.	.
1.667	28.7593	329.22	.V	Q	.	.	.	.
1.750	31.0486	332.40	.V	Q	.	.	.	.
1.833	33.3578	335.31	.V	Q	.	.	.	.
1.917	35.6864	338.11	.V	Q	.	.	.	.
2.000	38.0344	340.92	.V	Q	.	.	.	.
2.083	40.3983	343.25	.V	Q	.	.	.	.
2.167	42.7766	345.33	.V	Q	.	.	.	.
2.250	45.1693	347.42	.V	Q	.	.	.	.
2.333	47.5751	349.33	.V	Q	.	.	.	.
2.417	49.9936	351.15	.V	Q	.	.	.	.
2.500	52.4246	352.98	.V	Q	.	.	.	.
2.583	54.8681	354.80	.V	Q	.	.	.	.
2.667	57.3230	356.46	. V	Q	.	.	.	.
2.750	59.7891	358.08	. V	Q	.	.	.	.
2.833	62.2664	359.70	. V	Q	.	.	.	.
2.917	64.7550	361.34	. V	Q	.	.	.	.
3.000	67.2544	362.92	. V	Q	.	.	.	.
3.083	69.7633	364.29	. V	Q	.	.	.	.
3.167	72.2815	365.65	. V	Q	.	.	.	.
3.250	74.8092	367.01	. V	Q	.	.	.	.
3.333	77.3463	368.38	. V	Q	.	.	.	.
3.417	79.8928	369.76	. V	Q	.	.	.	.
3.500	82.4490	371.15	. V	Q	.	.	.	.
3.583	85.0144	372.51	.	VQ	.	.	.	.
3.667	87.5874	373.59	.	VQ	.	.	.	.
3.750	90.1675	374.63	.	VQ	.	.	.	.
3.833	92.7549	375.68	.	V Q	.	.	.	.
3.917	95.3495	376.74	.	V Q	.	.	.	.
4.000	97.9515	377.81	.	V Q	.	.	.	.
4.083	100.5609	378.88	.	V Q	.	.	.	.
4.167	103.1777	379.96	.	V Q	.	.	.	.
4.250	105.8021	381.05	.	V Q	.	.	.	.
4.333	108.4339	382.15	.	V Q	.	.	.	.
4.417	111.0735	383.26	.	V Q	.	.	.	.
4.500	113.7206	384.37	.	VQ	.	.	.	.
4.583	116.3756	385.49	.	VQ	.	.	.	.
4.667	119.0383	386.63	.	VQ	.	.	.	.
4.750	121.7088	387.77	.	VQ	.	.	.	.
4.833	124.3873	388.92	.	VQ	.	.	.	.
4.917	127.0738	390.08	.	VQ	.	.	.	.
5.000	129.7683	391.24	.	VQ	.	.	.	.
5.083	132.4710	392.42	.	VQ	.	.	.	.
5.167	135.1818	393.61	.	VQ	.	.	.	.
5.250	137.9000	394.69	.	VQ	.	.	.	.
5.333	140.6251	395.68	.	VQ	.	.	.	.
5.417	143.3570	396.68	.	Q	.	.	.	.
5.500	146.0959	397.69	.	Q	.	.	.	.
5.583	148.8419	398.71	.	Q	.	.	.	.
5.667	151.5949	399.74	.	Q	.	.	.	.
5.750	154.3552	400.79	.	Q	.	.	.	.
5.833	157.1226	401.84	.	Q	.	.	.	.
5.917	159.8974	402.90	.	Q	.	.	.	.
6.000	162.6796	403.98	.	Q	.	.	.	.

6.083	165.4693	405.06	.	Q	.	.	.	.
6.167	168.2666	406.16	.	Q	.	.	.	.
6.250	171.0715	407.27	.	QV	.	.	.	.
6.333	173.8840	408.39	.	QV	.	.	.	.
6.417	176.7045	409.52	.	QV	.	.	.	.
6.500	179.5327	410.67	.	QV	.	.	.	.
6.583	182.3690	411.83	.	QV	.	.	.	.
6.667	185.2133	413.00	.	QV	.	.	.	.
6.750	188.0658	414.18	.	QV	.	.	.	.
6.833	190.9266	415.38	.	QV	.	.	.	.
6.917	193.7957	416.59	.	QV	.	.	.	.
7.000	196.6732	417.81	.	QV	.	.	.	.
7.083	199.5592	419.05	.	Q V	.	.	.	.
7.167	202.4539	420.31	.	Q V	.	.	.	.
7.250	205.3573	421.58	.	Q V	.	.	.	.
7.333	208.2696	422.86	.	Q V	.	.	.	.
7.417	211.1908	424.16	.	Q V	.	.	.	.
7.500	214.1210	425.47	.	Q V	.	.	.	.
7.583	217.0605	426.80	.	Q V	.	.	.	.
7.667	220.0091	428.15	.	Q V	.	.	.	.
7.750	222.9672	429.51	.	Q V	.	.	.	.
7.833	225.9348	430.89	.	Q	V	.	.	.
7.917	228.9120	432.29	.	Q	V	.	.	.
8.000	231.8990	433.71	.	Q	V	.	.	.
8.083	234.8958	435.14	.	Q	V	.	.	.
8.167	237.9027	436.59	.	Q	V	.	.	.
8.250	240.9197	438.07	.	Q	V	.	.	.
8.333	243.9469	439.56	.	Q	V	.	.	.
8.417	246.9846	441.07	.	Q	V	.	.	.
8.500	250.0328	442.60	.	Q	V	.	.	.
8.583	253.0917	444.16	.	Q	V	.	.	.
8.667	256.1615	445.73	.	Q	V.	.	.	.
8.750	259.2423	447.33	.	Q	V.	.	.	.
8.833	262.3342	448.95	.	Q	V.	.	.	.
8.917	265.4374	450.59	.	Q	V.	.	.	.
9.000	268.5522	452.25	.	Q	V.	.	.	.
9.083	271.6785	453.95	.	Q	V.	.	.	.
9.167	274.8167	455.66	.	Q	V.	.	.	.
9.250	277.9668	457.40	.	Q	V.	.	.	.
9.333	281.1292	459.17	.	Q	V.	.	.	.
9.417	284.3038	460.97	.	Q	V	.	.	.
9.500	287.4911	462.79	.	Q	V	.	.	.
9.583	290.6911	464.64	.	Q	V	.	.	.
9.667	293.9040	466.52	.	Q	V	.	.	.
9.750	297.1301	468.43	.	Q	V	.	.	.
9.833	300.3696	470.37	.	Q	V	.	.	.
9.917	303.6227	472.35	.	Q	V	.	.	.
10.000	306.8896	474.35	.	Q	V	.	.	.
10.083	310.1705	476.39	.	Q	.V	.	.	.
10.167	313.4657	478.46	.	Q	.V	.	.	.
10.250	316.7755	480.58	.	Q	.V	.	.	.
10.333	320.1000	482.72	.	Q	.V	.	.	.
10.417	323.4396	484.91	.	Q	.V	.	.	.
10.500	326.7945	487.13	.	Q	.V	.	.	.
10.583	330.1650	489.40	.	Q	.V	.	.	.
10.667	333.5514	491.70	.	Q	.V	.	.	.
10.750	336.9539	494.05	.	Q	.V	.	.	.
10.833	340.3730	496.45	.	Q	. V	.	.	.

10.917	343.8089	498.89	. Q . V . . .
11.000	347.2619	501.37	. Q . V . . .
11.083	350.7324	503.91	. Q . V . . .
11.167	354.2206	506.50	. Q . V . . .
11.250	357.7271	509.14	. Q . V . . .
11.333	361.2522	511.84	. Q . V . . .
11.417	364.7962	514.59	. Q . V . . .
11.500	368.3596	517.40	. Q . V . . .
11.583	371.9428	520.28	. Q . V . . .
11.667	375.5462	523.21	. Q . V . . .
11.750	379.1703	526.22	. Q . V . . .
11.833	382.8156	529.29	. Q . V . . .
11.917	386.4825	532.44	. Q . V . . .
12.000	390.1715	535.65	. Q . V . . .
12.083	393.8730	537.46	. Q . V . . .
12.167	397.5727	537.20	. Q . V . . .
12.250	401.2543	534.56	. Q . V . . .
12.333	404.8939	528.48	. Q . V . . .
12.417	408.4725	519.61	. Q . V . . .
12.500	411.9790	509.14	. Q . V . . .
12.583	415.4057	497.55	. Q . V . . .
12.667	418.7589	486.89	. Q . V . . .
12.750	422.0590	479.17	. Q . V . . .
12.833	425.3267	474.47	. Q . V . . .
12.917	428.5780	472.09	. Q . V . . .
13.000	431.8250	471.46	. Q . V . . .
13.083	435.0784	472.38	. Q . V . . .
13.167	438.3446	474.25	. Q . V . . .
13.250	441.6295	476.96	. Q . V . . .
13.333	444.9386	480.49	. Q . V . . .
13.417	448.2755	484.52	. Q . V . . .
13.500	451.6456	489.33	. Q . V . . .
13.583	455.0512	494.50	. Q . V . . .
13.667	458.4951	500.05	. Q . V . . .
13.750	461.9798	505.98	. Q . V . . .
13.833	465.5082	512.33	. Q . V . . .
13.917	469.0831	519.07	. Q . V . . .
14.000	472.7068	526.16	. Q . V . . .
14.083	476.3960	535.66	. Q . V . . .
14.167	480.1717	548.23	. Q . V . . .
14.250	484.0576	564.24	. Q . V . . .
14.333	488.0867	585.03	. Q . V . . .
14.417	492.2868	609.85	. Q . V . . .
14.500	496.6756	637.25	. Q . V . . .
14.583	501.2676	666.77	. Q . V . . .
14.667	506.0609	695.99	. Q . V . . .
14.750	511.0375	722.59	. Q . V . . .
14.833	516.1786	746.49	. Q . V . . .
14.917	521.4728	768.71	. Q . V . . .
15.000	526.9136	790.00	. Q . V . . .
15.083	532.4984	810.91	. Q . V . . .
15.167	538.2294	832.15	. .Q . V. . .
15.250	544.1121	854.17	. .Q . V. . .
15.333	550.1531	877.16	. .Q . V. . .
15.417	556.3331	897.33	. .Q . V. . .
15.500	562.6187	912.67	. . Q . V . .
15.583	568.9791	923.53	. . Q . V . .
15.667	575.3658	927.35	. . Q . V . .

15.750	581.7625	928.79	. . Q . V . .
15.833	588.1931	933.74	. . Q . V . .
15.917	594.7360	950.02	. . Q . .V . .
16.000	601.6459	1003.33	. . Q . .V . .
16.083	610.1028	1227.94	. . Q . .V . .
16.167	620.6995	1538.64	. . Q V . . .
16.250	633.7637	1896.93	. . . V Q . .
16.333	649.8599	2337.16	. . . V . Q .
16.417	668.3397	2683.27	. . . V . . Q .
16.500	688.1893	2882.16	. . . V . . Q .
16.583	708.6994	2978.07	. . . V . . Q.
16.667	728.2141	2833.54	. . . V . . Q .
16.750	745.3422	2486.99	. . . V . Q .
16.833	760.0594	2136.94	. . . VQ . .
16.917	772.9265	1868.30	. . . Q V . .
17.000	784.3654	1660.93	. . . Q V . .
17.083	794.5795	1483.10	. . Q. V . .
17.167	803.9396	1359.07	. . Q . V . .
17.250	812.5391	1248.65	. . Q . V . .
17.333	820.3956	1140.76	. . Q . V. .
17.417	827.7024	1060.94	. . Q . V. .
17.500	834.3340	962.92	. . Q . V. .
17.583	840.5834	907.40	. . Q . V. .
17.667	846.4615	853.50	. .Q . V .
17.750	852.0296	808.49	. Q . V .
17.833	857.2975	764.90	. Q . V .
17.917	862.3400	732.17	. Q. . V .
18.000	867.1955	705.02	. Q. . V .
18.083	871.7693	664.13	. Q . . V .
18.167	876.1624	637.87	. Q . . .V .
18.250	880.4669	625.02	. Q . . .V .
18.333	884.6804	611.79	. Q . . .V .
18.417	888.8514	605.64	. Q . . .V .
18.500	893.0282	606.46	. Q . . .V .
18.583	897.2175	608.28	. Q . . .V .
18.667	901.3831	604.85	. Q . . . V .
18.750	905.5431	604.04	. Q . . . V .
18.833	909.6951	602.86	. Q . . . V .
18.917	913.8244	599.58	. Q . . . V .
19.000	917.9033	592.26	. Q . . . V .
19.083	921.8927	579.26	. Q . . . V .
19.167	925.8447	573.82	. Q . . . V .
19.250	929.7632	568.97	. Q . . . . V .
19.333	933.6459	563.77	. Q . . . . V .
19.417	937.4898	558.13	. Q . . . . V .
19.500	941.2889	551.63	. Q . . . . V .
19.583	945.0256	542.57	. Q . . . . V .
19.667	948.6481	525.98	. Q . . . . V .
19.750	952.2195	518.57	. Q . . . . V .
19.833	955.7568	513.61	. Q . . . . V .
19.917	959.2625	509.04	. Q . . . . V .
20.000	962.7363	504.40	. Q . . . . V .
20.083	966.1789	499.86	. Q . . . . V .
20.167	969.5911	495.45	. Q . . . . V .
20.250	972.9738	491.17	. Q . . . . V .
20.333	976.3278	486.99	. Q . . . . V .
20.417	979.6535	482.89	. Q . . . . V .
20.500	982.9518	478.92	. Q . . . . V .

20.583	986.2247	475.21	.	Q	.	.	.	V	.
20.667	989.4738	471.77	.	Q	.	.	.	V	.
20.750	992.6998	468.41	.	Q	.	.	.	V	.
20.833	995.9029	465.09	.	Q	.	.	.	V	.
20.917	999.0831	461.76	.	Q	.	.	.	V	.
21.000	1002.2399	458.37	.	Q	.	.	.	V	.
21.083	1005.3718	454.74	.	Q	.	.	.	V	.
21.167	1008.4742	450.48	.	Q	.	.	.	V	.
21.250	1011.5172	441.83	.	Q	.	.	.	V	.
21.333	1014.5125	434.92	.	Q	.	.	.	V	.
21.417	1017.4867	431.86	.	Q	.	.	.	V	.
21.500	1020.4418	429.08	.	Q	.	.	.	V	.
21.583	1023.3777	426.30	.	Q	.	.	.	V	.
21.667	1026.2939	423.42	.	Q	.	.	.	V	.
21.750	1029.1908	420.63	.	Q	.	.	.	V	.
21.833	1032.0691	417.93	.	Q	.	.	.	V	.
21.917	1034.9293	415.31	.	Q	.	.	.	V	.
22.000	1037.7720	412.76	.	Q	.	.	.	V	.
22.083	1040.5977	410.29	.	Q	.	.	.	V	.
22.167	1043.4067	407.88	.	Q	.	.	.	V	.
22.250	1046.2001	405.59	.	Q	.	.	.	V	.
22.333	1048.9784	403.40	.	Q	.	.	.	V	.
22.417	1051.7419	401.27	.	Q	.	.	.	V	.
22.500	1054.4912	399.19	.	Q	.	.	.	V	.
22.583	1057.2266	397.17	.	Q	.	.	.	V	.
22.667	1059.9482	395.19	.	Q	.	.	.	V	.
22.750	1062.6566	393.25	.	Q	.	.	.	V	.
22.833	1065.3519	391.36	.	Q	.	.	.	V	.
22.917	1068.0344	389.50	.	Q	.	.	.	V	.
23.000	1070.7045	387.69	.	Q	.	.	.	V	.
23.083	1073.3623	385.92	.	Q	.	.	.	V	.
23.167	1076.0082	384.18	.	Q	.	.	.	V	.
23.250	1078.6420	382.43	.	Q	.	.	.	V	.
23.333	1081.2637	380.67	.	Q	.	.	.	V	.
23.417	1083.8735	378.95	.	Q	.	.	.	V	.
23.500	1086.4717	377.26	.	Q	.	.	.	V	.
23.583	1089.0583	375.59	.	Q	.	.	.	V	.
23.667	1091.6338	373.96	.	Q	.	.	.	V	.
23.750	1094.1982	372.35	.	Q	.	.	.	V	.
23.833	1096.7518	370.78	.	Q	.	.	.	V	.
23.917	1099.2947	369.22	.	Q	.	.	.	V	.
24.000	1101.8270	367.70	.	Q	.	.	.	V	.
24.083	1104.3236	362.50	.	Q	.	.	.	V	.
24.167	1106.7480	352.03	.	Q	.	.	.	V	.
24.250	1109.0586	335.50	.	Q	.	.	.	V	.
24.333	1111.1952	310.24	.	Q	.	.	.	V	.
24.417	1113.1091	277.91	.	Q	.	.	.	V	.
24.500	1114.7716	241.39	.	Q	.	.	.	V	.
24.583	1116.1616	201.84	.	Q	.	.	.	V	.
24.667	1117.2936	164.37	.	Q	.	.	.	V	.
24.750	1118.2155	133.86	.	Q	.	.	.	V	.
24.833	1118.9767	110.53	.	Q	.	.	.	V	.
24.917	1119.6141	92.55	.	Q	.	.	.	V	.
25.000	1120.1553	78.57	.	Q	.	.	.	V	.
25.083	1120.6234	67.98	Q	.	.	.	.	V	.
25.167	1121.0321	59.34	Q	.	.	.	.	V	.
25.250	1121.3922	52.28	Q	.	.	.	.	V	.
25.333	1121.7142	46.76	Q	.	.	.	.	V	.

25.417	1122.0032	41.95	Q	.	.	.	.	V	.
25.500	1122.2683	38.50	Q	.	.	.	.	V	.
25.583	1122.5115	35.30	Q	.	.	.	.	V	.
25.667	1122.7347	32.41	Q	.	.	.	.	V	.
25.750	1122.9396	29.74	Q	.	.	.	.	V	.
25.833	1123.1279	27.36	Q	.	.	.	.	V	.
25.917	1123.3008	25.10	Q	.	.	.	.	V	.
26.000	1123.4581	22.84	Q	.	.	.	.	V	.
26.083	1123.6034	21.10	Q	.	.	.	.	V	.
26.167	1123.7384	19.61	Q	.	.	.	.	V	.
26.250	1123.8633	18.13	Q	.	.	.	.	V	.
26.333	1123.9792	16.84	Q	.	.	.	.	V	.
26.417	1124.0870	15.65	Q	.	.	.	.	V	.
26.500	1124.1868	14.47	Q	.	.	.	.	V	.
26.583	1124.2784	13.32	Q	.	.	.	.	V	.
26.667	1124.3634	12.33	Q	.	.	.	.	V	.
26.750	1124.4419	11.40	Q	.	.	.	.	V	.
26.833	1124.5139	10.46	Q	.	.	.	.	V	.
26.917	1124.5796	9.54	Q	.	.	.	.	V	.
27.000	1124.6393	8.68	Q	.	.	.	.	V	.
27.083	1124.6946	8.04	Q	.	.	.	.	V	.
27.167	1124.7457	7.42	Q	.	.	.	.	V	.
27.250	1124.7926	6.81	Q	.	.	.	.	V	.
27.333	1124.8352	6.19	Q	.	.	.	.	V	.
27.417	1124.8737	5.59	Q	.	.	.	.	V	.
27.500	1124.9080	4.98	Q	.	.	.	.	V	.
27.583	1124.9384	4.42	Q	.	.	.	.	V	.
27.667	1124.9668	4.13	Q	.	.	.	.	V	.
27.750	1124.9937	3.90	Q	.	.	.	.	V	.
27.833	1125.0189	3.67	Q	.	.	.	.	V	.
27.917	1125.0426	3.44	Q	.	.	.	.	V	.
28.000	1125.0647	3.21	Q	.	.	.	.	V	.
28.083	1125.0852	2.98	Q	.	.	.	.	V	.
28.167	1125.1041	2.75	Q	.	.	.	.	V	.
28.250	1125.1215	2.53	Q	.	.	.	.	V	.
28.333	1125.1373	2.30	Q	.	.	.	.	V	.
28.417	1125.1516	2.08	Q	.	.	.	.	V	.
28.500	1125.1643	1.85	Q	.	.	.	.	V	.
28.583	1125.1755	1.63	Q	.	.	.	.	V	.
28.667	1125.1852	1.41	Q	.	.	.	.	V	.
28.750	1125.1934	1.19	Q	.	.	.	.	V	.
28.833	1125.2000	0.97	Q	.	.	.	.	V	.
28.917	1125.2051	0.75	Q	.	.	.	.	V	.
29.000	1125.2087	0.53	Q	.	.	.	.	V	.
29.083	1125.2108	0.31	Q	.	.	.	.	V	.
29.167	1125.2114	0.09	Q	.	.	.	.	V	.
29.250	1125.2114	0.00	Q	.	.	.	.	V	.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1750.0
10%	1395.0
20%	275.0

30%	135.0
40%	75.0
50%	55.0
60%	45.0
70%	35.0
80%	25.0
90%	20.0

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END OF FLOODSCx ROUTING ANALYSIS

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            F L O O D   R O U T I N G   A N A L Y S I S
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                        Analysis prepared by:

                            RBF Consulting
                         14257 Alton Parkway
                              Irvine, CA
                                92618

 ************************* DESCRIPTION OF STUDY *************************
* Opal Basin Routing W/O Crafton Basin                                  *
* Opal Basin Feasibility Study - With Revised N Values                  *
* Node 20353 AMC-II                                                     *
 ************************************************************************

  FILE NAME: 353B.DAT
  TIME/DATE OF STUDY: 11:07 04/01/2014


**************************************************************************
  FLOW PROCESS FROM NODE    353.00 TO NODE    353.00 IS CODE =   1
--------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
==========================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =    4029.500 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.580 HOURS
         VALLEY(DEVELOPED):
                  "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.406
         FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.000
         MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.000
         VALLEY(UNDEVELOPED)/DESERT:
                  "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.594
         DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.000
         MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) =  0.580
         LOW LOSS FRACTION = 0.540
         *HYDROGRAPH MODEL #1 SPECIFIED*

         SPECIFIED PEAK  5-MINUTES RAINFALL(INCH)=  0.45
         SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)=  0.93
         SPECIFIED PEAK  1-HOUR RAINFALL(INCH) =  1.22
         SPECIFIED PEAK  3-HOUR RAINFALL(INCH) =  2.05
         SPECIFIED PEAK  6-HOUR RAINFALL(INCH) =  2.84
         SPECIFIED PEAK 24-HOUR RAINFALL(INCH) =  6.99

         *USER SPECIFIED PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
           5-MINUTE FACTOR = 0.800
          30-MINUTE FACTOR = 0.820
           1-HOUR FACTOR = 0.820
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           3-HOUR FACTOR = 0.973
           6-HOUR FACTOR = 0.987
          24-HOUR FACTOR = 0.992

        UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
        UNIT INTERVAL PERCENTAGE OF LAG-TIME =  14.368
```

UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	1.048	510.905
2	3.604	1245.266
3	7.893	2090.429
4	14.680	3307.073
5	23.504	4300.043
6	33.552	4896.684
7	44.502	5336.008
8	54.904	5069.075
9	63.371	4126.129
10	69.837	3151.007
11	74.809	2423.077
12	78.667	1880.098
13	81.579	1419.160
14	83.951	1155.937
15	85.883	941.323
16	87.386	732.586
17	88.696	638.091
18	89.625	452.741
19	90.486	419.874
20	91.263	378.356
21	91.984	351.390
22	92.623	311.589
23	93.231	296.145
24	93.841	297.521
25	94.309	227.943
26	94.706	193.441
27	95.102	193.087
28	95.449	168.768
29	95.765	154.053
30	96.081	154.053
31	96.392	151.733
32	96.656	128.555
33	96.907	122.298
34	97.158	122.376
35	97.409	122.298
36	97.642	113.721
37	97.813	83.341
38	97.979	80.824
39	98.145	80.664
40	98.311	80.824
41	98.476	80.664
42	98.642	80.828

43	98.796	74.998
44	98.871	36.830
45	98.933	29.907
46	98.994	29.825
47	99.055	29.907
48	99.117	29.825
49	99.178	29.825
50	99.239	29.907
51	99.300	29.825
52	99.362	29.829
53	99.423	29.825
54	99.484	29.829
55	99.545	29.825
56	99.606	29.829
57	99.668	29.829
58	99.729	29.825
59	99.790	29.829
60	99.851	29.825
61	99.912	29.829
62	99.974	29.825
63	100.000	12.834

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 1202.3899

TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1125.2114

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2 4 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

==========

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 750.0 1500.0 2250.0 3000.0
0.083	0.0255	3.70	Q . . . .
0.167	0.1131	12.72	Q . . . .
0.250	0.3052	27.89	Q . . . .
0.333	0.6625	51.88	Q . . . .
0.417	1.2349	83.11	VQ . . . .
0.500	2.0525	118.72	VQ . . . .
0.583	3.1377	157.57	V Q . . . .
0.667	4.4777	194.57	V Q . . . .
0.750	6.0259	224.80	V Q . . . .
0.833	7.7341	248.03	V Q . . . .
0.917	9.5662	266.03	V Q . . . .
1.000	11.4955	280.13	V Q . . . .
1.083	13.4992	290.93	V Q . . . .
1.167	15.5642	299.84	V Q . . . .
1.250	17.6800	307.22	V Q . . . .
1.333	19.8364	313.10	V Q . . . .
1.417	22.0287	318.32	V Q . . . .
1.500	24.2477	322.20	V Q . . . .
1.583	26.4919	325.86	V Q . . . .
1.667	28.7593	329.22	.V Q . . . .
1.750	31.0486	332.40	.V Q . . . .
1.833	33.3578	335.31	.V Q . . . .
1.917	35.6864	338.11	.V Q . . . .
2.000	38.0344	340.92	.V Q . . . .
2.083	40.3983	343.25	.V Q . . . .
2.167	42.7766	345.33	.V Q . . . .
2.250	45.1693	347.42	.V Q . . . .
2.333	47.5751	349.33	.V Q . . . .
2.417	49.9936	351.15	.V Q . . . .
2.500	52.4246	352.98	.V Q . . . .
2.583	54.8681	354.80	.V Q . . . .
2.667	57.3230	356.46	. V Q . . . .
2.750	59.7891	358.08	. V Q . . . .
2.833	62.2664	359.70	. V Q . . . .
2.917	64.7550	361.34	. V Q . . . .
3.000	67.2544	362.92	. V Q . . . .
3.083	69.7633	364.29	. V Q . . . .
3.167	72.2815	365.65	. V Q . . . .
3.250	74.8092	367.01	. V Q . . . .
3.333	77.3463	368.38	. V Q . . . .
3.417	79.8928	369.76	. V Q . . . .
3.500	82.4490	371.15	. V Q . . . .
3.583	85.0144	372.51	. VQ . . . .
3.667	87.5874	373.59	. VQ . . . .
3.750	90.1675	374.63	. VQ . . . .
3.833	92.7549	375.68	. V Q . . . .
3.917	95.3495	376.74	. V Q . . . .

4.000	97.9515	377.81	.	V	Q	.	.	.	.
4.083	100.5609	378.88	.	V	Q	.	.	.	.
4.167	103.1777	379.96	.	V	Q	.	.	.	.
4.250	105.8021	381.05	.	V	Q	.	.	.	.
4.333	108.4339	382.15	.	V	Q	.	.	.	.
4.417	111.0735	383.26	.	V	Q	.	.	.	.
4.500	113.7206	384.37	.		VQ	.	.	.	.
4.583	116.3756	385.49	.		VQ	.	.	.	.
4.667	119.0383	386.63	.		VQ	.	.	.	.
4.750	121.7088	387.77	.		VQ	.	.	.	.
4.833	124.3873	388.92	.		VQ	.	.	.	.
4.917	127.0738	390.08	.		VQ	.	.	.	.
5.000	129.7683	391.24	.		VQ	.	.	.	.
5.083	132.4710	392.42	.		VQ	.	.	.	.
5.167	135.1818	393.61	.		VQ	.	.	.	.
5.250	137.9000	394.69	.		VQ	.	.	.	.
5.333	140.6251	395.68	.		VQ	.	.	.	.
5.417	143.3570	396.68	.		Q	.	.	.	.
5.500	146.0959	397.69	.		Q	.	.	.	.
5.583	148.8419	398.71	.		Q	.	.	.	.
5.667	151.5949	399.74	.		Q	.	.	.	.
5.750	154.3552	400.79	.		Q	.	.	.	.
5.833	157.1226	401.84	.		Q	.	.	.	.
5.917	159.8974	402.90	.		Q	.	.	.	.
6.000	162.6796	403.98	.		Q	.	.	.	.
6.083	165.4693	405.06	.		Q	.	.	.	.
6.167	168.2666	406.16	.		Q	.	.	.	.
6.250	171.0715	407.27	.		QV	.	.	.	.
6.333	173.8840	408.39	.		QV	.	.	.	.
6.417	176.7045	409.52	.		QV	.	.	.	.
6.500	179.5327	410.67	.		QV	.	.	.	.
6.583	182.3690	411.83	.		QV	.	.	.	.
6.667	185.2133	413.00	.		QV	.	.	.	.
6.750	188.0658	414.18	.		QV	.	.	.	.
6.833	190.9266	415.38	.		QV	.	.	.	.
6.917	193.7957	416.59	.		QV	.	.	.	.
7.000	196.6732	417.81	.		QV	.	.	.	.
7.083	199.5592	419.05	.		Q	V	.	.	.
7.167	202.4539	420.31	.		Q	V	.	.	.
7.250	205.3573	421.58	.		Q	V	.	.	.
7.333	208.2696	422.86	.		Q	V	.	.	.
7.417	211.1908	424.16	.		Q	V	.	.	.
7.500	214.1210	425.47	.		Q	V	.	.	.
7.583	217.0605	426.80	.		Q	V	.	.	.
7.667	220.0091	428.15	.		Q	V	.	.	.
7.750	222.9672	429.51	.		Q	V	.	.	.
7.833	225.9348	430.89	.		Q		V	.	.
7.917	228.9120	432.29	.		Q		V	.	.
8.000	231.8990	433.71	.		Q		V	.	.
8.083	234.8958	435.14	.		Q		V	.	.
8.167	237.9027	436.59	.		Q		V	.	.
8.250	240.9197	438.07	.		Q		V	.	.
8.333	243.9469	439.56	.		Q		V	.	.
8.417	246.9846	441.07	.		Q		V	.	.
8.500	250.0328	442.60	.		Q		V	.	.
8.583	253.0917	444.16	.		Q		V	.	.
8.667	256.1615	445.73	.		Q		V.	.	.
8.750	259.2423	447.33	.		Q		V.	.	.

8.833	262.3342	448.95	.		Q		V.	.	.
8.917	265.4374	450.59	.		Q		V.	.	.
9.000	268.5522	452.25	.		Q		V.	.	.
9.083	271.6785	453.95	.		Q		V.	.	.
9.167	274.8167	455.66	.		Q		V.	.	.
9.250	277.9668	457.40	.		Q		V.	.	.
9.333	281.1292	459.17	.		Q		V.	.	.
9.417	284.3038	460.97	.		Q		V	.	.
9.500	287.4911	462.79	.		Q		V	.	.
9.583	290.6911	464.64	.		Q		V	.	.
9.667	293.9040	466.52	.		Q		V	.	.
9.750	297.1301	468.43	.		Q		V	.	.
9.833	300.3696	470.37	.		Q		V	.	.
9.917	303.6227	472.35	.		Q		V	.	.
10.000	306.8896	474.35	.		Q		V	.	.
10.083	310.1705	476.39	.		Q		.V	.	.
10.167	313.4657	478.46	.		Q		.V	.	.
10.250	316.7755	480.58	.		Q		.V	.	.
10.333	320.1000	482.72	.		Q		.V	.	.
10.417	323.4396	484.91	.		Q		.V	.	.
10.500	326.7945	487.13	.		Q		.V	.	.
10.583	330.1650	489.40	.		Q		.V	.	.
10.667	333.5514	491.70	.		Q		.V	.	.
10.750	336.9539	494.05	.		Q		.V	.	.
10.833	340.3730	496.45	.		Q		. V	.	.
10.917	343.8089	498.89	.		Q		. V	.	.
11.000	347.2619	501.37	.		Q		. V	.	.
11.083	350.7324	503.91	.		Q		. V	.	.
11.167	354.2206	506.50	.		Q		. V	.	.
11.250	357.7271	509.14	.		Q		. V	.	.
11.333	361.2522	511.84	.		Q		. V	.	.
11.417	364.7962	514.59	.		Q		. V	.	.
11.500	368.3596	517.40	.		Q		. V	.	.
11.583	371.9428	520.28	.		Q		. V	.	.
11.667	375.5462	523.21	.		Q		. V	.	.
11.750	379.1703	526.22	.			Q	. V	.	.
11.833	382.8156	529.29	.			Q	. V	.	.
11.917	386.4825	532.44	.			Q	. V	.	.
12.000	390.1715	535.65	.			Q	. V	.	.
12.083	393.8730	537.46	.			Q	. V	.	.
12.167	397.5727	537.20	.			Q	. V	.	.
12.250	401.2543	534.56	.			Q	. V	.	.
12.333	404.8939	528.48	.			Q	. V	.	.
12.417	408.4725	519.61	.		Q		. V	.	.
12.500	411.9790	509.14	.		Q		. V	.	.
12.583	415.4057	497.55	.		Q		. V	.	.
12.667	418.7589	486.89	.		Q		. V	.	.
12.750	422.0590	479.17	.		Q		. V	.	.
12.833	425.3267	474.47	.		Q		. V	.	.
12.917	428.5780	472.09	.		Q		. V	.	.
13.000	431.8250	471.46	.		Q		. V	.	.
13.083	435.0784	472.38	.		Q		. V	.	.
13.167	438.3446	474.25	.		Q		. V	.	.
13.250	441.6295	476.96	.		Q		. V	.	.
13.333	444.9386	480.49	.		Q		. V	.	.
13.417	448.2755	484.52	.		Q		. V	.	.
13.500	451.6456	489.33	.		Q		. V	.	.
13.583	455.0512	494.50	.		Q		. V	.	.

13.667	458.4951	500.05	. Q . V . . .
13.750	461.9798	505.98	. Q . V . . .
13.833	465.5082	512.33	. Q . V . . .
13.917	469.0831	519.07	. Q . V . . .
14.000	472.7068	526.16	. Q . V . . .
14.083	476.3960	535.66	. Q . V . . .
14.167	480.1717	548.23	. Q . V . . .
14.250	484.0576	564.24	. Q . V . . .
14.333	488.0867	585.03	. Q . V . . .
14.417	492.2868	609.85	. Q . V . . .
14.500	496.6756	637.25	. Q . V . . .
14.583	501.2676	666.77	. Q . V . . .
14.667	506.0609	695.99	. Q. V . . .
14.750	511.0375	722.59	. Q. V . . .
14.833	516.1786	746.49	. Q. V . . .
14.917	521.4728	768.71	. Q V . . .
15.000	526.9136	790.00	. Q V . . .
15.083	532.4984	810.91	. Q V . . .
15.167	538.2294	832.15	. .Q V. . .
15.250	544.1121	854.17	. .Q V. . .
15.333	550.1531	877.16	. .Q V. . .
15.417	556.3331	897.33	. .Q V. . .
15.500	562.6187	912.67	. . Q V . .
15.583	568.9791	923.53	. . Q V . .
15.667	575.3658	927.35	. . Q V . .
15.750	581.7625	928.79	. . Q V . .
15.833	588.1931	933.74	. . Q V . .
15.917	594.7360	950.02	. . Q .V . .
16.000	601.6459	1003.33	. . Q .V . .
16.083	610.1028	1227.94	. . Q .V . .
16.167	620.6995	1538.64	. . Q V . .
16.250	633.7637	1896.93	. . . V Q . .
16.333	649.8599	2337.16	. . . V .Q .
16.417	668.3397	2683.27	. . . V . Q .
16.500	688.1893	2882.16	. . . V . Q .
16.583	708.6994	2978.07	. . . V . Q.
16.667	728.2141	2833.54	. . . V . Q .
16.750	745.3422	2486.99	. . . V . Q .
16.833	760.0594	2136.94	. . . VQ . .
16.917	772.9265	1868.30	. . . Q V . .
17.000	784.3654	1660.93	. . . Q V . .
17.083	794.5795	1483.10	. . Q. V . .
17.167	803.9396	1359.07	. . Q . V . .
17.250	812.5391	1248.65	. . Q . V . .
17.333	820.3956	1140.76	. . Q . V. .
17.417	827.7024	1060.94	. . Q . V. .
17.500	834.3340	962.92	. . Q . V. .
17.583	840.5834	907.40	. . Q . V. .
17.667	846.4615	853.50	. .Q . V .
17.750	852.0296	808.49	. Q . V .
17.833	857.2975	764.90	. Q . V .
17.917	862.3400	732.17	. Q. . V .
18.000	867.1955	705.02	. Q. . V .
18.083	871.7693	664.13	. Q . . V .
18.167	876.1624	637.87	. Q . . .V .
18.250	880.4669	625.02	. Q . . .V .
18.333	884.6804	611.79	. Q . . .V .
18.417	888.8514	605.64	. Q . . .V .

18.500	893.0282	606.46	. Q . . .V .
18.583	897.2175	608.28	. Q . . .V .
18.667	901.3831	604.85	. Q . . . V .
18.750	905.5431	604.04	. Q . . . V .
18.833	909.6951	602.86	. Q . . . V .
18.917	913.8244	599.58	. Q . . . V .
19.000	917.9033	592.26	. Q . . . V .
19.083	921.8927	579.26	. Q . . . V .
19.167	925.8447	573.82	. Q . . . V .
19.250	929.7632	568.97	. Q . . . V .
19.333	933.6459	563.77	. Q . . . V .
19.417	937.4898	558.13	. Q . . . V .
19.500	941.2889	551.63	. Q . . . V .
19.583	945.0256	542.57	. Q . . . V .
19.667	948.6481	525.98	. Q . . . V .
19.750	952.2195	518.57	. Q . . . V .
19.833	955.7568	513.61	. Q . . . V .
19.917	959.2625	509.04	. Q . . . V .
20.000	962.7363	504.40	. Q . . . V .
20.083	966.1789	499.86	. Q . . . V .
20.167	969.5911	495.45	. Q . . . V .
20.250	972.9738	491.17	. Q . . . V .
20.333	976.3278	486.99	. Q . . . V .
20.417	979.6535	482.89	. Q . . . V .
20.500	982.9518	478.92	. Q . . . V .
20.583	986.2247	475.21	. Q . . . V .
20.667	989.4738	471.77	. Q . . . V .
20.750	992.6998	468.41	. Q . . . V .
20.833	995.9029	465.09	. Q . . . V .
20.917	999.0831	461.76	. Q . . . V .
21.000	1002.2399	458.37	. Q . . . V .
21.083	1005.3718	454.74	. Q . . . V .
21.167	1008.4742	450.48	. Q . . . V .
21.250	1011.5172	441.83	. Q . . . V .
21.333	1014.5125	434.92	. Q . . . V .
21.417	1017.4867	431.86	. Q . . . V .
21.500	1020.4418	429.08	. Q . . . V .
21.583	1023.3777	426.30	. Q . . . V .
21.667	1026.2939	423.42	. Q . . . V .
21.750	1029.1908	420.63	. Q . . . V .
21.833	1032.0691	417.93	. Q . . . V .
21.917	1034.9293	415.31	. Q . . . V .
22.000	1037.7720	412.76	. Q . . . V .
22.083	1040.5977	410.29	. Q . . . V .
22.167	1043.4067	407.88	. Q . . . V .
22.250	1046.2001	405.59	. Q . . . V .
22.333	1048.9784	403.40	. Q . . . V .
22.417	1051.7419	401.27	. Q . . . V .
22.500	1054.4912	399.19	. Q . . . V .
22.583	1057.2266	397.17	. Q . . . V .
22.667	1059.9482	395.19	. Q . . . V .
22.750	1062.6566	393.25	. Q . . . V .
22.833	1065.3519	391.36	. Q . . . V .
22.917	1068.0344	389.50	. Q . . . V .
23.000	1070.7045	387.69	. Q . . . V .
23.083	1073.3623	385.92	. Q . . . V .
23.167	1076.0082	384.18	. Q . . . V .
23.250	1078.6420	382.43	. Q . . . V .

23.333	1081.2637	380.67	.	Q	.	.	.	V .
23.417	1083.8735	378.95	.	Q	.	.	.	V .
23.500	1086.4717	377.26	.	Q	.	.	.	V .
23.583	1089.0583	375.59	.	Q	.	.	.	V .
23.667	1091.6338	373.96	.	Q	.	.	.	V .
23.750	1094.1982	372.35	.	Q	.	.	.	V .
23.833	1096.7518	370.78	.	Q	.	.	.	V .
23.917	1099.2947	369.22	.	Q	.	.	.	V.
24.000	1101.8270	367.70	.	Q	.	.	.	V.
24.083	1104.3236	362.50	.	Q	.	.	.	V.
24.167	1106.7480	352.03	.	Q	.	.	.	V.
24.250	1109.0586	335.50	.	Q	.	.	.	V.
24.333	1111.1952	310.24	.	Q	.	.	.	V.
24.417	1113.1091	277.91	.	Q	.	.	.	V.
24.500	1114.7716	241.39	.	Q	.	.	.	V.
24.583	1116.1616	201.84	.	Q	.	.	.	V.
24.667	1117.2936	164.37	.	Q	.	.	.	V.
24.750	1118.2155	133.86	.	Q	.	.	.	V.
24.833	1118.9767	110.53	.	Q	.	.	.	V.
24.917	1119.6141	92.55	.	Q	.	.	.	V.
25.000	1120.1553	78.57	.	Q	.	.	.	V.
25.083	1120.6234	67.98	Q	.	.	.	.	V.
25.167	1121.0321	59.34	Q	.	.	.	.	V.
25.250	1121.3922	52.28	Q	.	.	.	.	V.
25.333	1121.7142	46.76	Q	.	.	.	.	V.
25.417	1122.0032	41.95	Q	.	.	.	.	V.
25.500	1122.2683	38.50	Q	.	.	.	.	V.
25.583	1122.5115	35.30	Q	.	.	.	.	V.
25.667	1122.7347	32.41	Q	.	.	.	.	V.
25.750	1122.9396	29.74	Q	.	.	.	.	V.
25.833	1123.1279	27.36	Q	.	.	.	.	V.
25.917	1123.3008	25.10	Q	.	.	.	.	V.
26.000	1123.4581	22.84	Q	.	.	.	.	V.
26.083	1123.6034	21.10	Q	.	.	.	.	V.
26.167	1123.7384	19.61	Q	.	.	.	.	V.
26.250	1123.8633	18.13	Q	.	.	.	.	V.
26.333	1123.9792	16.84	Q	.	.	.	.	V.
26.417	1124.0870	15.65	Q	.	.	.	.	V.
26.500	1124.1868	14.47	Q	.	.	.	.	V.
26.583	1124.2784	13.32	Q	.	.	.	.	V.
26.667	1124.3634	12.33	Q	.	.	.	.	V.
26.750	1124.4419	11.40	Q	.	.	.	.	V.
26.833	1124.5139	10.46	Q	.	.	.	.	V.
26.917	1124.5796	9.54	Q	.	.	.	.	V.
27.000	1124.6393	8.68	Q	.	.	.	.	V.
27.083	1124.6946	8.04	Q	.	.	.	.	V.
27.167	1124.7457	7.42	Q	.	.	.	.	V.
27.250	1124.7926	6.81	Q	.	.	.	.	V.
27.333	1124.8352	6.19	Q	.	.	.	.	V.
27.417	1124.8737	5.59	Q	.	.	.	.	V.
27.500	1124.9080	4.98	Q	.	.	.	.	V.
27.583	1124.9384	4.42	Q	.	.	.	.	V.
27.667	1124.9668	4.13	Q	.	.	.	.	V.
27.750	1124.9937	3.90	Q	.	.	.	.	V.
27.833	1125.0189	3.67	Q	.	.	.	.	V.
27.917	1125.0426	3.44	Q	.	.	.	.	V.
28.000	1125.0647	3.21	Q	.	.	.	.	V.
28.083	1125.0852	2.98	Q	.	.	.	.	V.

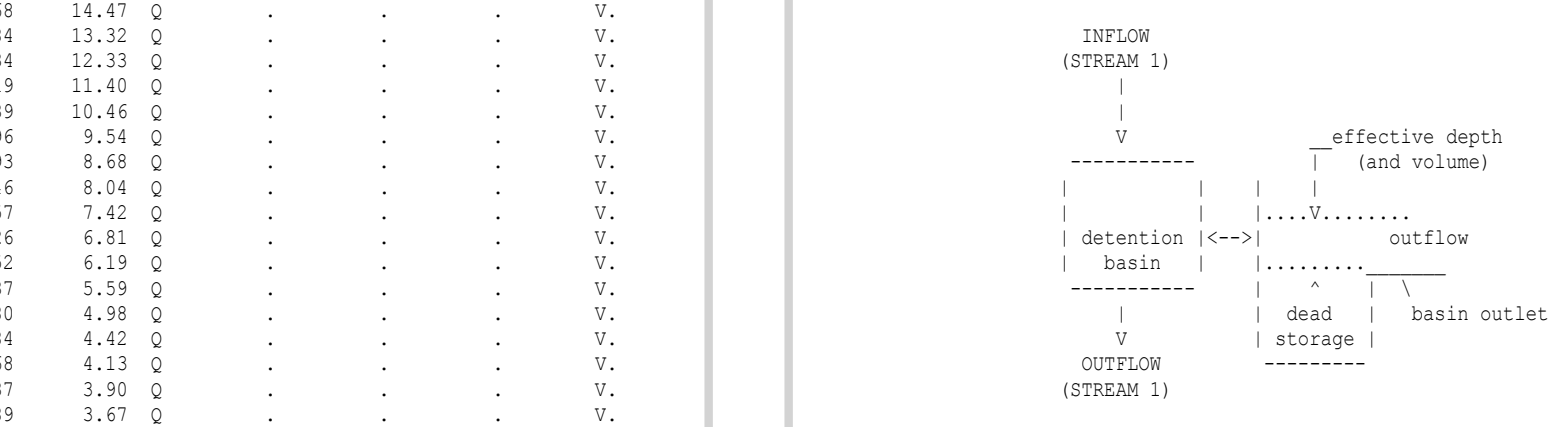
28.167	1125.1041	2.75	Q	.	.	.	.	V.
28.250	1125.1215	2.53	Q	.	.	.	.	V.
28.333	1125.1373	2.30	Q	.	.	.	.	V.
28.417	1125.1516	2.08	Q	.	.	.	.	V.
28.500	1125.1643	1.85	Q	.	.	.	.	V.
28.583	1125.1755	1.63	Q	.	.	.	.	V.
28.667	1125.1852	1.41	Q	.	.	.	.	V.
28.750	1125.1934	1.19	Q	.	.	.	.	V.
28.833	1125.2000	0.97	Q	.	.	.	.	V.
28.917	1125.2051	0.75	Q	.	.	.	.	V.
29.000	1125.2087	0.53	Q	.	.	.	.	V.
29.083	1125.2108	0.31	Q	.	.	.	.	V.
29.167	1125.2114	0.09	Q	.	.	.	.	V.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1750.0
10%	1395.0
20%	275.0
30%	135.0
40%	75.0
50%	55.0
60%	45.0
70%	35.0
80%	25.0
90%	20.0

FLOW PROCESS FROM NODE 353.00 TO NODE 353.00 IS CODE = 3.1

>>>>>FLOW-THROUGH DETENTION BASIN ROUTING MODEL APPLIED TO STREAM #1<<<<<



ROUTE RUNOFF HYDROGRAPH FROM STREAM NUMBER 1

THROUGH A FLOW-THROUGH DETENTION BASIN
SPECIFIED BASIN CONDITIONS ARE AS FOLLOWS:
DEAD STORAGE(AF) = 0.000
SPECIFIED DEAD STORAGE(AF) FILLED = 0.000
SPECIFIED EFFECTIVE VOLUME(AF) FILLED ABOVE OUTLET = 0.000
DETENTION BASIN CONSTANT LOSS RATE(CFS) = 0.00

BASIN DEPTH VERSUS OUTFLOW AND STORAGE INFORMATION:

INTERVAL NUMBER	DEPTH (FT)	OUTFLOW (CFS)	STORAGE (AF)
1	0.00	0.00	0.000
2	1.00	8.18	0.190
3	2.00	31.40	1.260
4	4.00	113.93	7.830
5	6.00	243.56	19.470
6	8.00	314.44	35.170
7	10.00	372.05	54.690
8	11.00	397.74	65.080
9	12.00	421.86	75.730
10	14.00	466.39	97.820
11	16.00	507.02	121.020
12	18.00	544.62	145.370
13	20.00	579.80	170.940
14	22.00	612.95	198.070
15	24.00	644.41	226.570
16	26.00	674.40	256.470
17	28.00	703.11	287.820
18	30.00	730.69	320.680
19	31.00	744.10	337.700
20	32.00	757.27	355.120

MODIFIED-PULS BASIN ROUTING MODEL RESULTS(5-MINUTE COMPUTATION INTERVALS):
(Note: Computed EFFECTIVE DEPTH and VOLUME are estimated at the clock time;
MEAN OUTFLOW is the average value during the unit interval.)

CLOCK TIME (HRS)	DEAD-STORAGE FILLED(AF)	INFLOW (CFS)	LOSS (CFS)	EFFECTIVE DEPTH(FT)	MEAN OUTFLOW (CFS)	EFFECTIVE VOLUME(AF)
16.083	0.000	1227.94	0.00	17.85	538.2	143.565
16.167	0.000	1538.64	0.00	18.39	546.7	150.396
16.250	0.000	1896.93	0.00	19.11	557.9	159.618
16.333	0.000	2337.16	0.00	20.06	572.5	171.772
16.417	0.000	2683.27	0.00	21.12	589.6	186.191
16.500	0.000	2882.16	0.00	22.27	607.8	201.854
16.583	0.000	2978.07	0.00	23.40	626.1	218.053
16.667	0.000	2833.54	0.00	24.44	643.0	233.139
16.750	0.000	2486.99	0.00	25.28	657.3	245.740
16.833	0.000	2136.94	0.00	25.96	668.7	255.852
16.917	0.000	1868.30	0.00	26.48	677.6	264.053
17.000	0.000	1660.93	0.00	26.91	684.4	270.778
17.083	0.000	1483.10	0.00	27.26	690.0	276.240
17.167	0.000	1359.07	0.00	27.55	694.6	280.816
17.250	0.000	1248.65	0.00	27.79	698.4	284.606

17.333	0.000	1140.76	0.00	27.99	701.6	287.631
17.417	0.000	1060.94	0.00	28.14	704.0	290.089
17.500	0.000	962.92	0.00	28.25	705.8	291.860
17.583	0.000	907.40	0.00	28.33	707.1	293.240
17.667	0.000	853.50	0.00	28.39	708.1	294.241
17.750	0.000	808.49	0.00	28.43	708.8	294.928
17.833	0.000	764.90	0.00	28.46	709.2	295.311
17.917	0.000	732.17	0.00	28.47	709.5	295.468
18.000	0.000	705.02	0.00	28.46	709.5	295.437
18.083	0.000	664.13	0.00	28.44	709.4	295.125
18.167	0.000	637.87	0.00	28.41	709.0	294.635
18.250	0.000	625.02	0.00	28.38	708.6	294.060
18.333	0.000	611.79	0.00	28.34	708.1	293.396
18.417	0.000	605.64	0.00	28.30	707.5	292.695
18.500	0.000	606.46	0.00	28.25	706.9	292.003
18.583	0.000	608.28	0.00	28.21	706.3	291.328
18.667	0.000	604.85	0.00	28.17	705.8	290.633
18.750	0.000	604.04	0.00	28.13	705.2	289.936
18.833	0.000	602.86	0.00	28.09	704.6	289.236
18.917	0.000	599.58	0.00	28.04	704.0	288.517
19.000	0.000	592.26	0.00	28.00	703.4	287.751
19.083	0.000	579.26	0.00	27.94	702.7	286.902
19.167	0.000	573.82	0.00	27.89	701.9	286.020
19.250	0.000	568.97	0.00	27.83	701.0	285.110
19.333	0.000	563.77	0.00	27.77	700.2	284.171
19.417	0.000	558.13	0.00	27.71	699.3	283.198
19.500	0.000	551.63	0.00	27.64	698.4	282.187
19.583	0.000	542.57	0.00	27.57	697.5	281.120
19.667	0.000	525.98	0.00	27.50	696.4	279.947
19.750	0.000	518.57	0.00	27.42	695.3	278.729
19.833	0.000	513.61	0.00	27.34	694.2	277.485
19.917	0.000	509.04	0.00	27.26	693.1	276.218
20.000	0.000	504.40	0.00	27.18	691.9	274.927
20.083	0.000	499.86	0.00	27.09	690.7	273.612
20.167	0.000	495.45	0.00	27.01	689.5	272.276
20.250	0.000	491.17	0.00	26.92	688.3	270.919
20.333	0.000	486.99	0.00	26.83	687.0	269.541
20.417	0.000	482.89	0.00	26.74	685.7	268.144
20.500	0.000	478.92	0.00	26.65	684.4	266.729
20.583	0.000	475.21	0.00	26.56	683.1	265.297
20.667	0.000	471.77	0.00	26.47	681.8	263.850
20.750	0.000	468.41	0.00	26.38	680.5	262.389
20.833	0.000	465.09	0.00	26.28	679.1	260.915
20.917	0.000	461.76	0.00	26.19	677.8	259.427
21.000	0.000	458.37	0.00	26.09	676.4	257.926
21.083	0.000	454.74	0.00	26.00	675.0	256.409
21.167	0.000	450.48	0.00	25.89	673.6	254.872
21.250	0.000	441.83	0.00	25.79	672.0	253.287
21.333	0.000	434.92	0.00	25.68	670.4	251.665
21.417	0.000	431.86	0.00	25.57	668.8	250.034
21.500	0.000	429.08	0.00	25.46	667.1	248.394
21.583	0.000	426.30	0.00	25.35	665.5	246.747
21.667	0.000	423.42	0.00	25.24	663.8	245.091
21.750	0.000	420.63	0.00	25.13	662.2	243.428
21.833	0.000	417.93	0.00	25.02	660.5	241.758
21.917	0.000	415.31	0.00	24.90	658.8	240.081
22.000	0.000	412.76	0.00	24.79	657.1	238.398
22.083	0.000	410.29	0.00	24.68	655.4	236.709

22.167	0.000	407.88	0.00	24.56	653.7	235.016
22.250	0.000	405.59	0.00	24.45	652.0	233.319
22.333	0.000	403.40	0.00	24.34	650.3	231.618
22.417	0.000	401.27	0.00	24.22	648.6	229.915
22.500	0.000	399.19	0.00	24.11	646.9	228.209
22.583	0.000	397.17	0.00	24.00	645.2	226.501
22.667	0.000	395.19	0.00	23.88	643.4	224.791
22.750	0.000	393.25	0.00	23.76	641.5	223.082
22.833	0.000	391.36	0.00	23.64	639.6	221.372
22.917	0.000	389.50	0.00	23.52	637.7	219.662
23.000	0.000	387.69	0.00	23.40	635.8	217.953
23.083	0.000	385.92	0.00	23.28	634.0	216.245
23.167	0.000	384.18	0.00	23.16	632.1	214.538
23.250	0.000	382.43	0.00	23.04	630.2	212.831
23.333	0.000	380.67	0.00	22.92	628.3	211.126
23.417	0.000	378.95	0.00	22.80	626.4	209.422
23.500	0.000	377.26	0.00	22.68	624.5	207.719
23.583	0.000	375.59	0.00	22.56	622.7	206.017
23.667	0.000	373.96	0.00	22.44	620.8	204.317
23.750	0.000	372.35	0.00	22.32	618.9	202.619
23.833	0.000	370.78	0.00	22.20	617.0	200.923
23.917	0.000	369.22	0.00	22.08	615.2	199.229

PROCESS SUMMARY OF STORAGE:
INFLOW VOLUME = 1125.211 AF
BASIN STORAGE = 0.000 AF (WITH 0.000 AF INITIALLY FILLED)
OUTFLOW VOLUME = 1125.212 AF
LOSS VOLUME = 0.000 AF

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FLOW PROCESS FROM NODE 353.00 TO NODE 353.00 IS CODE = 11

>>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<

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STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	200.0	400.0	600.0	800.0
0.083	0.0033	0.48	Q	.	.	.	.
0.167	0.0203	2.48	Q	.	.	.	.
0.250	0.0659	6.62	Q	.	.	.	.
0.333	0.1500	12.21	Q	.	.	.	.
0.417	0.2871	19.90	Q	.	.	.	.
0.500	0.4930	29.89	VQ	.	.	.	.
0.583	0.7701	40.24	V Q	.	.	.	.
0.667	1.1248	51.50	V Q	.	.	.	.
0.750	1.5698	64.62	V Q	.	.	.	.
0.833	2.1130	78.87	V Q	.	.	.	.
0.917	2.7579	93.64	V Q	.	.	.	.
1.000	3.5045	108.41	V Q	.	.	.	.
1.083	4.3461	122.19	V Q	.	.	.	.
1.167	5.2757	134.99	V Q	.	.	.	.
1.250	6.2911	147.44	V Q	.	.	.	.
1.333	7.3893	159.46	V Q	.	.	.	.
1.417	8.5670	171.00	V Q	.	.	.	.

1.500	9.8206	182.02	V	Q.	.	.	.
1.583	11.1464	192.51	V	Q.	.	.	.
1.667	12.5410	202.49	V	Q	.	.	.
1.750	14.0008	211.97	V	Q	.	.	.
1.833	15.5226	220.97	V	.Q	.	.	.
1.917	17.1033	229.52	V	.Q	.	.	.
2.000	18.7400	237.64	V	.Q	.	.	.
2.083	20.4186	243.73	V	. Q	.	.	.
2.167	22.1223	247.38	V	. Q	.	.	.
2.250	23.8470	250.41	V	. Q	.	.	.
2.333	25.5922	253.41	V	. Q	.	.	.
2.417	27.3579	256.38	V	. Q	.	.	.
2.500	29.1438	259.31	.V	. Q	.	.	.
2.583	30.9496	262.20	.V	. Q	.	.	.
2.667	32.7751	265.06	.V	. Q	.	.	.
2.750	34.6201	267.89	.V	. Q	.	.	.
2.833	36.4842	270.67	.V	. Q	.	.	.
2.917	38.3673	273.42	.V	. Q	.	.	.
3.000	40.2691	276.14	.V	. Q	.	.	.
3.083	42.1893	278.82	.V	. Q	.	.	.
3.167	44.1277	281.46	.V	. Q	.	.	.
3.250	46.0840	284.05	.V	. Q	.	.	.
3.333	48.0579	286.61	.V	. Q	.	.	.
3.417	50.0493	289.14	.V	. Q	.	.	.
3.500	52.0577	291.63	.V	. Q	.	.	.
3.583	54.0831	294.08	.V	. Q	.	.	.
3.667	56.1251	296.50	.V	. Q	.	.	.
3.750	58.1835	298.88	. V	. Q	.	.	.
3.833	60.2580	301.21	. V	. Q	.	.	.
3.917	62.3483	303.51	. V	. Q	.	.	.
4.000	64.4541	305.77	. V	. Q	.	.	.
4.083	66.5753	307.99	. V	. Q	.	.	.
4.167	68.7115	310.18	. V	. Q	.	.	.
4.250	70.8625	312.33	. V	. Q	.	.	.
4.333	73.0269	314.27	. V	. Q	.	.	.
4.417	75.2020	315.82	. V	. Q	.	.	.
4.500	77.3865	317.19	. V	. Q	.	.	.
4.583	79.5805	318.56	. V	. Q	.	.	.
4.667	81.7837	319.91	. V	. Q	.	.	.
4.750	83.9963	321.27	. V	. Q	.	.	.
4.833	86.2182	322.62	. V	. Q	.	.	.
4.917	88.4493	323.96	. V	. Q	.	.	.
5.000	90.6897	325.31	. V	. Q	.	.	.
5.083	92.9394	326.64	. V	. Q	.	.	.
5.167	95.1982	327.98	. V	. Q	.	.	.
5.250	97.4661	329.31	. V	. Q	.	.	.
5.333	99.7433	330.64	. V	. Q	.	.	.
5.417	102.0294	331.96	. V	. Q	.	.	.
5.500	104.3247	333.27	. V	. Q	.	.	.
5.583	106.6289	334.57	. V	. Q	.	.	.
5.667	108.9421	335.88	. V	. Q	.	.	.
5.750	111.2642	337.17	. V	. Q	.	.	.
5.833	113.5952	338.46	. V	. Q	.	.	.
5.917	115.9351	339.75	. V	. Q	.	.	.
6.000	118.2838	341.03	. V	. Q	.	.	.
6.083	120.6412	342.31	. V	. Q	.	.	.
6.167	123.0075	343.58	. V	. Q	.	.	.
6.250	125.3825	344.85	. V	. Q	.	.	.

6.333	127.7662	346.12	.	V	.	Q	.	.	.	
6.417	130.1587	347.38	.	V	.	Q	.	.	.	
6.500	132.5598	348.64	.	V	.	Q	.	.	.	
6.583	134.9696	349.90	.	V	.	Q	.	.	.	
6.667	137.3881	351.16	.	V	.	Q	.	.	.	
6.750	139.8152	352.42	.	V	.	Q	.	.	.	
6.833	142.2509	353.67	.	V	.	Q	.	.	.	
6.917	144.6953	354.93	.	V	.	Q	.	.	.	
7.000	147.1484	356.18	.	V	.	Q	.	.	.	
7.083	149.6100	357.43	.	V	.	Q	.	.	.	
7.167	152.0803	358.68	.	V	.	Q	.	.	.	
7.250	154.5592	359.94	.	V	.	Q	.	.	.	
7.333	157.0467	361.19	.	V	.	Q	.	.	.	
7.417	159.5429	362.44	.	V	.	Q	.	.	.	
7.500	162.0477	363.70	.	V	.	Q	.	.	.	
7.583	164.5612	364.96	.	V	.	Q	.	.	.	
7.667	167.0833	366.21	.	V	.	Q	.	.	.	
7.750	169.6142	367.47	.	V	.	Q	.	.	.	
7.833	172.1537	368.74	.	V	.	Q	.	.	.	
7.917	174.7019	370.00	.	V	.	Q	.	.	.	
8.000	177.2588	371.27	.	V	.	Q	.	.	.	
8.083	179.8239	372.45	.	V	.	Q	.	.	.	
8.167	182.3964	373.53	.	V	.	Q	.	.	.	
8.250	184.9764	374.61	.	V	.	Q	.	.	.	
8.333	187.5638	375.69	.	V	.	Q	.	.	.	
8.417	190.1587	376.78	.	V	.	Q	.	.	.	
8.500	192.7612	377.88	.	V	.	Q	.	.	.	
8.583	195.3713	378.99	.	V	.	Q	.	.	.	
8.667	197.9891	380.10	.	V	.	Q.	.	.	.	
8.750	200.6146	381.22	.	V	.	Q.	.	.	.	
8.833	203.2479	382.35	.	V	.	Q.	.	.	.	
8.917	205.8890	383.49	.	V	.	Q.	.	.	.	
9.000	208.5381	384.64	.	V	.	Q.	.	.	.	
9.083	211.1950	385.79	.	V	.	Q.	.	.	.	
9.167	213.8600	386.96	.	V	.	Q.	.	.	.	
9.250	216.5331	388.13	.	V	.	Q.	.	.	.	
9.333	219.2144	389.32	.	V	.	Q.	.	.	.	
9.417	221.9039	390.51	.	V	.	Q.	.	.	.	
9.500	224.6017	391.72	.	V	.	Q.	.	.	.	
9.583	227.3078	392.93	.	V	.	Q.	.	.	.	
9.667	230.0224	394.16	.	V	.	Q.	.	.	.	
9.750	232.7456	395.40	.	V	.	Q.	.	.	.	
9.833	235.4773	396.65	.	V	.	Q.	.	.	.	
9.917	238.2175	397.88	.	V	.	Q.	.	.	.	
10.000	240.9659	399.06	.	V	.	Q.	.	.	.	
10.083	243.7224	400.24	.	V	.	Q	.	.	.	
10.167	246.4871	401.44	.	V	.	Q	.	.	.	
10.250	249.2601	402.65	.	V	.	Q	.	.	.	
10.333	252.0416	403.87	.	V	.	Q	.	.	.	
10.417	254.8316	405.11	.	V.		Q	.	.	.	
10.500	257.6302	406.36	.	V.		Q	.	.	.	
10.583	260.4376	407.63	.	V.		Q	.	.	.	
10.667	263.2538	408.91	.	V.		Q	.	.	.	
10.750	266.0789	410.21	.	V.		Q	.	.	.	
10.833	268.9131	411.53	.	V.		Q	.	.	.	
10.917	271.7565	412.86	.	V.		Q	.	.	.	
11.000	274.6092	414.21	.	V.		Q	.	.	.	
11.083	277.4713	415.58	.	V.		Q	.	.	.	

11.167	280.3430	416.97	.	V.		Q	.	.	.	
11.250	283.2243	418.37	.	V		Q	.	.	.	
11.333	286.1155	419.80	.	V		Q	.	.	.	
11.417	289.0166	421.24	.	V		.Q	.	.	.	
11.500	291.9272	422.62	.	V		.Q	.	.	.	
11.583	294.8469	423.94	.	V		.Q	.	.	.	
11.667	297.7759	425.29	.	V		.Q	.	.	.	
11.750	300.7144	426.66	.	V		.Q	.	.	.	
11.833	303.6624	428.06	.	V		.Q	.	.	.	
11.917	306.6203	429.48	.	V		.Q	.	.	.	
12.000	309.5880	430.92	.	.V		.Q	.	.	.	
12.083	312.5658	432.37	.	.V		.Q	.	.	.	
12.167	315.5535	433.82	.	.V		.Q	.	.	.	
12.250	318.5510	435.23	.	.V		.Q	.	.	.	
12.333	321.5576	436.56	.	.V		.Q	.	.	.	
12.417	324.5724	437.76	.	.V		.Q	.	.	.	
12.500	327.5946	438.82	.	.V		.Q	.	.	.	
12.583	330.6229	439.71	.	.V		.Q	.	.	.	
12.667	333.6562	440.43	.	.V		. Q	.	.	.	
12.750	336.6935	441.02	.	.V		. Q	.	.	.	
12.833	339.7342	441.51	.	. V		. Q	.	.	.	
12.917	342.7779	441.95	.	. V		. Q	.	.	.	
13.000	345.8245	442.36	.	. V		. Q	.	.	.	
13.083	348.8739	442.77	.	. V		. Q	.	.	.	
13.167	351.9261	443.19	.	. V		. Q	.	.	.	
13.250	354.9815	443.64	.	. V		. Q	.	.	.	
13.333	358.0402	444.12	.	. V		. Q	.	.	.	
13.417	361.1025	444.65	.	. V		. Q	.	.	.	
13.500	364.1689	445.23	.	. V		. Q	.	.	.	
13.583	367.2396	445.88	.	. V		. Q	.	.	.	
13.667	370.3153	446.59	.	. V		. Q	.	.	.	
13.750	373.3963	447.36	.	. V		. Q	.	.	.	
13.833	376.4832	448.22	.	. V		. Q	.	.	.	
13.917	379.5765	449.15	.	. V		. Q	.	.	.	
14.000	382.6768	450.16	.	. V		. Q	.	.	.	
14.083	385.7847	451.27	.	. V		. Q	.	.	.	
14.167	388.9012	452.52	.	. V		. Q	.	.	.	
14.250	392.0276	453.95	.	. V		. Q	.	.	.	
14.333	395.1655	455.62	.	. V		. Q	.	.	.	
14.417	398.3168	457.57	.	. V		. Q	.	.	.	
14.500	401.4839	459.86	.	. V		. Q	.	.	.	
14.583	404.6692	462.51	.	. V		. Q	.	.	.	
14.667	407.8750	465.48	.	. V		. Q	.	.	.	
14.750	411.1020	468.56	.	. V		. Q	.	.	.	
14.833	414.3510	471.75	.	. V		. Q	.	.	.	
14.917	417.6236	475.18	.	. V		. Q	.	.	.	
15.000	420.9213	478.83	.	. V		. Q	.	.	.	
15.083	424.2455	482.68	.	. V		. Q	.	.	.	
15.167	427.5977	486.74	.	. V		. Q	.	.	.	
15.250	430.9794	491.02	.	. V		. Q	.	.	.	
15.333	434.3920	495.51	.	. V		. Q	.	.	.	
15.417	437.8369	500.20	.	. V		. Q	.	.	.	
15.500	441.3151	505.03	.	. V		. Q	.	.	.	
15.583	444.8251	509.66	.	. V		. Q	.	.	.	
15.667	448.3655	514.06	.	. V		. Q	.	.	.	
15.750	451.9360	518.44	.	. V		. Q	.	.	.	
15.833	455.5366	522.80	.	. V		. Q	.	.	.	
15.917	459.1677	527.24	.	. V		. Q	.	.	.	

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16.000   462.8315   531.99  .         .     V   .     Q   .         .
16.083   466.5379   538.16  .         .     V   .     Q   .         .
16.167   470.3029   546.68  .         .     V   .      Q  .         .
16.250   474.1451   557.88  .         .     V   .      Q  .         .
16.333   478.0880   572.52  .         .     V   .       Q .         .
16.417   482.1488   589.63  .         .      V  .        Q.         .
16.500   486.3346   607.78  .         .      V  .         Q         .
16.583   490.6464   626.07  .         .      V  .         .Q        .
16.667   495.0748   643.00  .         .      V  .         . Q       .
16.750   499.6018   657.32  .         .      V  .         . Q       .
16.833   504.2072   668.71  .         .      V  .         .  Q      .
16.917   508.8736   677.56  .         .       V .         .  Q      .
17.000   513.5873   684.42  .         .       V .         .   Q     .
17.083   518.3394   690.00  .         .       V .         .   Q     .
17.167   523.1231   694.60  .         .       V .         .   Q     .
17.250   527.9332   698.43  .         .       V .         .   Q     .
17.333   532.7648   701.55  .         .       V .         .    Q    .
17.417   537.6132   703.98  .         .        V.         .    Q    .
17.500   542.4738   705.76  .         .        V.         .    Q    .
17.583   547.3434   707.08  .         .        V.         .    Q    .
17.667   552.2200   708.08  .         .        V.         .    Q    .
17.750   557.1015   708.79  .         .        V.         .    Q    .
17.833   561.9860   709.24  .         .        V.         .    Q    .
17.917   566.8721   709.46  .         .         V         .    Q    .
18.000   571.7586   709.52  .         .         V         .    Q    .
18.083   576.6441   709.37  .         .         V         .    Q    .
18.167   581.5273   709.04  .         .         V         .    Q    .
18.250   586.4073   708.59  .         .         V         .    Q    .
18.333   591.2839   708.07  .         .         .V        .    Q    .
18.417   596.1564   707.50  .         .         .V        .    Q    .
18.500   601.0250   706.91  .         .         .V        .    Q    .
18.583   605.8895   706.34  .         .         .V        .    Q    .
18.667   610.7501   705.76  .         .         .V        .    Q    .
18.750   615.6068   705.18  .         .         .V        .    Q    .
18.833   620.4593   704.59  .         .         . V       .    Q    .
18.917   625.3077   704.00  .         .         . V       .    Q    .
19.000   630.1519   703.37  .         .         . V       .    Q    .
19.083   634.9911   702.66  .         .         . V       .    Q    .
19.167   639.8250   701.87  .         .         . V       .    Q    .
19.250   644.6531   701.04  .         .         . V       .    Q    .
19.333   649.4754   700.20  .         .         .  V      .    Q    .
19.417   654.2917   699.32  .         .         .  V      .   Q     .
19.500   659.1017   698.41  .         .         .  V      .   Q     .
19.583   663.9052   697.46  .         .         .  V      .   Q     .
19.667   668.7015   696.44  .         .         .  V      .   Q     .
19.750   673.4904   695.34  .         .         .  V      .   Q     .
19.833   678.2715   694.22  .         .         .   V     .   Q     .
19.917   683.0447   693.07  .         .         .   V     .   Q     .
20.000   687.8098   691.89  .         .         .   V     .   Q     .
20.083   692.5667   690.70  .         .         .   V     .   Q     .
20.167   697.3152   689.49  .         .         .   V     .   Q     .
20.250   702.0553   688.25  .         .         .   V     .   Q     .
20.333   706.7867   687.00  .         .         .    V    .   Q     .
20.417   711.5093   685.73  .         .         .    V    .   Q     .
20.500   716.2231   684.44  .         .         .    V    .   Q     .
20.583   720.9280   683.14  .         .         .    V    .   Q     .
20.667   725.6237   681.82  .         .         .    V    .   Q     .
20.750   730.3103   680.49  .         .         .    V    .   Q     .
```



```
20.833   734.9876   679.15  .         .         .     V   .  Q      .
20.917   739.6556   677.79  .         .         .     V   .  Q      .
21.000   744.3141   676.42  .         .         .     V   .  Q      .
21.083   748.9631   675.04  .         .         .     V   .  Q      .
21.167   753.6021   673.57  .         .         .     V   .  Q      .
21.250   758.2302   672.00  .         .         .     V   .  Q      .
21.333   762.8472   670.39  .         .         .      V  .  Q      .
21.417   767.4530   668.76  .         .         .      V  .  Q      .
21.500   772.0475   667.12  .         .         .      V  .  Q      .
21.583   776.6306   665.47  .         .         .      V  .  Q      .
21.667   781.2023   663.82  .         .         .      V  .  Q      .
21.750   785.7626   662.15  .         .         .      V  .  Q      .
21.833   790.3114   660.48  .         .         .       V .  Q      .
21.917   794.8486   658.80  .         .         .       V . Q       .
22.000   799.3742   657.12  .         .         .       V . Q       .
22.083   803.8882   655.43  .         .         .       V . Q       .
22.167   808.3904   653.73  .         .         .       V . Q       .
22.250   812.8810   652.03  .         .         .       V . Q       .
22.333   817.3598   650.33  .         .         .        V. Q       .
22.417   821.8269   648.62  .         .         .        V. Q       .
22.500   826.2822   646.91  .         .         .        V. Q       .
22.583   830.7257   645.19  .         .         .        V. Q       .
22.667   835.1567   643.39  .         .         .        V. Q       .
22.750   839.5748   641.50  .         .         .        V. Q       .
22.833   843.9799   639.62  .         .         .         VQ        .
22.917   848.3720   637.73  .         .         .         VQ        .
23.000   852.7511   635.84  .         .         .         VQ        .
23.083   857.1172   633.96  .         .         .         VQ        .
23.167   861.4703   632.07  .         .         .         VQ        .
23.250   865.8104   630.19  .         .         .         VQ        .
23.333   870.1376   628.30  .         .         .         VQ        .
23.417   874.4518   626.42  .         .         .         .Q        .
23.500   878.7531   624.54  .         .         .         .Q        .
23.583   883.0414   622.66  .         .         .         .Q        .
23.667   887.3168   620.78  .         .         .         .Q        .
23.750   891.5792   618.91  .         .         .         QV        .
23.833   895.8288   617.04  .         .         .         QV        .
23.917   900.0655   615.16  .         .         .         QV        .
24.000   904.2891   613.26  .         .         .         Q V       .
24.083   908.4988   611.25  .         .         .         Q V       .
24.167   912.6938   609.12  .         .         .         Q V       .
24.250   916.8736   606.90  .         .         .         Q V       .
24.333   921.0370   604.52  .         .         .         Q V       .
24.417   925.1824   601.92  .         .         .         Q V       .
24.500   929.3081   599.05  .         .         .        Q.  V      .
24.583   933.4120   595.89  .         .         .        Q.  V      .
24.667   937.4921   592.43  .         .         .        Q.  V      .
24.750   941.5466   588.71  .         .         .        Q.  V      .
24.833   945.5742   584.80  .         .         .        Q.  V      .
24.917   949.5734   580.69  .         .         .        Q.  V      .
25.000   953.5418   576.21  .         .         .       Q .  V      .
25.083   957.4775   571.46  .         .         .       Q .   V     .
25.167   961.3802   566.67  .         .         .       Q .   V     .
25.250   965.2497   561.86  .         .         .       Q .   V     .
25.333   969.0859   557.02  .         .         .      Q  .   V     .
25.417   972.8889   552.19  .         .         .      Q  .   V     .
25.500   976.6586   547.36  .         .         .      Q  .   V     .
25.583   980.3933   542.27  .         .         .      Q  .   V     .
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25.667    984.0911    536.92  .         .         .     Q   .   V     .
25.750    987.7520    531.57  .         .         .     Q   .    V    .
25.833    991.3762    526.24  .         .         .     Q   .    V    .
25.917    994.9641    520.96  .         .         .     Q   .    V    .
26.000    998.5157    515.70  .         .         .    Q    .    V    .
26.083   1002.0314    510.47  .         .         .    Q    .    V    .
26.167   1005.5093    505.00  .         .         .    Q    .    V    .
26.250   1008.9476    499.23  .         .         .   Q     .    V    .
26.333   1012.3460    493.46  .         .         .   Q     .    V    .
26.417   1015.7051    487.73  .         .         .   Q     .     V   .
26.500   1019.0251    482.07  .         .         .   Q     .     V   .
26.583   1022.3065    476.45  .         .         .  Q      .     V   .
26.667   1025.5496    470.90  .         .         .  Q      .     V   .
26.750   1028.7528    465.11  .         .         .  Q      .     V   .
26.833   1031.9138    458.98  .         .         . Q       .     V   .
26.917   1035.0322    452.79  .         .         . Q       .     V   .
27.000   1038.1085    446.67  .         .         . Q       .     V   .
27.083   1041.1432    440.63  .         .         . Q       .      V  .
27.167   1044.1367    434.66  .         .         .Q        .      V  .
27.250   1047.0896    428.77  .         .         .Q        .      V  .
27.333   1050.0017    422.83  .         .         .Q        .      V  .
27.417   1052.8710    416.62  .         .         Q         .      V  .
27.500   1055.6964    410.26  .         .         Q         .      V  .
27.583   1058.4786    403.98  .         .         Q         .      V  .
27.667   1061.2173    397.66  .         .        Q.         .      V  .
27.750   1063.9111    391.15  .         .        Q.         .      V  .
27.833   1066.5599    384.61  .         .        Q.         .      V  .
27.917   1069.1644    378.18  .         .      Q .         .       V .
28.000   1071.7231    371.53  .         .      Q .         .       V .
28.083   1074.2328    364.40  .         .      Q .         .       V .
28.167   1076.6923    357.12  .         .     Q  .         .       V .
28.250   1079.1027    349.99  .         .     Q  .         .       V .
28.333   1081.4648    343.00  .         .     Q  .         .       V .
28.417   1083.7799    336.14  .         .    Q   .         .       V .
28.500   1086.0486    329.41  .         .    Q   .         .       V .
28.583   1088.2719    322.82  .         .    Q   .         .       V .
28.667   1090.4484    316.02  .         .   Q    .         .       V .
28.750   1092.5676    307.72  .         .   Q    .         .       V .
28.833   1094.6222    298.33  .         .  Q     .         .       V .
28.917   1096.6141    289.22  .         .  Q     .         .       V .
29.000   1098.5452    280.39  .         .  Q     .         .        V.
29.083   1100.4172    271.82  .         . Q      .         .        V.
29.167   1102.2319    263.50  .         . Q      .         .        V.
29.250   1103.9911    255.43  .         .Q       .         .        V.
29.333   1105.6964    247.61  .         .Q       .         .        V.
29.417   1107.3142    234.91  .         Q        .         .        V.
29.500   1108.8135    217.70  .        Q         .         .        V.
29.583   1110.2020    201.62  .        Q         .         .        V.
29.667   1111.4880    186.73  .       Q.         .         .        V.
29.750   1112.6791    172.93  .      Q .         .         .        V.
29.833   1113.7821    160.16  .      Q .         .         .        V.
29.917   1114.8037    148.33  .     Q  .         .         .        V.
30.000   1115.7498    137.37  .    Q   .         .         .        V.
30.083   1116.6260    127.23  .    Q   .         .         .        V.
30.167   1117.4373    117.79  .   Q    .         .         .        V.
30.250   1118.1848    108.54  .   Q    .         .         .        V.
30.333   1118.8704     99.54  .  Q     .         .         .        V.
30.417   1119.4990     91.28  .  Q     .         .         .        V.
```



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30.500   1120.0756     83.71  .   Q     .         .         .        V.
30.583   1120.6042     76.77  .  Q      .         .         .        V.
30.667   1121.0891     70.41  .  Q      .         .         .        V.
30.750   1121.5338     64.57  .  Q      .         .         .        V.
30.833   1121.9417     59.21  . Q       .         .         .        V.
30.917   1122.3157     54.30  . Q       .         .         .        V.
31.000   1122.6587     49.80  . Q       .         .         .        V.
31.083   1122.9733     45.67  . Q       .         .         .        V.
31.167   1123.2617     41.88  . Q       .         .         .        V.
31.250   1123.5262     38.41  .Q        .         .         .        V.
31.333   1123.7688     35.22  .Q        .         .         .        V.
31.417   1123.9901     32.14  .Q        .         .         .        V.
31.500   1124.1860     28.45  .Q        .         .         .        V.
31.583   1124.3547     24.49  .Q        .         .         .        V.
31.667   1124.5000     21.08  .Q        .         .         .        V.
31.750   1124.6250     18.15  Q         .         .         .        V.
31.833   1124.7327     15.63  Q         .         .         .        V.
31.917   1124.8253     13.45  Q         .         .         .        V.
32.000   1124.9052     11.58  Q         .         .         .        V.
32.083   1124.9739      9.97  Q         .         .         .        V.
32.167   1125.0323      8.48  Q         .         .         .        V.
32.250   1125.0787      6.74  Q         .         .         .        V.
32.333   1125.1132      5.00  Q         .         .         .        V.
32.417   1125.1387      3.71  Q         .         .         .        V.
32.500   1125.1576      2.75  Q         .         .         .        V.
32.583   1125.1716      2.04  Q         .         .         .        V.
32.667   1125.1820      1.51  Q         .         .         .        V.
32.750   1125.1897      1.12  Q         .         .         .        V.
32.833   1125.1954      0.83  Q         .         .         .        V.
32.917   1125.1997      0.62  Q         .         .         .        V.
33.000   1125.2029      0.46  Q         .         .         .        V.
33.083   1125.2052      0.34  Q         .         .         .        V.
33.167   1125.2069      0.25  Q         .         .         .        V.
33.250   1125.2083      0.19  Q         .         .         .        V.
33.333   1125.2092      0.14  Q         .         .         .        V.
33.417   1125.2100      0.10  Q         .         .         .        V.
33.500   1125.2104      0.08  Q         .         .         .        V.
33.583   1125.2108      0.06  Q         .         .         .        V.
33.667   1125.2111      0.04  Q         .         .         .        V.
33.750   1125.2113      0.03  Q         .         .         .        V.
33.833   1125.2114      0.02  Q         .         .         .        V.
33.917   1125.2115      0.02  Q         .         .         .        V.
34.000   1125.2117      0.01  Q         .         .         .        V.
34.083   1125.2118      0.01  Q         .         .         .        V.
```

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	2045.0
10%	1790.0
20%	1725.0
30%	1665.0
40%	1545.0
50%	1280.0

60%	935.0
70%	655.0
80%	530.0
90%	375.0

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END OF FLOODSCx ROUTING ANALYSIS

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            F L O O D   R O U T I N G   A N A L Y S I S
         USING COUNTY HYDROLOGY MANUAL OF SAN BERNARDINO(1986)
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                        Analysis prepared by:

                            RBF Consulting
                         14257 Alton Parkway
                              Irvine, CA
                                92618

 ************************* DESCRIPTION OF STUDY *************************
* REDLANDS MASTER PLAN OF DRAINAGE UPDATE                               *
* PROPOSED UH ANALYSIS AT NODE 20454 WITH SMALLER OPAL BASIN            *
* NODE 20454 AMC II - BY TMULI  APRIL 2014                              *
 ************************************************************************

  FILE NAME: 353C.DAT
  TIME/DATE OF STUDY: 11:01 04/07/2014


************************************************************************
  FLOW PROCESS FROM NODE    353.00 TO NODE    353.00 IS CODE =   1
------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
========================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =    4029.500 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.580 HOURS
         VALLEY(DEVELOPED):
                  "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.406
         FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.000
         MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.000
         VALLEY(UNDEVELOPED)/DESERT:
                  "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.594
         DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.000
         MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) =  0.580
         LOW LOSS FRACTION = 0.540
         *HYDROGRAPH MODEL #1 SPECIFIED*

         SPECIFIED PEAK  5-MINUTES RAINFALL(INCH)=  0.45
         SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)=  0.93
         SPECIFIED PEAK  1-HOUR RAINFALL(INCH) =  1.22
         SPECIFIED PEAK  3-HOUR RAINFALL(INCH) =  2.05
         SPECIFIED PEAK  6-HOUR RAINFALL(INCH) =  2.84
         SPECIFIED PEAK 24-HOUR RAINFALL(INCH) =  6.99

         *USER SPECIFIED PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
           5-MINUTE FACTOR = 0.800
          30-MINUTE FACTOR = 0.820
           1-HOUR FACTOR = 0.820
```



```
           3-HOUR FACTOR = 0.973
           6-HOUR FACTOR = 0.987
          24-HOUR FACTOR = 0.992

        UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
        UNIT INTERVAL PERCENTAGE OF LAG-TIME =  14.368
```

UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	1.048	510.905
2	3.604	1245.266
3	7.893	2090.429
4	14.680	3307.073
5	23.504	4300.043
6	33.552	4896.684
7	44.502	5336.008
8	54.904	5069.075
9	63.371	4126.129
10	69.837	3151.007
11	74.809	2423.077
12	78.667	1880.098
13	81.579	1419.160
14	83.951	1155.937
15	85.883	941.323
16	87.386	732.586
17	88.696	638.091
18	89.625	452.741
19	90.486	419.874
20	91.263	378.356
21	91.984	351.390
22	92.623	311.589
23	93.231	296.145
24	93.841	297.521
25	94.309	227.943
26	94.706	193.441
27	95.102	193.087
28	95.449	168.768
29	95.765	154.053
30	96.081	154.053
31	96.392	151.733
32	96.656	128.555
33	96.907	122.298
34	97.158	122.376
35	97.409	122.298
36	97.642	113.721
37	97.813	83.341
38	97.979	80.824
39	98.145	80.664
40	98.311	80.824
41	98.476	80.664
42	98.642	80.828

43	98.796	74.998
44	98.871	36.830
45	98.933	29.907
46	98.994	29.825
47	99.055	29.907
48	99.117	29.825
49	99.178	29.825
50	99.239	29.907
51	99.300	29.825
52	99.362	29.829
53	99.423	29.825
54	99.484	29.829
55	99.545	29.825
56	99.606	29.829
57	99.668	29.829
58	99.729	29.825
59	99.790	29.829
60	99.851	29.825
61	99.912	29.829
62	99.974	29.825
63	100.000	12.834

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 1202.3899

TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1125.2114

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2 4 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

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HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 750.0 1500.0 2250.0 3000.0
0.083	0.0255	3.70	Q . . . .
0.167	0.1131	12.72	Q . . . .
0.250	0.3052	27.89	Q . . . .
0.333	0.6625	51.88	Q . . . .
0.417	1.2349	83.11	VQ . . . .
0.500	2.0525	118.72	VQ . . . .
0.583	3.1377	157.57	V Q . . . .
0.667	4.4777	194.57	V Q . . . .
0.750	6.0259	224.80	V Q . . . .
0.833	7.7341	248.03	V Q . . . .
0.917	9.5662	266.03	V Q . . . .
1.000	11.4955	280.13	V Q . . . .
1.083	13.4992	290.93	V Q . . . .
1.167	15.5642	299.84	V Q . . . .
1.250	17.6800	307.22	V Q . . . .
1.333	19.8364	313.10	V Q . . . .
1.417	22.0287	318.32	V Q . . . .
1.500	24.2477	322.20	V Q . . . .
1.583	26.4919	325.86	V Q . . . .
1.667	28.7593	329.22	.V Q . . . .
1.750	31.0486	332.40	.V Q . . . .
1.833	33.3578	335.31	.V Q . . . .
1.917	35.6864	338.11	.V Q . . . .
2.000	38.0344	340.92	.V Q . . . .
2.083	40.3983	343.25	.V Q . . . .
2.167	42.7766	345.33	.V Q . . . .
2.250	45.1693	347.42	.V Q . . . .
2.333	47.5751	349.33	.V Q . . . .
2.417	49.9936	351.15	.V Q . . . .
2.500	52.4246	352.98	.V Q . . . .
2.583	54.8681	354.80	.V Q . . . .
2.667	57.3230	356.46	. V Q . . . .
2.750	59.7891	358.08	. V Q . . . .
2.833	62.2664	359.70	. V Q . . . .
2.917	64.7550	361.34	. V Q . . . .
3.000	67.2544	362.92	. V Q . . . .
3.083	69.7633	364.29	. V Q . . . .
3.167	72.2815	365.65	. V Q . . . .
3.250	74.8092	367.01	. V Q . . . .
3.333	77.3463	368.38	. V Q . . . .
3.417	79.8928	369.76	. V Q . . . .
3.500	82.4490	371.15	. V Q . . . .
3.583	85.0144	372.51	. VQ . . . .
3.667	87.5874	373.59	. VQ . . . .
3.750	90.1675	374.63	. VQ . . . .
3.833	92.7549	375.68	. V Q . . . .
3.917	95.3495	376.74	. V Q . . . .

4.000	97.9515	377.81	.	V Q	.	.	.	.	.
4.083	100.5609	378.88	.	V Q	.	.	.	.	.
4.167	103.1777	379.96	.	V Q	.	.	.	.	.
4.250	105.8021	381.05	.	V Q	.	.	.	.	.
4.333	108.4339	382.15	.	V Q	.	.	.	.	.
4.417	111.0735	383.26	.	V Q	.	.	.	.	.
4.500	113.7206	384.37	.	VQ	.	.	.	.	.
4.583	116.3756	385.49	.	VQ	.	.	.	.	.
4.667	119.0383	386.63	.	VQ	.	.	.	.	.
4.750	121.7088	387.77	.	VQ	.	.	.	.	.
4.833	124.3873	388.92	.	VQ	.	.	.	.	.
4.917	127.0738	390.08	.	VQ	.	.	.	.	.
5.000	129.7683	391.24	.	VQ	.	.	.	.	.
5.083	132.4710	392.42	.	VQ	.	.	.	.	.
5.167	135.1818	393.61	.	VQ	.	.	.	.	.
5.250	137.9000	394.69	.	VQ	.	.	.	.	.
5.333	140.6251	395.68	.	VQ	.	.	.	.	.
5.417	143.3570	396.68	.	Q	.	.	.	.	.
5.500	146.0959	397.69	.	Q	.	.	.	.	.
5.583	148.8419	398.71	.	Q	.	.	.	.	.
5.667	151.5949	399.74	.	Q	.	.	.	.	.
5.750	154.3552	400.79	.	Q	.	.	.	.	.
5.833	157.1226	401.84	.	Q	.	.	.	.	.
5.917	159.8974	402.90	.	Q	.	.	.	.	.
6.000	162.6796	403.98	.	Q	.	.	.	.	.
6.083	165.4693	405.06	.	Q	.	.	.	.	.
6.167	168.2666	406.16	.	Q	.	.	.	.	.
6.250	171.0715	407.27	.	QV	.	.	.	.	.
6.333	173.8840	408.39	.	QV	.	.	.	.	.
6.417	176.7045	409.52	.	QV	.	.	.	.	.
6.500	179.5327	410.67	.	QV	.	.	.	.	.
6.583	182.3690	411.83	.	QV	.	.	.	.	.
6.667	185.2133	413.00	.	QV	.	.	.	.	.
6.750	188.0658	414.18	.	QV	.	.	.	.	.
6.833	190.9266	415.38	.	QV	.	.	.	.	.
6.917	193.7957	416.59	.	QV	.	.	.	.	.
7.000	196.6732	417.81	.	QV	.	.	.	.	.
7.083	199.5592	419.05	.	Q V	.	.	.	.	.
7.167	202.4539	420.31	.	Q V	.	.	.	.	.
7.250	205.3573	421.58	.	Q V	.	.	.	.	.
7.333	208.2696	422.86	.	Q V	.	.	.	.	.
7.417	211.1908	424.16	.	Q V	.	.	.	.	.
7.500	214.1210	425.47	.	Q V	.	.	.	.	.
7.583	217.0605	426.80	.	Q V	.	.	.	.	.
7.667	220.0091	428.15	.	Q V	.	.	.	.	.
7.750	222.9672	429.51	.	Q V	.	.	.	.	.
7.833	225.9348	430.89	.	Q V	.	.	.	.	.
7.917	228.9120	432.29	.	Q V	.	.	.	.	.
8.000	231.8990	433.71	.	Q V	.	.	.	.	.
8.083	234.8958	435.14	.	Q V	.	.	.	.	.
8.167	237.9027	436.59	.	Q V	.	.	.	.	.
8.250	240.9197	438.07	.	Q V	.	.	.	.	.
8.333	243.9469	439.56	.	Q V	.	.	.	.	.
8.417	246.9846	441.07	.	Q V	.	.	.	.	.
8.500	250.0328	442.60	.	Q V	.	.	.	.	.
8.583	253.0917	444.16	.	Q V	.	.	.	.	.
8.667	256.1615	445.73	.	Q V.	.	.	.	.	.
8.750	259.2423	447.33	.	Q V.	.	.	.	.	.

8.833	262.3342	448.95	.	Q V.	.	.	.	.	.
8.917	265.4374	450.59	.	Q V.	.	.	.	.	.
9.000	268.5522	452.25	.	Q V.	.	.	.	.	.
9.083	271.6785	453.95	.	Q V.	.	.	.	.	.
9.167	274.8167	455.66	.	Q V.	.	.	.	.	.
9.250	277.9668	457.40	.	Q V.	.	.	.	.	.
9.333	281.1292	459.17	.	Q V.	.	.	.	.	.
9.417	284.3038	460.97	.	Q V	.	.	.	.	.
9.500	287.4911	462.79	.	Q V	.	.	.	.	.
9.583	290.6911	464.64	.	Q V	.	.	.	.	.
9.667	293.9040	466.52	.	Q V	.	.	.	.	.
9.750	297.1301	468.43	.	Q V	.	.	.	.	.
9.833	300.3696	470.37	.	Q V	.	.	.	.	.
9.917	303.6227	472.35	.	Q V	.	.	.	.	.
10.000	306.8896	474.35	.	Q V	.	.	.	.	.
10.083	310.1705	476.39	.	Q .V	.	.	.	.	.
10.167	313.4657	478.46	.	Q .V	.	.	.	.	.
10.250	316.7755	480.58	.	Q .V	.	.	.	.	.
10.333	320.1000	482.72	.	Q .V	.	.	.	.	.
10.417	323.4396	484.91	.	Q .V	.	.	.	.	.
10.500	326.7945	487.13	.	Q .V	.	.	.	.	.
10.583	330.1650	489.40	.	Q .V	.	.	.	.	.
10.667	333.5514	491.70	.	Q .V	.	.	.	.	.
10.750	336.9539	494.05	.	Q .V	.	.	.	.	.
10.833	340.3730	496.45	.	Q . V	.	.	.	.	.
10.917	343.8089	498.89	.	Q . V	.	.	.	.	.
11.000	347.2619	501.37	.	Q . V	.	.	.	.	.
11.083	350.7324	503.91	.	Q . V	.	.	.	.	.
11.167	354.2206	506.50	.	Q . V	.	.	.	.	.
11.250	357.7271	509.14	.	Q . V	.	.	.	.	.
11.333	361.2522	511.84	.	Q . V	.	.	.	.	.
11.417	364.7962	514.59	.	Q . V	.	.	.	.	.
11.500	368.3596	517.40	.	Q . V	.	.	.	.	.
11.583	371.9428	520.28	.	Q . V	.	.	.	.	.
11.667	375.5462	523.21	.	Q . V	.	.	.	.	.
11.750	379.1703	526.22	.	Q . V	.	.	.	.	.
11.833	382.8156	529.29	.	Q . V	.	.	.	.	.
11.917	386.4825	532.44	.	Q . V	.	.	.	.	.
12.000	390.1715	535.65	.	Q . V	.	.	.	.	.
12.083	393.8730	537.46	.	Q . V	.	.	.	.	.
12.167	397.5727	537.20	.	Q . V	.	.	.	.	.
12.250	401.2543	534.56	.	Q . V	.	.	.	.	.
12.333	404.8939	528.48	.	Q . V	.	.	.	.	.
12.417	408.4725	519.61	.	Q . V	.	.	.	.	.
12.500	411.9790	509.14	.	Q . V	.	.	.	.	.
12.583	415.4057	497.55	.	Q . V	.	.	.	.	.
12.667	418.7589	486.89	.	Q . V	.	.	.	.	.
12.750	422.0590	479.17	.	Q . V	.	.	.	.	.
12.833	425.3267	474.47	.	Q . V	.	.	.	.	.
12.917	428.5780	472.09	.	Q . V	.	.	.	.	.
13.000	431.8250	471.46	.	Q . V	.	.	.	.	.
13.083	435.0784	472.38	.	Q . V	.	.	.	.	.
13.167	438.3446	474.25	.	Q . V	.	.	.	.	.
13.250	441.6295	476.96	.	Q . V	.	.	.	.	.
13.333	444.9386	480.49	.	Q . V	.	.	.	.	.
13.417	448.2755	484.52	.	Q . V	.	.	.	.	.
13.500	451.6456	489.33	.	Q . V	.	.	.	.	.
13.583	455.0512	494.50	.	Q . V	.	.	.	.	.

13.667	458.4951	500.05	. Q . V . . .
13.750	461.9798	505.98	. Q . V . . .
13.833	465.5082	512.33	. Q . V . . .
13.917	469.0831	519.07	. Q . V . . .
14.000	472.7068	526.16	. Q . V . . .
14.083	476.3960	535.66	. Q . V . . .
14.167	480.1717	548.23	. Q . V . . .
14.250	484.0576	564.24	. Q . V . . .
14.333	488.0867	585.03	. Q . V . . .
14.417	492.2868	609.85	. Q . V . . .
14.500	496.6756	637.25	. Q . V . . .
14.583	501.2676	666.77	. Q . V . . .
14.667	506.0609	695.99	. Q. V . . .
14.750	511.0375	722.59	. Q. V . . .
14.833	516.1786	746.49	. Q. V . . .
14.917	521.4728	768.71	. Q V . . .
15.000	526.9136	790.00	. Q V . . .
15.083	532.4984	810.91	. Q V . . .
15.167	538.2294	832.15	. .Q V. . .
15.250	544.1121	854.17	. .Q V. . .
15.333	550.1531	877.16	. .Q V. . .
15.417	556.3331	897.33	. .Q V. . .
15.500	562.6187	912.67	. . Q V . .
15.583	568.9791	923.53	. . Q V . .
15.667	575.3658	927.35	. . Q V . .
15.750	581.7625	928.79	. . Q V . .
15.833	588.1931	933.74	. . Q V . .
15.917	594.7360	950.02	. . Q .V . .
16.000	601.6459	1003.33	. . Q .V . .
16.083	610.1028	1227.94	. . Q .V . .
16.167	620.6995	1538.64	. . Q V . .
16.250	633.7637	1896.93	. . . V Q . .
16.333	649.8599	2337.16	. . . V .Q .
16.417	668.3397	2683.27	. . . V . Q .
16.500	688.1893	2882.16	. . . V . Q .
16.583	708.6994	2978.07	. . . V . Q.
16.667	728.2141	2833.54	. . . V . Q .
16.750	745.3422	2486.99	. . . V . Q .
16.833	760.0594	2136.94	. . . VQ . .
16.917	772.9265	1868.30	. . . Q V . .
17.000	784.3654	1660.93	. . . Q V . .
17.083	794.5795	1483.10	. . Q. V . .
17.167	803.9396	1359.07	. . Q . V . .
17.250	812.5391	1248.65	. . Q . V . .
17.333	820.3956	1140.76	. . Q . V. .
17.417	827.7024	1060.94	. . Q . V. .
17.500	834.3340	962.92	. . Q . V. .
17.583	840.5834	907.40	. . Q . V. .
17.667	846.4615	853.50	. .Q . V .
17.750	852.0296	808.49	. Q . V .
17.833	857.2975	764.90	. Q . V .
17.917	862.3400	732.17	. Q. . V .
18.000	867.1955	705.02	. Q. . V .
18.083	871.7693	664.13	. Q . . V .
18.167	876.1624	637.87	. Q . . .V .
18.250	880.4669	625.02	. Q . . .V .
18.333	884.6804	611.79	. Q . . .V .
18.417	888.8514	605.64	. Q . . .V .

18.500	893.0282	606.46	. Q . . .V .
18.583	897.2175	608.28	. Q . . .V .
18.667	901.3831	604.85	. Q . . . V .
18.750	905.5431	604.04	. Q . . . V .
18.833	909.6951	602.86	. Q . . . V .
18.917	913.8244	599.58	. Q . . . V .
19.000	917.9033	592.26	. Q . . . V .
19.083	921.8927	579.26	. Q . . . V .
19.167	925.8447	573.82	. Q . . . V .
19.250	929.7632	568.97	. Q . . . V .
19.333	933.6459	563.77	. Q . . . V .
19.417	937.4898	558.13	. Q . . . V .
19.500	941.2889	551.63	. Q . . . V .
19.583	945.0256	542.57	. Q . . . V .
19.667	948.6481	525.98	. Q . . . V .
19.750	952.2195	518.57	. Q . . . V .
19.833	955.7568	513.61	. Q . . . V .
19.917	959.2625	509.04	. Q . . . V .
20.000	962.7363	504.40	. Q . . . V .
20.083	966.1789	499.86	. Q . . . V .
20.167	969.5911	495.45	. Q . . . V .
20.250	972.9738	491.17	. Q . . . V .
20.333	976.3278	486.99	. Q . . . V .
20.417	979.6535	482.89	. Q . . . V .
20.500	982.9518	478.92	. Q . . . V .
20.583	986.2247	475.21	. Q . . . V .
20.667	989.4738	471.77	. Q . . . V .
20.750	992.6998	468.41	. Q . . . V .
20.833	995.9029	465.09	. Q . . . V .
20.917	999.0831	461.76	. Q . . . V .
21.000	1002.2399	458.37	. Q . . . V .
21.083	1005.3718	454.74	. Q . . . V .
21.167	1008.4742	450.48	. Q . . . V .
21.250	1011.5172	441.83	. Q . . . V .
21.333	1014.5125	434.92	. Q . . . V .
21.417	1017.4867	431.86	. Q . . . V .
21.500	1020.4418	429.08	. Q . . . V .
21.583	1023.3777	426.30	. Q . . . V .
21.667	1026.2939	423.42	. Q . . . V .
21.750	1029.1908	420.63	. Q . . . V .
21.833	1032.0691	417.93	. Q . . . V .
21.917	1034.9293	415.31	. Q . . . V .
22.000	1037.7720	412.76	. Q . . . V .
22.083	1040.5977	410.29	. Q . . . V .
22.167	1043.4067	407.88	. Q . . . V .
22.250	1046.2001	405.59	. Q . . . V .
22.333	1048.9784	403.40	. Q . . . V .
22.417	1051.7419	401.27	. Q . . . V .
22.500	1054.4912	399.19	. Q . . . V .
22.583	1057.2266	397.17	. Q . . . V .
22.667	1059.9482	395.19	. Q . . . V .
22.750	1062.6566	393.25	. Q . . . V .
22.833	1065.3519	391.36	. Q . . . V .
22.917	1068.0344	389.50	. Q . . . V .
23.000	1070.7045	387.69	. Q . . . V .
23.083	1073.3623	385.92	. Q . . . V .
23.167	1076.0082	384.18	. Q . . . V .
23.250	1078.6420	382.43	. Q . . . V .

23.333	1081.2637	380.67	.	Q	.	.	.	V .
23.417	1083.8735	378.95	.	Q	.	.	.	V .
23.500	1086.4717	377.26	.	Q	.	.	.	V .
23.583	1089.0583	375.59	.	Q	.	.	.	V .
23.667	1091.6338	373.96	.	Q	.	.	.	V .
23.750	1094.1982	372.35	.	Q	.	.	.	V .
23.833	1096.7518	370.78	.	Q	.	.	.	V .
23.917	1099.2947	369.22	.	Q	.	.	.	V.
24.000	1101.8270	367.70	.	Q	.	.	.	V.
24.083	1104.3236	362.50	.	Q	.	.	.	V.
24.167	1106.7480	352.03	.	Q	.	.	.	V.
24.250	1109.0586	335.50	.	Q	.	.	.	V.
24.333	1111.1952	310.24	.	Q	.	.	.	V.
24.417	1113.1091	277.91	.	Q	.	.	.	V.
24.500	1114.7716	241.39	.	Q	.	.	.	V.
24.583	1116.1616	201.84	.	Q	.	.	.	V.
24.667	1117.2936	164.37	.	Q	.	.	.	V.
24.750	1118.2155	133.86	.	Q	.	.	.	V.
24.833	1118.9767	110.53	.	Q	.	.	.	V.
24.917	1119.6141	92.55	.	Q	.	.	.	V.
25.000	1120.1553	78.57	.	Q	.	.	.	V.
25.083	1120.6234	67.98	Q	.	.	.	.	V.
25.167	1121.0321	59.34	Q	.	.	.	.	V.
25.250	1121.3922	52.28	Q	.	.	.	.	V.
25.333	1121.7142	46.76	Q	.	.	.	.	V.
25.417	1122.0032	41.95	Q	.	.	.	.	V.
25.500	1122.2683	38.50	Q	.	.	.	.	V.
25.583	1122.5115	35.30	Q	.	.	.	.	V.
25.667	1122.7347	32.41	Q	.	.	.	.	V.
25.750	1122.9396	29.74	Q	.	.	.	.	V.
25.833	1123.1279	27.36	Q	.	.	.	.	V.
25.917	1123.3008	25.10	Q	.	.	.	.	V.
26.000	1123.4581	22.84	Q	.	.	.	.	V.
26.083	1123.6034	21.10	Q	.	.	.	.	V.
26.167	1123.7384	19.61	Q	.	.	.	.	V.
26.250	1123.8633	18.13	Q	.	.	.	.	V.
26.333	1123.9792	16.84	Q	.	.	.	.	V.
26.417	1124.0870	15.65	Q	.	.	.	.	V.
26.500	1124.1868	14.47	Q	.	.	.	.	V.
26.583	1124.2784	13.32	Q	.	.	.	.	V.
26.667	1124.3634	12.33	Q	.	.	.	.	V.
26.750	1124.4419	11.40	Q	.	.	.	.	V.
26.833	1124.5139	10.46	Q	.	.	.	.	V.
26.917	1124.5796	9.54	Q	.	.	.	.	V.
27.000	1124.6393	8.68	Q	.	.	.	.	V.
27.083	1124.6946	8.04	Q	.	.	.	.	V.
27.167	1124.7457	7.42	Q	.	.	.	.	V.
27.250	1124.7926	6.81	Q	.	.	.	.	V.
27.333	1124.8352	6.19	Q	.	.	.	.	V.
27.417	1124.8737	5.59	Q	.	.	.	.	V.
27.500	1124.9080	4.98	Q	.	.	.	.	V.
27.583	1124.9384	4.42	Q	.	.	.	.	V.
27.667	1124.9668	4.13	Q	.	.	.	.	V.
27.750	1124.9937	3.90	Q	.	.	.	.	V.
27.833	1125.0189	3.67	Q	.	.	.	.	V.
27.917	1125.0426	3.44	Q	.	.	.	.	V.
28.000	1125.0647	3.21	Q	.	.	.	.	V.
28.083	1125.0852	2.98	Q	.	.	.	.	V.

28.167	1125.1041	2.75	Q	.	.	.	.	V.
28.250	1125.1215	2.53	Q	.	.	.	.	V.
28.333	1125.1373	2.30	Q	.	.	.	.	V.
28.417	1125.1516	2.08	Q	.	.	.	.	V.
28.500	1125.1643	1.85	Q	.	.	.	.	V.
28.583	1125.1755	1.63	Q	.	.	.	.	V.
28.667	1125.1852	1.41	Q	.	.	.	.	V.
28.750	1125.1934	1.19	Q	.	.	.	.	V.
28.833	1125.2000	0.97	Q	.	.	.	.	V.
28.917	1125.2051	0.75	Q	.	.	.	.	V.
29.000	1125.2087	0.53	Q	.	.	.	.	V.
29.083	1125.2108	0.31	Q	.	.	.	.	V.
29.167	1125.2114	0.09	Q	.	.	.	.	V.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1750.0
10%	1395.0
20%	275.0
30%	135.0
40%	75.0
50%	55.0
60%	45.0
70%	35.0
80%	25.0
90%	20.0

****
FLOW PROCESS FROM NODE 353.00 TO NODE 353.00 IS CODE = 3.1

>>>>>FLOW-THROUGH DETENTION BASIN ROUTING MODEL APPLIED TO STREAM #1<<<<<
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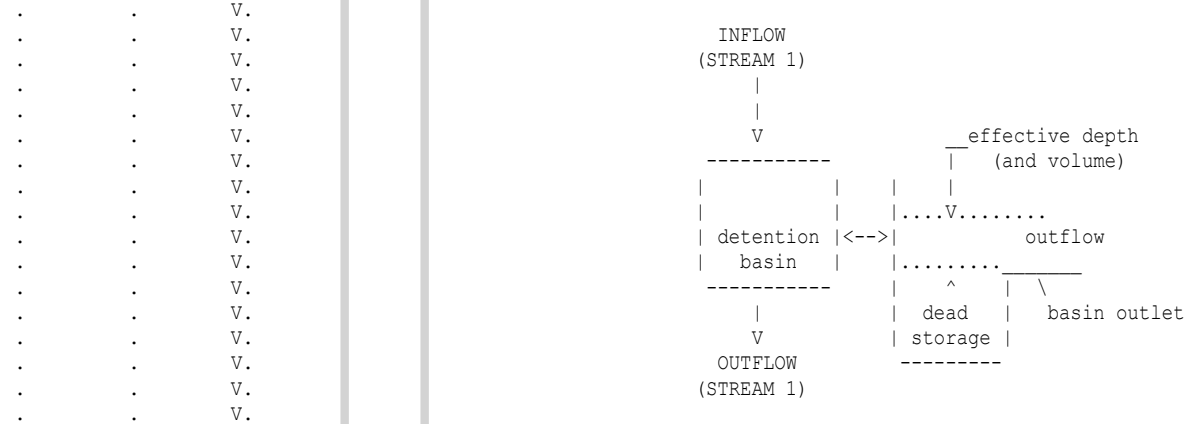

ROUTE RUNOFF HYDROGRAPH FROM STREAM NUMBER 1

THROUGH A FLOW-THROUGH DETENTION BASIN
SPECIFIED BASIN CONDITIONS ARE AS FOLLOWS:
DEAD STORAGE(AF) = 0.000
SPECIFIED DEAD STORAGE(AF) FILLED = 0.000
SPECIFIED EFFECTIVE VOLUME(AF) FILLED ABOVE OUTLET = 0.000
DETENTION BASIN CONSTANT LOSS RATE(CFS) = 0.00

BASIN DEPTH VERSUS OUTFLOW AND STORAGE INFORMATION:

INTERVAL NUMBER	DEPTH (FT)	OUTFLOW (CFS)	STORAGE (AF)
1	0.00	0.00	0.000
2	1.00	7.80	8.270
3	2.00	26.96	16.760
4	3.00	64.58	25.470
5	4.00	109.85	34.390
6	5.00	163.46	43.540
7	6.00	221.79	52.900
8	7.00	277.25	62.480
9	8.00	314.41	72.290
10	9.00	328.30	82.310
11	10.00	342.90	92.550
12	11.00	358.01	103.010
13	12.00	365.55	113.690
14	13.00	387.85	124.580
15	14.00	402.30	135.700
16	15.00	416.39	147.030
17	16.00	430.17	158.590
18	17.00	443.63	170.360
19	18.00	456.74	182.350
20	19.00	469.56	194.560
21	20.00	482.11	206.990
22	21.00	494.38	219.640
23	22.00	506.39	232.510
24	23.00	518.15	245.600
25	24.00	529.68	258.900
26	25.00	541.01	272.430
27	26.00	552.10	286.170
28	27.00	563.00	300.140
29	28.00	573.69	314.320
30	29.00	584.25	328.720
31	30.00	594.60	343.340
32	31.00	604.78	358.180
33	32.00	614.81	373.230
34	33.00	624.68	388.510
35	34.00	634.41	404.010
36	35.00	643.99	419.720
37	36.00	653.44	435.660
38	37.00	662.75	451.810
39	38.00	671.94	468.180
40	39.00	681.02	484.770

MODIFIED-PULS BASIN ROUTING MODEL RESULTS(5-MINUTE COMPUTATION INTERVALS):
(Note: Computed EFFECTIVE DEPTH and VOLUME are estimated at the clock time;
MEAN OUTFLOW is the average value during the unit interval.)

CLOCK TIME (HRS)	DEAD-STORAGE FILLED(AF)	INFLOW (CFS)	LOSS (CFS)	EFFECTIVE DEPTH(FT)	MEAN OUTFLOW (CFS)	EFFECTIVE VOLUME(AF)
15.083	0.000	810.91	0.00	16.67	437.7	166.435
15.167	0.000	832.15	0.00	16.90	440.7	169.131
15.250	0.000	854.17	0.00	17.13	443.8	171.957
15.333	0.000	877.16	0.00	17.38	447.0	174.919
15.417	0.000	897.33	0.00	17.64	450.3	177.998
15.500	0.000	912.67	0.00	17.90	453.7	181.159
15.583	0.000	923.53	0.00	18.17	457.1	184.371
15.667	0.000	927.35	0.00	18.43	460.5	187.586
15.750	0.000	928.79	0.00	18.69	463.9	190.787
15.833	0.000	933.74	0.00	18.95	467.3	194.000
15.917	0.000	950.02	0.00	19.22	470.6	197.301
16.000	0.000	1003.33	0.00	19.51	474.2	200.946
16.083	0.000	1227.94	0.00	19.93	478.6	206.106
16.167	0.000	1538.64	0.00	20.50	484.8	213.364
16.250	0.000	1896.93	0.00	21.26	492.9	223.034
16.333	0.000	2337.16	0.00	22.24	503.4	235.663
16.417	0.000	2683.27	0.00	23.38	515.8	250.590
16.500	0.000	2882.16	0.00	24.58	529.4	266.794
16.583	0.000	2978.07	0.00	25.81	543.1	283.563
16.667	0.000	2833.54	0.00	26.94	556.2	299.248
16.750	0.000	2486.99	0.00	27.87	567.3	312.469
16.833	0.000	2136.94	0.00	28.62	576.3	323.218
16.917	0.000	1868.30	0.00	29.23	583.4	332.067
17.000	0.000	1660.93	0.00	29.73	589.2	339.447
17.083	0.000	1483.10	0.00	30.15	594.0	345.571
17.167	0.000	1359.07	0.00	30.50	597.9	350.813
17.250	0.000	1248.65	0.00	30.80	601.3	355.271
17.333	0.000	1140.76	0.00	31.05	604.0	358.968
17.417	0.000	1060.94	0.00	31.26	606.3	362.099
17.500	0.000	962.92	0.00	31.42	608.2	364.542
17.583	0.000	907.40	0.00	31.56	609.7	366.592
17.667	0.000	853.50	0.00	31.67	610.9	368.262
17.750	0.000	808.49	0.00	31.76	612.0	369.616
17.833	0.000	764.90	0.00	31.83	612.8	370.664
17.917	0.000	732.17	0.00	31.88	613.4	371.482
18.000	0.000	705.02	0.00	31.93	613.9	372.110

PROCESS SUMMARY OF STORAGE:
INFLOW VOLUME = 1125.211 AF
BASIN STORAGE = 0.000 AF (WITH 0.000 AF INITIALLY FILLED)
OUTFLOW VOLUME = 1125.206 AF
LOSS VOLUME = 0.000 AF

FLOW PROCESS FROM NODE 353.00 TO NODE 353.00 IS CODE = 11

>>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<

STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	175.0	350.0	525.0	700.0
0.083	0.0001	0.01	Q	.	.	.	.
0.167	0.0005	0.07	Q	.	.	.	.
0.250	0.0019	0.20	Q	.	.	.	.
0.333	0.0050	0.45	Q	.	.	.	.
0.417	0.0111	0.89	Q	.	.	.	.
0.500	0.0217	1.53	Q	.	.	.	.
0.583	0.0383	2.42	Q	.	.	.	.
0.667	0.0627	3.54	Q	.	.	.	.
0.750	0.0963	4.88	Q	.	.	.	.
0.833	0.1403	6.38	Q	.	.	.	.
0.917	0.2003	8.72	Q	.	.	.	.
1.000	0.2854	12.35	Q	.	.	.	.
1.083	0.3995	16.57	Q	.	.	.	.
1.167	0.5432	20.87	VQ	.	.	.	.
1.250	0.7184	25.43	VQ	.	.	.	.
1.333	0.9388	32.01	VQ	.	.	.	.
1.417	1.2166	40.33	V Q	.	.	.	.
1.500	1.5508	48.53	V Q	.	.	.	.
1.583	1.9407	56.61	V Q	.	.	.	.
1.667	2.3875	64.88	V Q	.	.	.	.
1.750	2.8950	73.68	V Q	.	.	.	.
1.833	3.4639	82.62	V Q	.	.	.	.
1.917	4.0930	91.34	V Q	.	.	.	.
2.000	4.7808	99.87	V Q	.	.	.	.
2.083	5.5272	108.38	V Q	.	.	.	.
2.167	6.3349	117.27	V Q	.	.	.	.
2.250	7.2049	126.33	V Q	.	.	.	.
2.333	8.1355	135.11	V Q	.	.	.	.
2.417	9.1246	143.62	V Q	.	.	.	.
2.500	10.1705	151.87	V Q	.	.	.	.
2.583	11.2715	159.87	V Q.	.	.	.	.
2.667	12.4276	167.86	V Q.	.	.	.	.
2.750	13.6385	175.82	V Q	.	.	.	.
2.833	14.9023	183.51	V Q	.	.	.	.
2.917	16.2174	190.95	V Q	.	.	.	.
3.000	17.5820	198.14	V .Q	.	.	.	.
3.083	18.9945	205.09	V .Q	.	.	.	.
3.167	20.4532	211.81	V . Q	.	.	.	.
3.250	21.9567	218.30	V . Q	.	.	.	.
3.333	23.5020	224.38	V . Q	.	.	.	.
3.417	25.0863	230.04	V . Q	.	.	.	.
3.500	26.7084	235.53	V . Q	.	.	.	.
3.583	28.3672	240.86	.V . Q	.	.	.	.
3.667	30.0616	246.03	.V . Q	.	.	.	.
3.750	31.7905	251.03	.V . Q	.	.	.	.
3.833	33.5528	255.89	.V . Q	.	.	.	.
3.917	35.3475	260.59	.V . Q	.	.	.	.
4.000	37.1736	265.15	.V . Q	.	.	.	.
4.083	39.0301	269.58	.V . Q	.	.	.	.
4.167	40.9163	273.87	.V . Q	.	.	.	.
4.250	42.8278	277.55	.V . Q	.	.	.	.
4.333	44.7593	280.45	.V . Q	.	.	.	.
4.417	46.7089	283.08	.V . Q	.	.	.	.
4.500	48.6764	285.68	.V . Q	.	.	.	.
4.583	50.6614	288.23	.V . Q	.	.	.	.
4.667	52.6638	290.75	.V . Q	.	.	.	.

4.750	54.6834	293.24	.V	.	Q	.	.
4.833	56.7198	295.68	. V	.	Q	.	.
4.917	58.7728	298.10	. V	.	Q	.	.
5.000	60.8422	300.48	. V	.	Q	.	.
5.083	62.9279	302.84	. V	.	Q	.	.
5.167	65.0295	305.16	. V	.	Q	.	.
5.250	67.1469	307.45	. V	.	Q	.	.
5.333	69.2799	309.71	. V	.	Q	.	.
5.417	71.4283	311.94	. V	.	Q	.	.
5.500	73.5899	313.88	. V	.	Q	.	.
5.583	75.7601	315.11	. V	.	Q	.	.
5.667	77.9358	315.91	. V	.	Q	.	.
5.750	80.1170	316.71	. V	.	Q	.	.
5.833	82.3037	317.51	. V	.	Q	.	.
5.917	84.4960	318.32	. V	.	Q	.	.
6.000	86.6938	319.13	. V	.	Q	.	.
6.083	88.8973	319.94	. V	.	Q	.	.
6.167	91.1063	320.75	. V	.	Q	.	.
6.250	93.3210	321.57	. V	.	Q	.	.
6.333	95.5413	322.39	. V	.	Q	.	.
6.417	97.7673	323.21	. V	.	Q	.	.
6.500	99.9989	324.04	. V	.	Q	.	.
6.583	102.2363	324.87	. V	.	Q	.	.
6.667	104.4794	325.70	. V	.	Q	.	.
6.750	106.7283	326.53	. V	.	Q	.	.
6.833	108.9829	327.37	. V	.	Q	.	.
6.917	111.2434	328.22	. V	.	Q	.	.
7.000	113.5098	329.08	. V	.	Q	.	.
7.083	115.7822	329.95	. V	.	Q	.	.
7.167	118.0606	330.83	. V	.	Q	.	.
7.250	120.3451	331.71	. V	.	Q	.	.
7.333	122.6357	332.60	. V	.	Q.	.	.
7.417	124.9325	333.48	. V	.	Q.	.	.
7.500	127.2353	334.38	. V	.	Q.	.	.
7.583	129.5444	335.27	. V	.	Q.	.	.
7.667	131.8596	336.17	. V	.	Q.	.	.
7.750	134.1811	337.08	. V	.	Q.	.	.
7.833	136.5089	337.99	. V	.	Q.	.	.
7.917	138.8429	338.90	. V	.	Q.	.	.
8.000	141.1833	339.82	. V	.	Q.	.	.
8.083	143.5301	340.75	. V	.	Q.	.	.
8.167	145.8832	341.68	. V	.	Q.	.	.
8.250	148.2428	342.61	. V	.	Q.	.	.
8.333	150.6089	343.56	. V	.	Q.	.	.
8.417	152.9816	344.52	. V	.	Q.	.	.
8.500	155.3610	345.48	. V	.	Q.	.	.
8.583	157.7470	346.45	. V	.	Q.	.	.
8.667	160.1398	347.43	. V	.	Q.	.	.
8.750	162.5393	348.41	. V	.	Q.	.	.
8.833	164.9456	349.39	. V	.	Q.	.	.
8.917	167.3587	350.39	. V	.	Q	.	.
9.000	169.7787	351.39	. V	.	Q	.	.
9.083	172.2057	352.40	. V	.	Q	.	.
9.167	174.6396	353.41	. V	.	Q	.	.
9.250	177.0806	354.43	. V	.	Q	.	.
9.333	179.5287	355.46	. V	.	Q	.	.
9.417	181.9839	356.49	. V	.	Q	.	.
9.500	184.4461	357.52	. V	.	Q	.	.

9.583	186.9137	358.29	.	V	.	Q	.	.	
9.667	189.3849	358.81	.	V	.	Q	.	.	
9.750	191.8597	359.34	.	V	.	Q	.	.	
9.833	194.3382	359.87	.	V	.	Q	.	.	
9.917	196.8203	360.42	.	V	.	Q	.	.	
10.000	199.3063	360.96	.	V	.	Q	.	.	
10.083	201.7961	361.52	.	V	.	Q	.	.	
10.167	204.2898	362.08	.	V	.	Q	.	.	
10.250	206.7874	362.65	.	V	.	Q	.	.	
10.333	209.2889	363.23	.	V	.	Q	.	.	
10.417	211.7945	363.81	.	V	.	Q	.	.	
10.500	214.3042	364.40	.	V	.	Q	.	.	
10.583	216.8180	365.01	.	V	.	Q	.	.	
10.667	219.3384	365.96	.	V	.	Q	.	.	
10.750	221.8695	367.51	.	V	.	.Q	.	.	
10.833	224.4129	369.30	.	V	.	.Q	.	.	
10.917	226.9687	371.10	.	V	.	.Q	.	.	
11.000	229.5369	372.91	.	V	.	.Q	.	.	
11.083	232.1176	374.72	.	V	.	.Q	.	.	
11.167	234.7110	376.55	.	V	.	.Q	.	.	
11.250	237.3169	378.39	.	V	.	.Q	.	.	
11.333	239.9357	380.24	.	V	.	.Q	.	.	
11.417	242.5672	382.10	.	V	.	.Q	.	.	
11.500	245.2117	383.98	.	V	.	.Q	.	.	
11.583	247.8692	385.87	.	V	.	. Q	.	.	
11.667	250.5386	387.61	.	V	.	. Q	.	.	
11.750	253.2178	389.02	.	V.		. Q	.	.	
11.833	255.9055	390.26	.	V.		. Q	.	.	
11.917	258.6019	391.51	.	V.		. Q	.	.	
12.000	261.3070	392.78	.	V.		. Q	.	.	
12.083	264.0209	394.06	.	V.		. Q	.	.	
12.167	266.7436	395.34	.	V.		. Q	.	.	
12.250	269.4749	396.59	.	V.		. Q	.	.	
12.333	272.2145	397.79	.	V.		. Q	.	.	
12.417	274.9618	398.91	.	V.		. Q	.	.	
12.500	277.7162	399.94	.	V.		. Q	.	.	
12.583	280.4770	400.86	.	V.		. Q	.	.	
12.667	283.2434	401.68	.	V		. Q	.	.	
12.750	286.0147	402.39	.	V		. Q	.	.	
12.833	288.7904	403.03	.	V		. Q	.	.	
12.917	291.5703	403.63	.	V		. Q	.	.	
13.000	294.3541	404.21	.	V		. Q	.	.	
13.083	297.1419	404.79	.	V		. Q	.	.	
13.167	299.9338	405.38	.	V		. Q	.	.	
13.250	302.7297	405.97	.	V		. Q	.	.	
13.333	305.5300	406.60	.	V		. Q	.	.	
13.417	308.3347	407.24	.	V		. Q	.	.	
13.500	311.1440	407.92	.	.V		. Q	.	.	
13.583	313.9583	408.64	.	.V		. Q	.	.	
13.667	316.7779	409.39	.	.V		. Q	.	.	
13.750	319.6029	410.19	.	.V		. Q	.	.	
13.833	322.4337	411.04	.	.V		. Q	.	.	
13.917	325.2707	411.93	.	.V		. Q	.	.	
14.000	328.1142	412.87	.	.V		. Q	.	.	
14.083	330.9646	413.88	.	.V		. Q	.	.	
14.167	333.8225	414.97	.	.V		. Q	.	.	
14.250	336.6887	416.17	.	.V		. Q	.	.	
14.333	339.5639	417.48	.	. V		. Q	.	.	

14.417	342.4492	418.95	.	. V	.	Q	.	.	
14.500	345.3461	420.63	.	. V	.	Q	.	.	
14.583	348.2560	422.52	.	. V	.	Q	.	.	
14.667	351.1805	424.63	.	. V	.	Q	.	.	
14.750	354.1210	426.96	.	. V	.	Q	.	.	
14.833	357.0787	429.46	.	. V	.	Q	.	.	
14.917	360.0545	432.08	.	. V	.	Q	.	.	
15.000	363.0490	434.80	.	. V	.	Q	.	.	
15.083	366.0632	437.67	.	. V	.	Q	.	.	
15.167	369.0982	440.68	.	. V	.	Q	.	.	
15.250	372.1547	443.80	.	. V	.	Q	.	.	
15.333	375.2332	447.00	.	. V	.	Q	.	.	
15.417	378.3344	450.30	.	. V	.	Q	.	.	
15.500	381.4592	453.71	.	. V	.	Q	.	.	
15.583	384.6076	457.15	.	. V	.	Q	.	.	
15.667	387.7794	460.55	.	. V	.	Q	.	.	
15.750	390.9745	463.92	.	. V	.	Q	.	.	
15.833	394.1927	467.29	.	. V	.	Q	.	.	
15.917	397.4341	470.65	.	. V	.	Q	.	.	
16.000	400.6997	474.17	.	. V	.	Q	.	.	
16.083	403.9959	478.61	.	. V	.	Q	.	.	
16.167	407.3345	484.76	.	. V	.	Q	.	.	
16.250	410.7292	492.92	.	. V	.	Q	.	.	
16.333	414.1961	503.39	.	. V	.	Q	.	.	
16.417	417.7487	515.85	.	. V	.	Q.		.	
16.500	421.3947	529.38	.	. V	.	Q		.	
16.583	425.1353	543.14	.	. V	.	.Q		.	
16.667	428.9655	556.15	.	. V	.	.Q		.	
16.750	432.8726	567.30	.	. V	.	. Q		.	
16.833	436.8412	576.25	.	. V	.	. Q		.	
16.917	440.8593	583.42	.	. V	.	. Q		.	
17.000	444.9174	589.23	.	. V	.	. Q		.	
17.083	449.0082	593.99	.	. V	.	. Q		.	
17.167	453.1261	597.93	.	. V	.	. Q		.	
17.250	457.2670	601.26	.	. V	.	. Q		.	
17.333	461.4271	604.04	.	. V	.	. Q		.	
17.417	465.6031	606.35	.	. V	.	. Q		.	
17.500	469.7918	608.21	.	. V	.	. Q		.	
17.583	473.9909	609.70	.	. V	.	. Q		.	
17.667	478.1985	610.94	.	. V	.	. Q		.	
17.750	482.4130	611.95	.	. V	.	. Q		.	
17.833	486.6330	612.75	.	. V	.	. Q		.	
17.917	490.8574	613.37	.	. V	.	. Q		.	
18.000	495.0850	613.85	.	. V	.	. Q		.	
18.083	499.3149	614.18	.	. V	.	. Q		.	
18.167	503.5459	614.35	.	. V	.	. Q		.	
18.250	507.7775	614.42	.	. V	.	. Q		.	
18.333	512.0092	614.44	.	. V	.	. Q		.	
18.417	516.2407	614.42	.	. V	.	. Q		.	
18.500	520.4720	614.38	.	. V	.	. Q		.	
18.583	524.7030	614.35	.	. V	.	. Q		.	
18.667	528.9338	614.31	.	. V	.	. Q		.	
18.750	533.1642	614.27	.	. V	.	. Q		.	
18.833	537.3944	614.22	.	. V.		. Q		.	
18.917	541.6241	614.16	.	. V.		. Q		.	
19.000	545.8533	614.07	.	. V.		. Q		.	
19.083	550.0815	613.94	.	. V.		. Q		.	
19.167	554.3086	613.77	.	. V.		. Q		.	

```
19.250    558.5344    613.58  .         .        V.         .    Q    .
19.333    562.7586    613.36  .         .         V         .    Q    .
19.417    566.9812    613.12  .         .         V         .    Q    .
19.500    571.2020    612.86  .         .         V         .    Q    .
19.583    575.4207    612.55  .         .         V         .    Q    .
19.667    579.6369    612.20  .         .         V         .   Q     .
19.750    583.8503    611.78  .         .         V         .   Q     .
19.833    588.0607    611.35  .         .         V         .   Q     .
19.917    592.2679    610.89  .         .        .V         .   Q     .
20.000    596.4718    610.41  .         .        .V         .   Q     .
20.083    600.6723    609.91  .         .        .V         .   Q     .
20.167    604.8693    609.40  .         .        .V         .   Q     .
20.250    609.0626    608.87  .         .        .V         .   Q     .
20.333    613.2521    608.32  .         .        .V         .   Q     .
20.417    617.4377    607.76  .         .        .V         .   Q     .
20.500    621.6194    607.17  .         .        . V        .   Q     .
20.583    625.7969    606.58  .         .        . V        .   Q     .
20.667    629.9703    605.97  .         .        . V        .   Q     .
20.750    634.1393    605.35  .         .        . V        .   Q     .
20.833    638.3040    604.71  .         .        . V        .   Q     .
20.917    642.4641    604.04  .         .        . V        .   Q     .
21.000    646.6195    603.37  .         .        . V        .   Q     .
21.083    650.7701    602.67  .         .        .  V       .   Q     .
21.167    654.9159    601.97  .         .        .  V       .   Q     .
21.250    659.0566    601.23  .         .        .  V       .   Q     .
21.333    663.1921    600.46  .         .        .  V       .   Q     .
21.417    667.3221    599.68  .         .        .  V       .   Q     .
21.500    671.4466    598.88  .         .        .  V       .   Q     .
21.583    675.5656    598.07  .         .        .   V      .   Q     .
21.667    679.6789    597.26  .         .        .   V      .   Q     .
21.750    683.7866    596.43  .         .        .   V      .   Q     .
21.833    687.8884    595.60  .         .        .   V      .   Q     .
21.917    691.9845    594.75  .         .        .   V      .  Q      .
22.000    696.0746    593.88  .         .        .   V      .  Q      .
22.083    700.1586    592.99  .         .        .   V      .  Q      .
22.167    704.2364    592.10  .         .        .    V     .  Q      .
22.250    708.3080    591.19  .         .        .    V     .  Q      .
22.333    712.3733    590.29  .         .        .    V     .  Q      .
22.417    716.4323    589.37  .         .        .    V     .  Q      .
22.500    720.4850    588.45  .         .        .    V     .  Q      .
22.583    724.5314    587.53  .         .        .    V     .  Q      .
22.667    728.5713    586.60  .         .        .    V     .  Q      .
22.750    732.6048    585.66  .         .        .     V    .  Q      .
22.833    736.6318    584.72  .         .        .     V    .  Q      .
22.917    740.6522    583.76  .         .        .     V    .  Q      .
23.000    744.6658    582.78  .         .        .     V    .  Q      .
23.083    748.6726    581.79  .         .        .     V    .  Q      .
23.167    752.6726    580.80  .         .        .     V    .  Q      .
23.250    756.6657    579.80  .         .        .     V    .  Q      .
23.333    760.6520    578.80  .         .        .      V   .  Q      .
23.417    764.6313    577.80  .         .        .      V   .  Q      .
23.500    768.6038    576.79  .         .        .      V   . Q       .
23.583    772.5692    575.79  .         .        .      V   . Q       .
23.667    776.5277    574.77  .         .        .      V   . Q       .
23.750    780.4792    573.75  .         .        .      V   . Q       .
23.833    784.4235    572.71  .         .        .      V   . Q       .
23.917    788.3605    571.66  .         .        .       V  . Q       .
24.000    792.2903    570.61  .         .        .       V  . Q       .
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24.083    796.2128    569.55  .         .        .       V  . Q       .
24.167    800.1277    568.45  .         .        .       V  . Q       .
24.250    804.0347    567.28  .         .        .       V  . Q       .
24.333    807.9329    566.02  .         .        .       V  . Q       .
24.417    811.8214    564.61  .         .        .       V  . Q       .
24.500    815.6989    563.02  .         .        .       V  . Q       .
24.583    819.5638    561.20  .         .        .        V. Q       .
24.667    823.4149    559.17  .         .        .        V.Q        .
24.750    827.2509    556.98  .         .        .        V.Q        .
24.833    831.0707    554.65  .         .        .        V.Q        .
24.917    834.8738    552.20  .         .        .        V.Q        .
25.000    838.6592    549.64  .         .        .        V.Q        .
25.083    842.4264    547.00  .         .        .        V.Q        .
25.167    846.1751    544.32  .         .        .         VQ        .
25.250    849.9051    541.59  .         .        .         Q         .
25.333    853.6158    538.80  .         .        .         Q         .
25.417    857.3070    535.96  .         .        .         Q         .
25.500    860.9785    533.11  .         .        .         Q         .
25.583    864.6303    530.24  .         .        .         Q         .
25.667    868.2620    527.32  .         .        .         Q         .
25.750    871.8733    524.36  .         .        .        QV         .
25.833    875.4643    521.41  .         .        .        Q.V        .
25.917    879.0349    518.44  .         .        .        Q.V        .
26.000    882.5846    515.43  .         .        .        Q.V        .
26.083    886.1134    512.38  .         .        .        Q.V        .
26.167    889.6213    509.35  .         .        .        Q.V        .
26.250    893.1082    506.29  .         .        .       Q .V        .
26.333    896.5737    503.19  .         .        .       Q .V        .
26.417    900.0178    500.07  .         .        .       Q .V        .
26.500    903.4404    496.96  .         .        .       Q . V       .
26.583    906.8414    493.83  .         .        .       Q . V       .
26.667    910.2205    490.64  .         .        .       Q . V       .
26.750    913.5776    487.46  .         .        .      Q  . V       .
26.833    916.9128    484.28  .         .        .      Q  . V       .
26.917    920.2260    481.07  .         .        .      Q  . V       .
27.000    923.5168    477.82  .         .        .      Q  . V       .
27.083    926.7851    474.56  .         .        .      Q  . V       .
27.167    930.0311    471.33  .         .        .     Q   .  V      .
27.250    933.2546    468.05  .         .        .     Q   .  V      .
27.333    936.4553    464.73  .         .        .     Q   .  V      .
27.417    939.6331    461.42  .         .        .     Q   .  V      .
27.500    942.7883    458.13  .         .        .     Q   .  V      .
27.583    945.9205    454.79  .         .        .    Q    .  V      .
27.667    949.0294    451.41  .         .        .    Q    .  V      .
27.750    952.1151    448.06  .         .        .    Q    .  V      .
27.833    955.1779    444.71  .         .        .    Q    .  V      .
27.917    958.2172    441.31  .         .        .    Q    .   V     .
28.000    961.2328    437.88  .         .        .    Q    .   V     .
28.083    964.2250    434.46  .         .        .   Q     .   V     .
28.167    967.1938    431.06  .         .        .   Q     .   V     .
28.250    970.1388    427.61  .         .        .   Q     .   V     .
28.333    973.0599    424.14  .         .        .   Q     .   V     .
28.417    975.9572    420.69  .         .        .   Q     .   V     .
28.500    978.8307    417.25  .         .        .  Q      .   V     .
28.583    981.6803    413.76  .         .        .  Q      .   V     .
28.667    984.5057    410.24  .         .        .  Q      .   V     .
28.750    987.3070    406.75  .         .        .  Q      .    V    .
28.833    990.0844    403.28  .         .        .  Q      .    V    .
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28.917    992.8375    399.75  .         .         . Q       .    V    .
29.000    995.5662    396.20  .         .         . Q       .    V    .
29.083    998.2705    392.67  .         .         . Q       .    V    .
29.167   1000.9500    389.06  .         .         . Q       .    V    .
29.250   1003.5979    384.49  .         .         .Q        .    V    .
29.333   1006.2088    379.10  .         .         .Q        .    V    .
29.417   1008.7831    373.79  .         .         .Q        .    V    .
29.500   1011.3214    368.56  .         .         .Q        .    V    .
29.583   1013.8348    364.94  .         .         Q         .     V   .
29.667   1016.3350    363.03  .         .         Q         .     V   .
29.750   1018.8231    361.27  .         .         Q         .     V   .
29.833   1021.2991    359.52  .         .         Q         .     V   .
29.917   1023.7592    357.20  .         .         Q         .     V   .
30.000   1026.1973    354.00  .         .         Q         .     V   .
30.083   1028.6111    350.49  .         .         Q         .     V   .
30.167   1031.0011    347.02  .         .        Q.         .     V   .
30.250   1033.3674    343.60  .         .        Q.         .     V   .
30.333   1035.7106    340.22  .         .        Q.         .     V   .
30.417   1038.0308    336.90  .         .        Q.         .     V   .
30.500   1040.3284    333.61  .         .        Q.         .     V   .
30.583   1042.6035    330.35  .         .       Q .         .      V  .
30.667   1044.8567    327.16  .         .       Q .         .      V  .
30.750   1047.0884    324.04  .         .       Q .         .      V  .
30.833   1049.2988    320.96  .         .       Q .         .      V  .
30.917   1051.4883    317.91  .         .       Q .         .      V  .
31.000   1053.6510    314.02  .         .      Q  .         .      V  .
31.083   1055.7697    307.63  .         .      Q  .         .      V  .
31.167   1057.8337    299.71  .         .      Q  .         .      V  .
31.250   1059.8447    291.99  .         .     Q   .         .      V  .
31.333   1061.8040    284.47  .         .     Q   .         .      V  .
31.417   1063.7061    276.18  .         .    Q    .         .      V  .
31.500   1065.5400    266.30  .         .    Q    .         .      V  .
31.583   1067.3024    255.89  .         .   Q     .         .      V  .
31.667   1068.9957    245.88  .         .   Q     .         .       V .
31.750   1070.6229    236.27  .         .  Q      .         .       V .
31.833   1072.1865    227.04  .         . Q       .         .       V .
31.917   1073.6870    217.86  .         . Q       .         .       V .
32.000   1075.1246    208.74  .         .Q        .         .       V .
32.083   1076.5018    199.96  .         .Q        .         .       V .
32.167   1077.8212    191.56  .         Q         .         .       V .
32.250   1079.0851    183.51  .         Q         .         .       V .
32.333   1080.2959    175.80  .         Q         .         .       V .
32.417   1081.4558    168.42  .        Q.         .         .       V .
32.500   1082.5681    161.50  .        Q.         .         .       V .
32.583   1083.6361    155.08  .       Q .         .         .       V .
32.667   1084.6619    148.94  .       Q .         .         .       V .
32.750   1085.6471    143.05  .       Q .         .         .       V .
32.833   1086.5934    137.39  .      Q  .         .         .       V .
32.917   1087.5022    131.96  .      Q  .         .         .       V .
33.000   1088.3750    126.74  .      Q  .         .         .       V .
33.083   1089.2134    121.73  .     Q   .         .         .       V .
33.167   1090.0186    116.91  .     Q   .         .         .       V .
33.250   1090.7919    112.29  .     Q   .         .         .       V .
33.333   1091.5365    108.12  .     Q   .         .         .       V .
33.417   1092.2555    104.40  .    Q    .         .         .       V .
33.500   1092.9498    100.81  .    Q    .         .         .       V .
33.583   1093.6202     97.35  .    Q    .         .         .       V .
33.667   1094.2676     94.00  .    Q    .         .         .       V .
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33.750   1094.8927     90.77  .    Q    .         .         .       V .
33.833   1095.4963     87.65  .    Q    .         .         .       V .
33.917   1096.0792     84.64  .   Q     .         .         .       V .
34.000   1096.6421     81.74  .   Q     .         .         .       V .
34.083   1097.1857     78.93  .   Q     .         .         .        V.
34.167   1097.7106     76.22  .   Q     .         .         .        V.
34.250   1098.2174     73.60  .   Q     .         .         .        V.
34.333   1098.7069     71.07  .   Q     .         .         .        V.
34.417   1099.1796     68.63  .  Q      .         .         .        V.
34.500   1099.6360     66.27  .  Q      .         .         .        V.
34.583   1100.0776     64.12  .  Q      .         .         .        V.
34.667   1100.5060     62.20  .  Q      .         .         .        V.
34.750   1100.9218     60.38  .  Q      .         .         .        V.
34.833   1101.3254     58.61  .  Q      .         .         .        V.
34.917   1101.7173     56.89  .  Q      .         .         .        V.
35.000   1102.0977     55.22  .  Q      .         .         .        V.
35.083   1102.4668     53.60  .  Q      .         .         .        V.
35.167   1102.8252     52.03  . Q       .         .         .        V.
35.250   1103.1731     50.51  . Q       .         .         .        V.
35.333   1103.5107     49.03  . Q       .         .         .        V.
35.417   1103.8385     47.59  . Q       .         .         .        V.
35.500   1104.1566     46.20  . Q       .         .         .        V.
35.583   1104.4655     44.84  . Q       .         .         .        V.
35.667   1104.7653     43.53  . Q       .         .         .        V.
35.750   1105.0563     42.25  . Q       .         .         .        V.
35.833   1105.3387     41.01  . Q       .         .         .        V.
35.917   1105.6129     39.81  . Q       .         .         .        V.
36.000   1105.8790     38.64  . Q       .         .         .        V.
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```

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	2165.0
10%	1985.0
20%	1850.0
30%	1760.0
40%	1685.0
50%	1555.0
60%	1120.0
70%	800.0
80%	625.0
90%	495.0

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********************************************************************************
  FLOW PROCESS FROM NODE    376.00 TO NODE    410.00 IS CODE = 5.2
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  >>>>>MODEL CHANNEL ROUTING OF STREAM #1 BY THE CONVEX METHOD<<<<<
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THE MODIFIED C-ROUTING COEFFICIENT IS ESTIMATED IN ORDER
TO ROUTE THE STREAM 1 INFLOW HYDROGRAPH BY 5-MINUTE
INTERVALS(Reference: the National Engineering Handbook,
Hydrology, Chapter 17, page 17-52, August,1972,

U.S. Department of Commerce).

ASSUMED REGULAR CHANNEL INFORMATION:
  BASEWIDTH(FT) =   12.00   CHANNEL Z = 2.00
  UPSTREAM ELEVATION(FT) =   1600.00
  DOWNSTREAM ELEVATION(FT) =   1533.00
  CHANNEL LENGTH(FT) =   2846.26   MANNING'S FACTOR = 0.015
  CONSTANT LOSS RATE(CFS) =   0.00

CHANNEL ROUTING COEFFICIENT ESTIMATED:
  MAXIMUM INFLOW(CFS) =   614.44
  AVERAGE FLOWRATE IN EXCESS OF 50% MAXIMUM INFLOW =   462.56
  CHANNEL NORMAL VELOCITY FOR Q =   462.56 CFS = 18.25 FPS
  ESTIMATED CHANNEL ROUTING COEFFICIENT = 0.915

MODIFIED CHANNEL ROUTING COEFFICIENT FOR 5-MINUTE
UNIT INTERVALS IS CSTAR = 0.986

CONVEX METHOD CHANNEL ROUTING RESULTS:

MODEL TIME (HRS)	INFLOW (STREAM 1) (CFS)	ROUTED FLOW (CFS)	OUTFLOW LESS LOSS (STREAM 1) (CFS)
15.000	434.80	433.47	433.47
15.083	437.67	436.27	436.27
15.167	440.68	439.21	439.21
15.250	443.80	442.27	442.27
15.333	447.00	445.43	445.43
15.417	450.30	448.68	448.68
15.500	453.71	452.04	452.04
15.583	457.15	455.47	455.47
15.667	460.55	458.88	458.88
15.750	463.92	462.27	462.27
15.833	467.29	465.64	465.64
15.917	470.65	469.00	469.00
16.000	474.17	472.45	472.45
16.083	478.61	476.44	476.44
16.167	484.76	481.76	481.76
16.250	492.92	488.94	488.94
16.333	503.39	498.28	498.28
16.417	515.85	509.76	509.76
16.500	529.38	522.76	522.76
16.583	543.14	536.41	536.41
16.667	556.15	549.77	549.77
16.750	567.30	561.83	561.83
16.833	576.25	571.85	571.85
16.917	583.42	579.90	579.90
17.000	589.23	586.37	586.37
17.083	593.99	591.65	591.65
17.167	597.93	595.99	595.99
17.250	601.26	599.62	599.62
17.333	604.04	602.68	602.68
17.417	606.35	605.22	605.22
17.500	608.21	607.29	607.29
17.583	609.70	608.97	608.97

17.667	610.94	610.33	610.33
17.750	611.95	611.46	611.46
17.833	612.75	612.36	612.36
17.917	613.37	613.07	613.07
18.000	613.85	613.62	613.62
18.083	614.18	614.02	614.02
18.167	614.35	614.26	614.26
18.250	614.42	614.39	614.39
18.333	614.44	614.43	614.43
18.417	614.42	614.43	614.43
18.500	614.38	614.40	614.40
18.583	614.35	614.36	614.36
18.667	614.31	614.33	614.33
18.750	614.27	614.29	614.29
18.833	614.22	614.24	614.24
18.917	614.16	614.19	614.19
19.000	614.07	614.11	614.11
19.083	613.94	614.01	614.01
19.167	613.77	613.86	613.86
19.250	613.58	613.67	613.67
19.333	613.36	613.47	613.47
19.417	613.12	613.24	613.24
19.500	612.86	612.99	612.99
19.583	612.55	612.70	612.70
19.667	612.20	612.37	612.37
19.750	611.78	611.99	611.99
19.833	611.35	611.56	611.56
19.917	610.89	611.11	611.11
20.000	610.41	610.64	610.64

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  PROCESS SUMMARY OF STORAGE:
    INFLOW VOLUME =   1125.205 AF
    OUTFLOW VOLUME =   1125.207 AF
    LOSS   VOLUME =   0.000 AF

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  FLOW PROCESS FROM NODE   410.00 TO NODE   452.00 IS CODE = 5.2

  >>>>>MODEL CHANNEL ROUTING OF STREAM #1 BY THE CONVEX METHOD<<<<<

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THE MODIFIED C-ROUTING COEFFICIENT IS ESTIMATED IN ORDER
TO ROUTE THE STREAM 1 INFLOW HYDROGRAPH BY 5-MINUTE
INTERVALS(Reference: the National Engineering Handbook,
Hydrology, Chapter 17, page 17-52, August,1972,
U.S. Department of Commerce).

ASSUMED REGULAR CHANNEL INFORMATION:
  BASEWIDTH(FT) =   12.00   CHANNEL Z = 2.00
  UPSTREAM ELEVATION(FT) =   1533.00
  DOWNSTREAM ELEVATION(FT) =   1510.00
  CHANNEL LENGTH(FT) =   1329.02   MANNING'S FACTOR = 0.015
  CONSTANT LOSS RATE(CFS) =   0.00

CHANNEL ROUTING COEFFICIENT ESTIMATED:

MAXIMUM INFLOW(CFS) = 614.43
AVERAGE FLOWRATE IN EXCESS OF 50% MAXIMUM INFLOW = 463.06
CHANNEL NORMAL VELOCITY FOR Q = 463.06 CFS = 16.40 FPS
ESTIMATED CHANNEL ROUTING COEFFICIENT = 0.906

MODIFIED CHANNEL ROUTING COEFFICIENT FOR 5-MINUTE
UNIT INTERVALS IS CSTAR = 0.999

CONVEX METHOD CHANNEL ROUTING RESULTS:

MODEL TIME (HRS)	INFLOW (STREAM 1) (CFS)	ROUTED FLOW (CFS)	OUTFLOW LESS LOSS (STREAM 1) (CFS)
15.000	433.47	432.81	432.81
15.083	436.27	435.58	435.58
15.167	439.21	438.49	438.49
15.250	442.27	441.52	441.52
15.333	445.43	444.66	444.66
15.417	448.68	447.88	447.88
15.500	452.04	451.22	451.22
15.583	455.47	454.62	454.62
15.667	458.88	458.04	458.04
15.750	462.27	461.44	461.44
15.833	465.64	464.81	464.81
15.917	469.00	468.18	468.18
16.000	472.45	471.60	471.60
16.083	476.44	475.46	475.46
16.167	481.76	480.45	480.45
16.250	488.94	487.17	487.17
16.333	498.28	495.98	495.98
16.417	509.76	506.94	506.94
16.500	522.76	519.57	519.57
16.583	536.41	533.06	533.06
16.667	549.77	546.49	546.49
16.750	561.83	558.87	558.87
16.833	571.85	569.39	569.39
16.917	579.90	577.92	577.92
17.000	586.37	584.78	584.78
17.083	591.65	590.36	590.36
17.167	595.99	594.93	594.93
17.250	599.62	598.73	598.73
17.333	602.68	601.93	601.93
17.417	605.22	604.59	604.59
17.500	607.29	606.78	606.78
17.583	608.97	608.56	608.56
17.667	610.33	610.00	610.00
17.750	611.46	611.18	611.18
17.833	612.36	612.14	612.14
17.917	613.07	612.89	612.89
18.000	613.62	613.48	613.48
18.083	614.02	613.92	613.92
18.167	614.26	614.20	614.20
18.250	614.39	614.36	614.36
18.333	614.43	614.42	614.42
18.417	614.43	614.43	614.43
18.500	614.40	614.41	614.41
18.583	614.36	614.37	614.37

18.667	614.33	614.34	614.34
18.750	614.29	614.30	614.30
18.833	614.24	614.25	614.25
18.917	614.19	614.20	614.20
19.000	614.11	614.13	614.13
19.083	614.01	614.03	614.03
19.167	613.86	613.89	613.89
19.250	613.67	613.72	613.72
19.333	613.47	613.52	613.52
19.417	613.24	613.30	613.30
19.500	612.99	613.05	613.05
19.583	612.70	612.77	612.77
19.667	612.37	612.45	612.45
19.750	611.99	612.08	612.08
19.833	611.56	611.66	611.66
19.917	611.11	611.22	611.22
20.000	610.64	610.76	610.76

PROCESS SUMMARY OF STORAGE:
INFLOW VOLUME = 1125.207 AF
OUTFLOW VOLUME = 1125.206 AF
LOSS VOLUME = 0.000 AF

FLOW PROCESS FROM NODE 452.00 TO NODE 453.00 IS CODE = 5.2

>>>>>MODEL CHANNEL ROUTING OF STREAM #1 BY THE CONVEX METHOD<<<<<

THE MODIFIED C-ROUTING COEFFICIENT IS ESTIMATED IN ORDER
TO ROUTE THE STREAM 1 INFLOW HYDROGRAPH BY 5-MINUTE
INTERVALS(Reference: the National Engineering Handbook,
Hydrology, Chapter 17, page 17-52, August,1972,
U.S. Department of Commerce).

ASSUMED REGULAR CHANNEL INFORMATION:
BASEWIDTH(FT) = 12.00 CHANNEL Z = 2.00
UPSTREAM ELEVATION(FT) = 1510.00
DOWNSTREAM ELEVATION(FT) = 1440.00
CHANNEL LENGTH(FT) = 3395.49 MANNING'S FACTOR = 0.015
CONSTANT LOSS RATE(CFS) = 0.00

CHANNEL ROUTING COEFFICIENT ESTIMATED:
MAXIMUM INFLOW(CFS) = 614.43
AVERAGE FLOWRATE IN EXCESS OF 50% MAXIMUM INFLOW = 463.05
CHANNEL NORMAL VELOCITY FOR Q = 463.05 CFS = 17.48 FPS
ESTIMATED CHANNEL ROUTING COEFFICIENT = 0.911

MODIFIED CHANNEL ROUTING COEFFICIENT FOR 5-MINUTE
UNIT INTERVALS IS CSTAR = 0.971

CONVEX METHOD CHANNEL ROUTING RESULTS:

MODEL	INFLOW	ROUTED	OUTFLOW LESS LOSS

TIME (HRS)	(STREAM 1) FLOW (CFS)	FLOW (CFS)	(STREAM 1) (CFS)
15.000	432.81	431.18	431.18
15.083	435.58	433.87	433.87
15.167	438.49	436.69	436.69
15.250	441.52	439.64	439.64
15.333	444.66	442.71	442.71
15.417	447.88	445.88	445.88
15.500	451.22	449.15	449.15
15.583	454.62	452.51	452.51
15.667	458.04	455.92	455.92
15.750	461.44	459.33	459.33
15.833	464.81	462.72	462.72
15.917	468.18	466.09	466.09
16.000	471.60	469.48	469.48
16.083	475.46	473.08	473.08
16.167	480.45	477.38	477.38
16.250	487.17	483.04	483.04
16.333	495.98	490.56	490.56
16.417	506.94	500.19	500.19
16.500	519.57	511.77	511.77
16.583	533.06	524.71	524.71
16.667	546.49	538.16	538.16
16.750	558.87	551.18	551.18
16.833	569.39	562.83	562.83
16.917	577.92	572.60	572.60
17.000	584.78	580.50	580.50
17.083	590.36	586.88	586.88
17.167	594.93	592.07	592.07
17.250	598.73	596.36	596.36
17.333	601.93	599.93	599.93
17.417	604.59	602.93	602.93
17.500	606.78	605.42	605.42
17.583	608.56	607.45	607.45
17.667	610.00	609.10	609.10
17.750	611.18	610.44	610.44
17.833	612.14	611.54	611.54
17.917	612.89	612.42	612.42
18.000	613.48	613.11	613.11
18.083	613.92	613.65	613.65
18.167	614.20	614.02	614.02
18.250	614.36	614.26	614.26
18.333	614.42	614.38	614.38
18.417	614.43	614.42	614.42
18.500	614.41	614.42	614.42
18.583	614.37	614.39	614.39
18.667	614.34	614.36	614.36
18.750	614.30	614.32	614.32
18.833	614.25	614.28	614.28
18.917	614.20	614.23	614.23
19.000	614.13	614.17	614.17
19.083	614.03	614.09	614.09
19.167	613.89	613.98	613.98
19.250	613.72	613.83	613.83
19.333	613.52	613.64	613.64
19.417	613.30	613.43	613.43
19.500	613.05	613.20	613.20
19.583	612.77	612.94	612.94

19.667	612.45	612.65	612.65
19.750	612.08	612.31	612.31
19.833	611.66	611.92	611.92
19.917	611.22	611.50	611.50
20.000	610.76	611.05	611.05

PROCESS SUMMARY OF STORAGE:
INFLOW VOLUME = 1125.206 AF
OUTFLOW VOLUME = 1125.207 AF
LOSS VOLUME = 0.000 AF

****
FLOW PROCESS FROM NODE 453.00 TO NODE 454.00 IS CODE = 5.2

>>>>>MODEL CHANNEL ROUTING OF STREAM #1 BY THE CONVEX METHOD<<<<<
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THE MODIFIED C-ROUTING COEFFICIENT IS ESTIMATED IN ORDER
TO ROUTE THE STREAM 1 INFLOW HYDROGRAPH BY 5-MINUTE
INTERVALS(Reference: the National Engineering Handbook,
Hydrology, Chapter 17, page 17-52, August,1972,
U.S. Department of Commerce).

ASSUMED REGULAR CHANNEL INFORMATION:
BASEWIDTH(FT) = 12.00 CHANNEL Z = 2.00
UPSTREAM ELEVATION(FT) = 1440.00
DOWNSTREAM ELEVATION(FT) = 1395.00
CHANNEL LENGTH(FT) = 3128.68 MANNING'S FACTOR = 0.015
CONSTANT LOSS RATE(CFS) = 0.00

CHANNEL ROUTING COEFFICIENT ESTIMATED:
MAXIMUM INFLOW(CFS) = 614.42
AVERAGE FLOWRATE IN EXCESS OF 50% MAXIMUM INFLOW = 463.05
CHANNEL NORMAL VELOCITY FOR Q = 463.05 CFS = 15.43 FPS
ESTIMATED CHANNEL ROUTING COEFFICIENT = 0.901

MODIFIED CHANNEL ROUTING COEFFICIENT FOR 5-MINUTE
UNIT INTERVALS IS CSTAR = 0.963

CONVEX METHOD CHANNEL ROUTING RESULTS:

MODEL TIME (HRS)	INFLOW (STREAM 1) (CFS)	ROUTED FLOW (CFS)	OUTFLOW LESS LOSS (STREAM 1) (CFS)
15.000	431.18	429.52	429.52
15.083	433.87	432.13	432.13
15.167	436.69	434.87	434.87
15.250	439.64	437.73	437.73
15.333	442.71	440.73	440.73
15.417	445.88	443.84	443.84
15.500	449.15	447.04	447.04
15.583	452.51	450.34	450.34
15.667	455.92	453.72	453.72
15.750	459.33	457.13	457.13

15.833	462.72	460.53	460.53
15.917	466.09	463.91	463.91
16.000	469.48	467.29	467.29
16.083	473.08	470.75	470.75
16.167	477.38	474.61	474.61
16.250	483.04	479.41	479.41
16.333	490.56	485.74	485.74
16.417	500.19	494.01	494.01
16.500	511.77	504.32	504.32
16.583	524.71	516.37	516.37
16.667	538.16	529.47	529.47
16.750	551.18	542.74	542.74
16.833	562.83	555.26	555.26
16.917	572.60	566.23	566.23
17.000	580.50	575.34	575.34
17.083	586.88	582.71	582.71
17.167	592.07	588.68	588.68
17.250	596.36	593.56	593.56
17.333	599.93	597.60	597.60
17.417	602.93	600.98	600.98
17.500	605.42	603.79	603.79
17.583	607.45	606.12	606.12
17.667	609.10	608.02	608.02
17.750	610.44	609.56	609.56
17.833	611.54	610.82	610.82
17.917	612.42	611.84	611.84
18.000	613.11	612.66	612.66
18.083	613.65	613.30	613.30
18.167	614.02	613.78	613.78
18.250	614.26	614.10	614.10
18.333	614.38	614.30	614.30
18.417	614.42	614.39	614.39
18.500	614.42	614.42	614.42
18.583	614.39	614.41	614.41
18.667	614.36	614.38	614.38
18.750	614.32	614.35	614.35
18.833	614.28	614.31	614.31
18.917	614.23	614.26	614.26
19.000	614.17	614.21	614.21
19.083	614.09	614.14	614.14
19.167	613.98	614.05	614.05
19.250	613.83	613.92	613.92
19.333	613.64	613.76	613.76
19.417	613.43	613.57	613.57
19.500	613.20	613.35	613.35
19.583	612.94	613.11	613.11
19.667	612.65	612.84	612.84
19.750	612.31	612.53	612.53
19.833	611.92	612.17	612.17
19.917	611.50	611.77	611.77
20.000	611.05	611.34	611.34

PROCESS SUMMARY OF STORAGE:
INFLOW VOLUME = 1125.207 AF
OUTFLOW VOLUME = 1125.205 AF
LOSS VOLUME = 0.000 AF

FLOW PROCESS FROM NODE 454.00 TO NODE 454.00 IS CODE = 11

>>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<

STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 175.0 350.0 525.0 700.0
15.000	357.0809	429.52	. . V . Q . .
15.083	360.0570	432.13	. . V . Q . .
15.167	363.0520	434.87	. . V . Q . .
15.250	366.0667	437.73	. . V . Q . .
15.333	369.1020	440.73	. . V . Q . .
15.417	372.1587	443.84	. . V . Q . .
15.500	375.2375	447.04	. . V . Q . .
15.583	378.3390	450.34	. . V . Q . .
15.667	381.4638	453.72	. . V . Q . .
15.750	384.6121	457.13	. . V . Q . .
15.833	387.7838	460.53	. . V . Q . .
15.917	390.9787	463.91	. . V . Q . .
16.000	394.1969	467.29	. . V . Q . .
16.083	397.4390	470.75	. . V . Q . .
16.167	400.7077	474.61	. . V . Q . .
16.250	404.0094	479.41	. . V . Q . .
16.333	407.3547	485.74	. . V . Q . .
16.417	410.7570	494.01	. . V . Q . .
16.500	414.2303	504.32	. . V . Q . .
16.583	417.7866	516.37	. . V . Q. .
16.667	421.4330	529.47	. . V . Q .
16.750	425.1710	542.74	. . V . .Q .
16.833	428.9951	555.26	. . V . .Q .
16.917	432.8947	566.23	. . V . . Q .
17.000	436.8571	575.34	. . V . . Q .
17.083	440.8703	582.71	. . V . . Q .
17.167	444.9246	588.68	. . V . . Q .
17.250	449.0125	593.56	. . V . . Q .
17.333	453.1282	597.60	. . V . . Q .
17.417	457.2671	600.98	. . V . . Q .
17.500	461.4255	603.79	. . V . . Q .
17.583	465.5999	606.12	. . V . . Q .
17.667	469.7874	608.02	. . V . . Q .
17.750	473.9854	609.56	. . V . . Q .
17.833	478.1922	610.82	. . V . . Q .
17.917	482.4060	611.84	. . V . . Q .
18.000	486.6254	612.66	. . V . . Q .
18.083	490.8492	613.30	. . V . . Q .
18.167	495.0764	613.78	. . V . . Q .
18.250	499.3057	614.10	. . V . . Q .
18.333	503.5364	614.30	. . V . . Q .
18.417	507.7678	614.39	. . V . . Q .
18.500	511.9994	614.42	. . V . . Q .
18.583	516.2308	614.41	. . V . . Q .
18.667	520.4621	614.38	. . V . . Q .
18.750	524.6931	614.35	. . V . . Q .
18.833	528.9239	614.31	. . V . . Q .

```
  18.917    533.1544    614.26  .         .       V .         .    Q    .
  19.000    537.3845    614.21  .         .        V.         .    Q    .
  19.083    541.6141    614.14  .         .        V.         .    Q    .
  19.167    545.8431    614.05  .         .        V.         .    Q    .
  19.250    550.0713    613.92  .         .        V.         .    Q    .
  19.333    554.2983    613.76  .         .        V.         .    Q    .
  19.417    558.5239    613.57  .         .        V.         .    Q    .
  19.500    562.7481    613.35  .         .         V         .    Q    .
  19.583    566.9706    613.11  .         .         V         .    Q    .
  19.667    571.1913    612.84  .         .         V         .    Q    .
  19.750    575.4098    612.53  .         .         V         .    Q    .
  19.833    579.6259    612.17  .         .         V         .   Q     .
  19.917    583.8392    611.77  .         .         V         .   Q     .
  20.000    588.0495    611.34  .         .         V         .   Q     .
--------------------------------------------------------------------------------
   TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
   (Note: 100% of Peak Flow Rate estimate assumed to have
   an instantaneous time duration)

   Percentile of Estimated               Duration
       Peak Flow Rate                    (minutes)
   ======================              =========
              0%                        1205.0
             10%                        1205.0
             20%                        1205.0
             30%                        1205.0
             40%                        1205.0
             50%                        1205.0
             60%                        1125.0
             70%                         800.0
             80%                         625.0
             90%                         495.0


****************************************************************************
  FLOW PROCESS FROM NODE    454.00 TO NODE    454.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #2)

         WATERSHED AREA =    1003.900 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.620 HOURS
         VALLEY(DEVELOPED) S-GRAPH SELECTED
         MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) =  0.400
         LOW LOSS FRACTION = 0.410
         *HYDROGRAPH MODEL #1 SPECIFIED*

         SPECIFIED PEAK  5-MINUTES RAINFALL(INCH)=  0.46
         SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)=  0.95
         SPECIFIED PEAK  1-HOUR RAINFALL(INCH) =  1.25
         SPECIFIED PEAK  3-HOUR RAINFALL(INCH) =  2.03
         SPECIFIED PEAK  6-HOUR RAINFALL(INCH) =  2.75
         SPECIFIED PEAK 24-HOUR RAINFALL(INCH) =  5.99

         *USER SPECIFIED PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
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          5-MINUTE FACTOR = 0.960
         30-MINUTE FACTOR = 0.960
          1-HOUR FACTOR = 0.960
          3-HOUR FACTOR = 0.990
          6-HOUR FACTOR = 1.000
         24-HOUR FACTOR = 1.000

        UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
        UNIT INTERVAL PERCENTAGE OF LAG-TIME =  13.441



============================================================================
                     UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
        1                0.768               93.248
        2                2.499              210.199
        3                5.594              375.744
        4               11.677              738.525
        5               19.500              949.740
        6               28.097             1043.720
        7               38.214             1228.356
        8               50.095             1442.416
        9               61.025             1327.038
       10               71.026             1214.220
       11               78.505              908.033
       12               84.341              708.508
       13               88.606              517.885
       14               91.603              363.845
       15               94.072              299.668
       16               95.796              209.378
       17               96.963              141.633
       18               97.910              115.019
       19               98.256               42.006
       20               98.508               30.618
       21               98.760               30.575
       22               99.012               30.591
       23               99.264               30.575
       24               99.516               30.575
       25               99.768               30.575
       26              100.000               28.226


----------------------------------------------------------------------------
    TOTAL SOIL-LOSS VOLUME(ACRE-FEET) =     190.0641
    TOTAL STORM RUNOFF VOLUME(ACRE-FEET) =     310.8884
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2 4 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 275.0 550.0 825.0 1100.0
0.083	0.0044	0.64	Q . . . .
0.167	0.0188	2.09	Q . . . .
0.250	0.0511	4.69	Q . . . .
0.333	0.1186	9.79	Q . . . .
0.417	0.2313	16.36	Q . . . .
0.500	0.3938	23.59	Q . . . .
0.583	0.6149	32.12	VQ . . . .
0.667	0.9051	42.14	VQ . . . .
0.750	1.2590	51.38	VQ . . . .
0.833	1.6713	59.87	V Q . . . .
0.917	2.1277	66.27	V Q . . . .
1.000	2.6188	71.31	V Q . . . .
1.083	3.1357	75.05	V Q . . . .
1.167	3.6710	77.73	V Q . . . .
1.250	4.2218	79.98	V Q . . . .
1.333	4.7839	81.61	V Q . . . .
1.417	5.3541	82.78	V Q . . . .
1.500	5.9310	83.78	V Q . . . .
1.583	6.5114	84.27	V Q . . . .
1.667	7.0946	84.68	V Q . . . .
1.750	7.6807	85.10	V Q . . . .
1.833	8.2697	85.52	.V Q . . . .
1.917	8.8616	85.94	.V Q . . . .
2.000	9.4564	86.37	.V Q . . . .
2.083	10.0541	86.79	.V Q . . . .
2.167	10.6547	87.21	.V Q . . . .
2.250	11.2568	87.42	.V Q . . . .
2.333	11.8605	87.65	.V Q . . . .
2.417	12.4656	87.87	.V Q . . . .
2.500	13.0723	88.10	.V Q . . . .
2.583	13.6806	88.32	.V Q . . . .
2.667	14.2905	88.55	.V Q . . . .
2.750	14.9020	88.78	.V Q . . . .
2.833	15.5150	89.02	.V Q . . . .
2.917	16.1297	89.25	. VQ . . . .
3.000	16.7460	89.49	. VQ . . . .
3.083	17.3640	89.73	. VQ . . . .
3.167	17.9837	89.97	. VQ . . . .
3.250	18.6050	90.21	. VQ . . . .
3.333	19.2280	90.46	. VQ . . . .
3.417	19.8527	90.71	. VQ . . . .
3.500	20.4791	90.96	. VQ . . . .
3.583	21.1073	91.21	. VQ . . . .
3.667	21.7373	91.47	. VQ . . . .
3.750	22.3690	91.72	. VQ . . . .
3.833	23.0024	91.98	. VQ . . . .
3.917	23.6377	92.24	. Q . . . .

4.000	24.2749	92.51	. Q . . . .
4.083	24.9138	92.78	. Q . . . .
4.167	25.5546	93.05	. Q . . . .
4.250	26.1973	93.32	. Q . . . .
4.333	26.8419	93.59	. Q . . . .
4.417	27.4884	93.87	. Q . . . .
4.500	28.1368	94.15	. Q . . . .
4.583	28.7872	94.43	. Q . . . .
4.667	29.4396	94.72	. Q . . . .
4.750	30.0939	95.01	. Q . . . .
4.833	30.7502	95.30	. Q . . . .
4.917	31.4086	95.59	. QV . . . .
5.000	32.0690	95.89	. QV . . . .
5.083	32.7315	96.19	. QV . . . .
5.167	33.3961	96.50	. QV . . . .
5.250	34.0628	96.80	. QV . . . .
5.333	34.7316	97.12	. QV . . . .
5.417	35.4026	97.43	. QV . . . .
5.500	36.0758	97.75	. QV . . . .
5.583	36.7512	98.06	. QV . . . .
5.667	37.4288	98.39	. QV . . . .
5.750	38.1086	98.71	. QV . . . .
5.833	38.7908	99.05	. QV . . . .
5.917	39.4752	99.38	. Q V . . . .
6.000	40.1620	99.72	. Q V . . . .
6.083	40.8511	100.06	. Q V . . . .
6.167	41.5426	100.41	. Q V . . . .
6.250	42.2365	100.75	. Q V . . . .
6.333	42.9329	101.11	. Q V . . . .
6.417	43.6317	101.47	. Q V . . . .
6.500	44.3330	101.83	. Q V . . . .
6.583	45.0368	102.20	. Q V . . . .
6.667	45.7432	102.57	. Q V . . . .
6.750	46.4522	102.94	. Q V . . . .
6.833	47.1637	103.32	. Q V . . . .
6.917	47.8780	103.71	. Q V . . . .
7.000	48.5949	104.10	. Q V . . . .
7.083	49.3145	104.49	. Q V . . . .
7.167	50.0369	104.89	. Q V . . . .
7.250	50.7620	105.29	. Q V . . . .
7.333	51.4900	105.70	. Q V . . . .
7.417	52.2208	106.11	. Q V . . . .
7.500	52.9546	106.54	. Q V . . . .
7.583	53.6912	106.96	. Q V . . . .
7.667	54.4308	107.39	. Q V . . . .
7.750	55.1734	107.83	. Q V . . . .
7.833	55.9191	108.27	. Q V . . . .
7.917	56.6679	108.72	. Q V . . . .
8.000	57.4198	109.18	. Q V . . . .
8.083	58.1748	109.63	. Q V . . . .
8.167	58.9331	110.10	. Q V . . . .
8.250	59.6947	110.58	. Q V . . . .
8.333	60.4595	111.06	. Q V . . . .
8.417	61.2278	111.55	. Q V . . . .
8.500	61.9994	112.04	. Q V . . . .
8.583	62.7745	112.54	. Q V . . . .
8.667	63.5531	113.06	. Q V . . . .
8.750	64.3353	113.57	. Q V . . . .

8.833	65.1211	114.10	.	Q	V	.	.	.	.	.
8.917	65.9105	114.63	.	Q	V	.	.	.	.	.
9.000	66.7037	115.17	.	Q	V	.	.	.	.	.
9.083	67.5007	115.72	.	Q	V	.	.	.	.	.
9.167	68.3015	116.28	.	Q	V	.	.	.	.	.
9.250	69.1063	116.85	.	Q	V	.	.	.	.	.
9.333	69.9150	117.43	.	Q	V	.	.	.	.	.
9.417	70.7277	118.01	.	Q	V	.	.	.	.	.
9.500	71.5446	118.61	.	Q	V	.	.	.	.	.
9.583	72.3656	119.21	.	Q	V	.	.	.	.	.
9.667	73.1909	119.83	.	Q	V	.	.	.	.	.
9.750	74.0205	120.46	.	Q	V	.	.	.	.	.
9.833	74.8545	121.10	.	Q	V	.	.	.	.	.
9.917	75.6930	121.74	.	Q	V	.	.	.	.	.
10.000	76.5360	122.41	.	Q	V	.	.	.	.	.
10.083	77.3837	123.08	.	Q	V	.	.	.	.	.
10.167	78.2361	123.77	.	Q	V	.	.	.	.	.
10.250	79.0932	124.46	.	Q	V	.	.	.	.	.
10.333	79.9553	125.18	.	Q	V	.	.	.	.	.
10.417	80.8224	125.90	.	Q	V	.	.	.	.	.
10.500	81.6946	126.64	.	Q	V	.	.	.	.	.
10.583	82.5719	127.39	.	Q	V	.	.	.	.	.
10.667	83.4546	128.16	.	Q	V	.	.	.	.	.
10.750	84.3426	128.94	.	Q	V	.	.	.	.	.
10.833	85.2362	129.74	.	Q	V	.	.	.	.	.
10.917	86.1353	130.56	.	Q	.V	.	.	.	.	.
11.000	87.0403	131.39	.	Q	.V	.	.	.	.	.
11.083	87.9510	132.24	.	Q	.V	.	.	.	.	.
11.167	88.8678	133.11	.	Q	.V	.	.	.	.	.
11.250	89.7906	134.00	.	Q	.V	.	.	.	.	.
11.333	90.7198	134.91	.	Q	.V	.	.	.	.	.
11.417	91.6553	135.84	.	Q	.V	.	.	.	.	.
11.500	92.5973	136.79	.	Q	.V	.	.	.	.	.
11.583	93.5461	137.76	.	Q	. V	.	.	.	.	.
11.667	94.5017	138.76	.	Q	. V	.	.	.	.	.
11.750	95.4643	139.77	.	Q	. V	.	.	.	.	.
11.833	96.4342	140.82	.	Q	. V	.	.	.	.	.
11.917	97.4114	141.89	.	Q	. V	.	.	.	.	.
12.000	98.3962	142.99	.	Q	. V	.	.	.	.	.
12.083	99.3871	143.88	.	Q	. V	.	.	.	.	.
12.167	100.3825	144.53	.	Q	. V	.	.	.	.	.
12.250	101.3797	144.79	.	Q	. V	.	.	.	.	.
12.333	102.3728	144.20	.	Q	. V	.	.	.	.	.
12.417	103.3584	143.12	.	Q	. V	.	.	.	.	.
12.500	104.3354	141.85	.	Q	. V	.	.	.	.	.
12.583	105.3006	140.16	.	Q	. V	.	.	.	.	.
12.667	106.2510	137.99	.	Q	. V	.	.	.	.	.
12.750	107.1886	136.14	.	Q	. V	.	.	.	.	.
12.833	108.1158	134.63	.	Q	. V	.	.	.	.	.
12.917	109.0380	133.91	.	Q	. V	.	.	.	.	.
13.000	109.9591	133.74	.	Q	. V	.	.	.	.	.
13.083	110.8825	134.09	.	Q	. V	.	.	.	.	.
13.167	111.8115	134.89	.	Q	. V	.	.	.	.	.
13.250	112.7474	135.89	.	Q	. V	.	.	.	.	.
13.333	113.6924	137.20	.	Q	. V	.	.	.	.	.
13.417	114.6478	138.74	.	Q	. V	.	.	.	.	.
13.500	115.6150	140.43	.	Q	. V	.	.	.	.	.
13.583	116.5954	142.36	.	Q	. V	.	.	.	.	.

13.667	117.5902	144.44	.	Q	.	V	.	.	.	.
13.750	118.5997	146.58	.	Q	.	V	.	.	.	.
13.833	119.6248	148.85	.	Q	.	V	.	.	.	.
13.917	120.6662	151.20	.	Q	.	V	.	.	.	.
14.000	121.7247	153.70	.	Q	.	V	.	.	.	.
14.083	122.8015	156.36	.	Q	.	V	.	.	.	.
14.167	123.8983	159.25	.	Q	.	V	.	.	.	.
14.250	125.0169	162.42	.	Q	.	V	.	.	.	.
14.333	126.1601	166.00	.	Q	.	V	.	.	.	.
14.417	127.3299	169.84	.	Q	.	V	.	.	.	.
14.500	128.5280	173.98	.	Q	.	V	.	.	.	.
14.583	129.7567	178.40	.	Q	.	V	.	.	.	.
14.667	131.0186	183.23	.	Q	.	V	.	.	.	.
14.750	132.3149	188.23	.	Q	.	V	.	.	.	.
14.833	133.6477	193.52	.	Q	.	V	.	.	.	.
14.917	135.0178	198.94	.	Q	.	V	.	.	.	.
15.000	136.4275	204.69	.	Q	.	V	.	.	.	.
15.083	137.8788	210.73	.	Q	.	V	.	.	.	.
15.167	139.3750	217.25	.	Q	.	V	.	.	.	.
15.250	140.9196	224.28	.	Q	.	V	.	.	.	.
15.333	142.5176	232.03	.	Q	.	V	.	.	.	.
15.417	144.1712	240.11	.	Q	.	V	.	.	.	.
15.500	145.8843	248.74	.	Q	.	V	.	.	.	.
15.583	147.6597	257.79	.	Q	.	V	.	.	.	.
15.667	149.4978	266.89	.	Q	.	V	.	.	.	.
15.750	151.4065	277.14	.	Q	.	V	.	.	.	.
15.833	153.4036	289.97	.	Q	.	V	.	.	.	.
15.917	155.5209	307.44	.	Q	.	V	.	.	.	.
16.000	157.8253	334.60	.	Q	.	V	.	.	.	.
16.083	160.5945	402.09	.	Q	.	V	.	.	.	.
16.167	163.9657	489.48	.	Q	.	V	.	.	.	.
16.250	168.1277	604.33	.	Q	.	V	.	.	.	.
16.333	173.4829	777.58	.	Q	.	V	.	.	.	.
16.417	179.5989	888.04	.	Q	.	V	.	.	.	.
16.500	186.1652	953.42	.	Q	.	V	.	.	.	.
16.583	193.2895	1034.45	.	Q	.	V	.	.	.	.
16.667	200.8512	1097.96	.	Q	.	V	.	.	.	.
16.750	207.9387	1029.10	.	Q	.	V	.	.	.	.
16.833	214.4166	940.59	.	Q	.	V	.	.	.	.
16.917	219.8236	785.11	.	Q	.	V	.	.	.	.
17.000	224.4184	667.15	.	Q	.	V	.	.	.	.
17.083	228.2638	558.36	.	Q	.	V	.	.	.	.
17.167	231.5005	469.98	.	Q	.	V	.	.	.	.
17.250	234.3587	415.01	.	Q	.	V	.	.	.	.
17.333	236.8111	356.07	.	Q	.	V	.	.	.	.
17.417	238.9359	308.54	.	Q	.	V	.	.	.	.
17.500	240.8427	276.86	.	Q	.	V	.	.	.	.
17.583	242.4629	235.25	.	Q	.	V	.	.	.	.
17.667	243.9640	217.96	.	Q	.	V	.	.	.	.
17.750	245.3904	207.11	.	Q	.	V	.	.	.	.
17.833	246.7533	197.90	.	Q	.	V	.	.	.	.
17.917	248.0583	189.48	.	Q	.	V	.	.	.	.
18.000	249.3105	181.82	.	Q	.	V	.	.	.	.
18.083	250.5110	174.32	.	Q	.	V	.	.	.	.
18.167	251.6539	165.95	.	Q	.	V	.	.	.	.
18.250	252.6933	150.91	.	Q	.	V	.	.	.	.
18.333	253.7079	147.32	.	Q	.	V	.	.	.	.
18.417	254.7074	145.13	.	Q	.	V	.	.	.	.

```
 18.500    255.6969    143.68  .    Q    .         .         . V       .
 18.583    256.6816    142.97  .    Q    .         .         .  V      .
 18.667    257.6672    143.11  .    Q    .         .         .  V      .
 18.750    258.6535    143.21  .    Q    .         .         .  V      .
 18.833    259.6402    143.26  .    Q    .         .         .  V      .
 18.917    260.6233    142.75  .    Q    .         .         .  V      .
 19.000    261.6007    141.92  .    Q    .         .         .  V      .
 19.083    262.5702    140.76  .    Q    .         .         .  V      .
 19.167    263.5300    139.37  .    Q    .         .         .  V      .
 19.250    264.4801    137.95  .    Q    .         .         .   V     .
 19.333    265.4196    136.42  .   Q     .         .         .   V     .
 19.417    266.3481    134.82  .   Q     .         .         .   V     .
 19.500    267.2657    133.24  .   Q     .         .         .   V     .
 19.583    268.1719    131.57  .   Q     .         .         .   V     .
 19.667    269.0669    129.95  .   Q     .         .         .   V     .
 19.750    269.9512    128.40  .   Q     .         .         .   V     .
 19.833    270.8253    126.92  .   Q     .         .         .   V     .
 19.917    271.6896    125.49  .   Q     .         .         .   V     .
 20.000    272.5445    124.13  .   Q     .         .         .    V    .
 20.083    273.3903    122.82  .   Q     .         .         .    V    .
 20.167    274.2274    121.55  .   Q     .         .         .    V    .
 20.250    275.0557    120.26  .   Q     .         .         .    V    .
 20.333    275.8754    119.02  .   Q     .         .         .    V    .
 20.417    276.6867    117.81  .   Q     .         .         .    V    .
 20.500    277.4901    116.65  .   Q     .         .         .    V    .
 20.583    278.2857    115.52  .   Q     .         .         .    V    .
 20.667    279.0738    114.43  .   Q     .         .         .    V    .
 20.750    279.8546    113.37  .   Q     .         .         .     V   .
 20.833    280.6284    112.35  .   Q     .         .         .     V   .
 20.917    281.3953    111.35  .   Q     .         .         .     V   .
 21.000    282.1555    110.38  .   Q     .         .         .     V   .
 21.083    282.9092    109.44  .  Q      .         .         .     V   .
 21.167    283.6567    108.53  .  Q      .         .         .     V   .
 21.250    284.3980    107.64  .  Q      .         .         .     V   .
 21.333    285.1334    106.77  .  Q      .         .         .     V   .
 21.417    285.8629    105.93  .  Q      .         .         .     V   .
 21.500    286.5868    105.11  .  Q      .         .         .     V   .
 21.583    287.3052    104.31  .  Q      .         .         .     V   .
 21.667    288.0182    103.53  .  Q      .         .         .      V  .
 21.750    288.7259    102.76  .  Q      .         .         .      V  .
 21.833    289.4286    102.02  .  Q      .         .         .      V  .
 21.917    290.1262    101.29  .  Q      .         .         .      V  .
 22.000    290.8189    100.58  .  Q      .         .         .      V  .
 22.083    291.5069     99.89  .  Q      .         .         .      V  .
 22.167    292.1902     99.21  .  Q      .         .         .      V  .
 22.250    292.8689     98.55  .  Q      .         .         .      V  .
 22.333    293.5431     97.90  .  Q      .         .         .      V  .
 22.417    294.2130     97.27  .  Q      .         .         .      V  .
 22.500    294.8786     96.64  .  Q      .         .         .      V  .
 22.583    295.5400     96.04  .  Q      .         .         .       V .
 22.667    296.1973     95.44  .  Q      .         .         .       V .
 22.750    296.8505     94.85  .  Q      .         .         .       V .
 22.833    297.4998     94.28  .  Q      .         .         .       V .
 22.917    298.1453     93.72  .  Q      .         .         .       V .
 23.000    298.7870     93.17  .  Q      .         .         .       V .
 23.083    299.4249     92.63  .  Q      .         .         .       V .
 23.167    300.0592     92.10  .  Q      .         .         .       V .
 23.250    300.6900     91.58  .  Q      .         .         .       V .
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 23.333    301.3172     91.07  .  Q      .         .         .       V .
 23.417    301.9409     90.57  .  Q      .         .         .       V .
 23.500    302.5613     90.08  .  Q      .         .         .       V .
 23.583    303.1783     89.59  .  Q      .         .         .        V.
 23.667    303.7921     89.12  .  Q      .         .         .        V.
 23.750    304.4026     88.65  .  Q      .         .         .        V.
 23.833    305.0100     88.19  .  Q      .         .         .        V.
 23.917    305.6143     87.74  .  Q      .         .         .        V.
 24.000    306.2155     87.30  .  Q      .         .         .        V.
 24.083    306.8094     86.22  .  Q      .         .         .        V.
 24.167    307.3903     84.35  .  Q      .         .         .        V.
 24.250    307.9505     81.35  . Q       .         .         .        V.
 24.333    308.4730     75.87  . Q       .         .         .        V.
 24.417    308.9479     68.96  . Q       .         .         .        V.
 24.500    309.3711     61.44  . Q       .         .         .        V.
 24.583    309.7340     52.69  .Q        .         .         .        V.
 24.667    310.0268     42.51  .Q        .         .         .        V.
 24.750    310.2552     33.17  .Q        .         .         .        V.
 24.833    310.4250     24.66  Q         .         .         .        V.
 24.917    310.5510     18.29  Q         .         .         .        V.
 25.000    310.6427     13.32  Q         .         .         .        V.
 25.083    310.7095      9.69  Q         .         .         .        V.
 25.167    310.7587      7.14  Q         .         .         .        V.
 25.250    310.7934      5.04  Q         .         .         .        V.
 25.333    310.8181      3.58  Q         .         .         .        V.
 25.417    310.8359      2.59  Q         .         .         .        V.
 25.500    310.8482      1.78  Q         .         .         .        V.
 25.583    310.8584      1.49  Q         .         .         .        V.
 25.667    310.8671      1.27  Q         .         .         .        V.
 25.750    310.8744      1.05  Q         .         .         .        V.
 25.833    310.8801      0.84  Q         .         .         .        V.
 25.917    310.8844      0.62  Q         .         .         .        V.
 26.000    310.8872      0.41  Q         .         .         .        V.
 26.083    310.8885      0.20  Q         .         .         .         V
```

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1565.0
10%	775.0
20%	145.0
30%	85.0
40%	65.0
50%	55.0
60%	45.0
70%	40.0
80%	30.0
90%	15.0

****

FLOW PROCESS FROM NODE 454.00 TO NODE 454.00 IS CODE = 7

>>>>>STREAM NUMBER 2 ADDED TO STREAM NUMBER 1<<<<<

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================================================================================


********************************************************************************
  FLOW PROCESS FROM NODE    454.00 TO NODE    454.00 IS CODE =  11
--------------------------------------------------------------------------------
  >>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<
================================================================================

           STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
       (Note: Time indicated is at END of Each Unit Intervals)
--------------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.      425.0     850.0    1275.0    1700.0
--------------------------------------------------------------------------------
   0.083      0.0044      0.64  Q         .         .         .         .
   0.167      0.0189      2.10  Q         .         .         .         .
   0.250      0.0514      4.72  Q         .         .         .         .
   0.333      0.1196      9.90  Q         .         .         .         .
   0.417      0.2340     16.62  Q         .         .         .         .
   0.500      0.4002     24.13  Q         .         .         .         .
   0.583      0.6283     33.11  Q         .         .         .         .
   0.667      0.9298     43.79  VQ        .         .         .         .
   0.750      1.3011     53.92  VQ        .         .         .         .
   0.833      1.7386     63.52  VQ        .         .         .         .
   0.917      2.2294     71.27  VQ        .         .         .         .
   1.000      2.7671     78.08  VQ        .         .         .         .
   1.083      3.3479     84.33  VQ        .         .         .         .
   1.167      3.9704     90.38  V Q       .         .         .         .
   1.250      4.6359     96.63  V Q       .         .         .         .
   1.333      5.3431    102.70  V Q       .         .         .         .
   1.417      6.0943    109.07  V Q       .         .         .         .
   1.500      6.8969    116.54  V Q       .         .         .         .
   1.583      7.7554    124.65  V Q       .         .         .         .
   1.667      8.6725    133.16  V  Q      .         .         .         .
   1.750      9.6490    141.78  V  Q      .         .         .         .
   1.833     10.6862    150.60  V  Q      .         .         .         .
   1.917     11.7859    159.68  V  Q      .         .         .         .
   2.000     12.9490    168.88  V  Q      .         .         .         .
   2.083     14.1751    178.03  V   Q     .         .         .         .
   2.167     15.4633    187.06  V   Q     .         .         .         .
   2.250     16.8127    195.93  V   Q     .         .         .         .
   2.333     18.2243    204.97  V   Q     .         .         .         .
   2.417     19.6987    214.07  V    Q    .         .         .         .
   2.500     21.2349    223.06  V    Q    .         .         .         .
   2.583     22.8312    231.79  V    Q    .         .         .         .
   2.667     24.4862    240.29  V    Q    .         .         .         .
   2.750     26.1983    248.61  V    Q    .         .         .         .
   2.833     27.9671    256.83  V     Q   .         .         .         .
   2.917     29.7918    264.94  V     Q   .         .         .         .
   3.000     31.6709    272.86  V     Q   .         .         .         .
   3.083     33.6030    280.54  V     Q   .         .         .         .
   3.167     35.5863    287.98  V     Q   .         .         .         .
   3.250     37.6192    295.17  .V    Q   .         .         .         .
   3.333     39.7000    302.13  .V     Q  .         .         .         .
   3.417     41.8267    308.80  .V     Q  .         .         .         .
   3.500     43.9970    315.13  .V     Q  .         .         .         .
   3.583     46.2087    321.14  .V     Q  .         .         .         .
   3.667     48.4601    326.90  .V     Q  .         .         .         .
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   3.750     50.7500    332.49  .V     Q  .         .         .         .
   3.833     53.0772    337.92  .V     Q  .         .         .         .
   3.917     55.4408    343.19  .V      Q .         .         .         .
   4.000     57.8396    348.31  .V      Q .         .         .         .
   4.083     60.2727    353.28  .V      Q .         .         .         .
   4.167     62.7391    358.12  .V      Q .         .         .         .
   4.250     65.2377    362.79  .V      Q .         .         .         .
   4.333     67.7664    367.17  .V      Q .         .         .         .
   4.417     70.3220    371.07  .V      Q .         .         .         .
   4.500     72.9007    374.44  . V     Q .         .         .         .
   4.583     75.5004    377.47  . V     Q .         .         .         .
   4.667     78.1201    380.37  . V     Q .         .         .         .
   4.750     80.7593    383.22  . V      Q.         .         .         .
   4.833     83.4179    386.03  . V      Q.         .         .         .
   4.917     86.0956    388.81  . V      Q.         .         .         .
   5.000     88.7923    391.56  . V      Q.         .         .         .
   5.083     91.5077    394.27  . V      Q.         .         .         .
   5.167     94.2415    396.96  . V      Q.         .         .         .
   5.250     96.9937    399.62  . V      Q.         .         .         .
   5.333     99.7641    402.25  . V      Q.         .         .         .
   5.417    102.5523    404.86  . V      Q.         .         .         .
   5.500    105.3582    407.42  . V      Q.         .         .         .
   5.583    108.1809    409.85  .  V     Q.         .         .         .
   5.667    111.0180    411.95  .  V     Q.         .         .         .
   5.750    113.8666    413.61  .  V     Q.         .         .         .
   5.833    116.7242    414.92  .  V     Q.         .         .         .
   5.917    119.5898    416.09  .  V     Q.         .         .         .
   6.000    122.4633    417.23  .  V     Q.         .         .         .
   6.083    125.3447    418.38  .  V     Q.         .         .         .
   6.167    128.2340    419.53  .  V     Q.         .         .         .
   6.250    131.1314    420.69  .  V     Q.         .         .         .
   6.333    134.0368    421.86  .  V     Q.         .         .         .
   6.417    136.9502    423.04  .  V     Q.         .         .         .
   6.500    139.8719    424.22  .  V     Q.         .         .         .
   6.583    142.8017    425.41  .  V      Q         .         .         .
   6.667    145.7397    426.61  .   V     Q         .         .         .
   6.750    148.6860    427.81  .   V     Q         .         .         .
   6.833    151.6407    429.02  .   V     Q         .         .         .
   6.917    154.6038    430.24  .   V     Q         .         .         .
   7.000    157.5754    431.47  .   V     Q         .         .         .
   7.083    160.5555    432.71  .   V     Q         .         .         .
   7.167    163.5443    433.97  .   V     Q         .         .         .
   7.250    166.5418    435.25  .   V     Q         .         .         .
   7.333    169.5483    436.53  .   V     Q         .         .         .
   7.417    172.5636    437.83  .   V     Q         .         .         .
   7.500    175.5879    439.13  .   V     Q         .         .         .
   7.583    178.6213    440.44  .   V     Q         .         .         .
   7.667    181.6638    441.77  .    V    Q         .         .         .
   7.750    184.7154    443.10  .    V    Q         .         .         .
   7.833    187.7764    444.45  .    V    Q         .         .         .
   7.917    190.8466    445.80  .    V    Q         .         .         .
   8.000    193.9263    447.17  .    V    Q         .         .         .
   8.083    197.0154    448.54  .    V    Q         .         .         .
   8.167    200.1140    449.93  .    V    Q         .         .         .
   8.250    203.2223    451.32  .    V    Q         .         .         .
   8.333    206.3404    452.74  .    V    Q         .         .         .
   8.417    209.4682    454.16  .    V    Q         .         .         .
   8.500    212.6060    455.61  .    V    Q         .         .         .
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8.583	215.7538	457.06	.	V	Q	.	.	.
8.667	218.9118	458.54	.	V	Q	.	.	.
8.750	222.0800	460.02	.	V	Q	.	.	.
8.833	225.2585	461.52	.	V	Q	.	.	.
8.917	228.4475	463.04	.	V	Q	.	.	.
9.000	231.6470	464.57	.	V	Q	.	.	.
9.083	234.8571	466.11	.	V	Q	.	.	.
9.167	238.0780	467.67	.	V	.Q	.	.	.
9.250	241.3097	469.24	.	V	.Q	.	.	.
9.333	244.5523	470.84	.	V	.Q	.	.	.
9.417	247.8061	472.44	.	V	.Q	.	.	.
9.500	251.0710	474.07	.	V	.Q	.	.	.
9.583	254.3471	475.69	.	V	.Q	.	.	.
9.667	257.6339	477.24	.	V	.Q	.	.	.
9.750	260.9303	478.64	.	V	.Q	.	.	.
9.833	264.2354	479.90	.	V	.Q	.	.	.
9.917	267.5486	481.09	.	V	.Q	.	.	.
10.000	270.8701	482.29	.	V	.Q	.	.	.
10.083	274.2000	483.50	.	V	.Q	.	.	.
10.167	277.5384	484.73	.	V	.Q	.	.	.
10.250	280.8854	485.98	.	V	.Q	.	.	.
10.333	284.2411	487.26	.	V	.Q	.	.	.
10.417	287.6058	488.55	.	V	.Q	.	.	.
10.500	290.9796	489.87	.	V	.Q	.	.	.
10.583	294.3625	491.20	.	V	.Q	.	.	.
10.667	297.7550	492.59	.	V	.Q	.	.	.
10.750	301.1580	494.11	.	V	.Q	.	.	.
10.833	304.5737	495.96	.	V	.Q	.	.	.
10.917	308.0048	498.20	.	V	.Q	.	.	.
11.000	311.4533	500.71	.	V	.Q	.	.	.
11.083	314.9198	503.34	.	V	.Q	.	.	.
11.167	318.4048	506.02	.	V	.Q	.	.	.
11.250	321.9084	508.72	.	V	.Q	.	.	.
11.333	325.4309	511.46	.	V	.Q	.	.	.
11.417	328.9724	514.23	.	V	.Q	.	.	.
11.500	332.5332	517.03	.	V	.Q	.	.	.
11.583	336.1135	519.86	.	V	.Q	.	.	.
11.667	339.7136	522.73	.	V	.Q	.	.	.
11.750	343.3332	525.56	.	V	.Q	.	.	.
11.833	346.9715	528.29	.	V	.Q	.	.	.
11.917	350.6273	530.82	.	V	.Q	.	.	.
12.000	354.2997	533.24	.	V	.Q	.	.	.
12.083	357.9870	535.40	.	V	.Q	.	.	.
12.167	361.6875	537.31	.	V	Q	.	.	.
12.250	365.3985	538.84	.	V	Q	.	.	.
12.333	369.1142	539.52	.	V	Q	.	.	.
12.417	372.8310	539.68	.	V	Q	.	.	.
12.500	376.5472	539.60	.	V	Q	.	.	.
12.583	380.2595	539.02	.	V	Q	.	.	.
12.667	383.9639	537.88	.	V	Q	.	.	.
12.750	387.6619	536.95	.	V	Q	.	.	.
12.833	391.3551	536.26	.	V	Q	.	.	.
12.917	395.0484	536.26	.	V	Q	.	.	.
13.000	398.7451	536.75	.	V	Q	.	.	.
13.083	402.4483	537.71	.	V	Q	.	.	.
13.167	406.1611	539.10	.	V	Q	.	.	.
13.250	409.8848	540.69	.	V	Q	.	.	.
13.333	413.6216	542.58	.	V	Q	.	.	.

13.417	417.3731	544.72	.	V	Q	.	.	.
13.500	421.1406	547.04	.	V	Q	.	.	.
13.583	424.9258	549.62	.	V	Q	.	.	.
13.667	428.7301	552.37	.	V	Q	.	.	.
13.750	432.5540	555.24	.	V	Q	.	.	.
13.833	436.3988	558.26	.	V	Q	.	.	.
13.917	440.2653	561.42	.	V	Q	.	.	.
14.000	444.1549	564.76	.	V	Q	.	.	.
14.083	448.0688	568.31	.	V	Q	.	.	.
14.167	452.0093	572.15	.	V	Q	.	.	.
14.250	455.9786	576.34	.	V	Q	.	.	.
14.333	459.9801	581.02	.	V	Q	.	.	.
14.417	464.0164	586.07	.	V	Q	.	.	.
14.500	468.0903	591.53	.	V	Q	.	.	.
14.583	472.2049	597.45	.	V	Q	.	.	.
14.667	476.3644	603.96	.	V	Q	.	.	.
14.750	480.5714	610.85	.	V	Q	.	.	.
14.833	484.8293	618.25	.	V	Q	.	.	.
14.917	489.1404	625.98	.	V	Q	.	.	.
15.000	493.5082	634.20	.	V	Q	.	.	.
15.083	497.9356	642.86	.	V	Q	.	.	.
15.167	502.4268	652.12	.	V	Q	.	.	.
15.250	506.9861	662.01	.	V	Q	.	.	.
15.333	511.6194	672.76	.	V	Q	.	.	.
15.417	516.3298	683.94	.	V	Q	.	.	.
15.500	521.1217	695.78	.	V	Q	.	.	.
15.583	525.9986	708.13	.	V	Q	.	.	.
15.667	530.9615	720.61	.	V	Q	.	.	.
15.750	536.0184	734.27	.	V	Q	.	.	.
15.833	541.1872	750.50	.	V	Q	.	.	.
15.917	546.4995	771.35	.	V	Q	.	.	.
16.000	552.0222	801.89	.	V	Q	.	.	.
16.083	558.0334	872.84	.	V	Q	.	.	.
16.167	564.6732	964.10	.	V	Q	.	.	.
16.250	572.1370	1083.74	.	V	Q	.	.	.
16.333	580.8375	1263.31	.	V	Q	.	.	.
16.417	590.3557	1382.05	.	V	Q	.	.	.
16.500	600.3953	1457.75	.	V	Q	.	.	.
16.583	611.0759	1550.82	.	V	Q	.	.	.
16.667	622.2841	1627.43	.	V	Q	.	.	.
16.750	633.1095	1571.84	.	V	Q	.	.	.
16.833	643.4114	1495.84	.	V	Q	.	.	.
16.917	652.7182	1351.34	.	V	Q	.	.	.
17.000	661.2753	1242.49	.	V	Q	.	.	.
17.083	669.1339	1141.07	.	V	Q	.	.	.
17.167	676.4249	1058.66	.	V	Q	.	.	.
17.250	683.3710	1008.58	.	V	Q	.	.	.
17.333	689.9390	953.68	.	V	Q	.	.	.
17.417	696.2029	909.51	.	V	Q	.	.	.
17.500	702.2680	880.66	.	V	Q	.	.	.
17.583	708.0626	841.37	.	V	Q	.	.	.
17.667	713.7512	825.98	.	V	Q	.	.	.
17.750	719.3757	816.68	.	V	Q	.	.	.
17.833	724.9454	808.72	.	V	Q	.	.	.
17.917	730.4642	801.33	.	V	Q	.	.	.
18.000	735.9358	794.48	.	V	Q	.	.	.
18.083	741.3601	787.61	.	V	Q	.	.	.
18.167	746.7302	779.73	.	V	Q	.	.	.

18.250	751.9989	765.02	.	.	Q	V	.	.		
18.333	757.2442	761.62	.	.	Q	.V	.	.		
18.417	762.4751	759.53	.	.	Q	.V	.	.		
18.500	767.6962	758.10	.	.	Q	.V	.	.		
18.583	772.9123	757.38	.	.	Q	.V	.	.		
18.667	778.1292	757.49	.	.	Q	.V	.	.		
18.750	783.3465	757.56	.	.	Q	.V	.	.		
18.833	788.5639	757.57	.	.	Q	.V	.	.		
18.917	793.7775	757.01	.	.	Q	. V	.	.		
19.000	798.9850	756.13	.	.	Q	. V	.	.		
19.083	804.1841	754.91	.	.	Q	. V	.	.		
19.167	809.3730	753.42	.	.	Q	. V	.	.		
19.250	814.5511	751.87	.	.	Q	. V	.	.		
19.333	819.7177	750.18	.	.	Q	. V	.	.		
19.417	824.8718	748.38	.	.	Q	. V	.	.		
19.500	830.0137	746.59	.	.	Q	. V	.	.		
19.583	835.1423	744.68	.	.	Q	. V	.	.		
19.667	840.2579	742.79	.	.	Q	. V	.	.		
19.750	845.3607	740.93	.	.	Q	. V	.	.		
19.833	850.4509	739.09	.	.	Q	. V	.	.		
19.917	855.5284	737.26	.	.	Q	. V	.	.		
20.000	860.5936	735.46	.	.	Q	. V	.	.		
20.083	865.6466	733.70	.	.	Q	. V	.	.		
20.167	870.6876	731.95	.	.	Q	. V	.	.		
20.250	875.7163	730.17	.	.	Q	. V	.	.		
20.333	880.7329	728.41	.	.	Q	. V	.	.		
20.417	885.7375	726.67	.	.	Q	. V	.	.		
20.500	890.7304	724.96	.	.	Q	. V	.	.		
20.583	895.7116	723.27	.	.	Q	. V	.	.		
20.667	900.6813	721.60	.	.	Q	. V	.	.		
20.750	905.6396	719.95	.	.	Q	. V	.	.		
20.833	910.5866	718.31	.	.	Q	. V	.	.		
20.917	915.5225	716.69	.	.	Q	. V	.	.		
21.000	920.4473	715.08	.	.	Q	. V	.	.		
21.083	925.3611	713.48	.	.	Q	. V	.	.		
21.167	930.2639	711.89	.	.	Q	. V	.	.		
21.250	935.1558	710.31	.	.	Q	. V	.	.		
21.333	940.0369	708.73	.	.	Q	. V	.	.		
21.417	944.9070	707.15	.	.	Q	. V	.	.		
21.500	949.7663	705.57	.	.	Q	. V	.	.		
21.583	954.6146	703.98	.	.	Q	. V	.	.		
21.667	959.4521	702.40	.	.	Q	. V	.	.		
21.750	964.2787	700.83	.	.	Q	. V	.	.		
21.833	969.0947	699.27	.	.	Q	. V	.	.		
21.917	973.8999	697.72	.	.	Q	. V	.	.		
22.000	978.6945	696.17	.	.	Q	. V	.	.		
22.083	983.4785	694.63	.	.	Q	. V	.	.		
22.167	988.2518	693.08	.	.	Q	. V	.	.		
22.250	993.0144	691.54	.	.	Q	. V	.	.		
22.333	997.7664	690.00	.	.	Q	. V	.	.		
22.417	1002.5079	688.46	.	.	Q	. V	.	.		
22.500	1007.2388	686.93	.	.	Q	. V	.	.		
22.583	1011.9592	685.41	.	.	Q	. V	.	.		
22.667	1016.6693	683.89	.	.	Q	. V	.	.		
22.750	1021.3688	682.38	.	.	Q	. V	.	.		
22.833	1026.0581	680.88	.	.	Q	. V	.	.		
22.917	1030.7371	679.38	.	.	Q	. V	.	.		
23.000	1035.4056	677.88	.	.	Q	. V	.	.		

23.083	1040.0640	676.38	.	.	Q	.	V	.	.	
23.167	1044.7119	674.88	.	.	Q	.	V.	.	.	
23.250	1049.3495	673.37	.	.	Q	.	V.	.	.	
23.333	1053.9767	671.87	.	.	Q	.	V.	.	.	
23.417	1058.5936	670.37	.	.	Q	.	V.	.	.	
23.500	1063.2002	668.88	.	.	Q	.	V.	.	.	
23.583	1067.7966	667.40	.	.	Q	.	V.	.	.	
23.667	1072.3828	665.91	.	.	Q	.	V.	.	.	
23.750	1076.9589	664.44	.	.	Q	.	V.	.	.	
23.833	1081.5248	662.96	.	.	Q	.	V	.	.	
23.917	1086.0804	661.49	.	.	Q	.	V	.	.	
24.000	1090.6260	660.01	.	.	Q	.	V	.	.	
24.083	1095.1569	657.88	.	.	Q	.	V	.	.	
24.167	1099.6676	654.95	.	.	Q	.	V	.	.	
24.250	1104.1503	650.88	.	.	Q	.	V	.	.	
24.333	1108.5875	644.28	.	.	Q	.	V	.	.	
24.417	1112.9690	636.20	.	.	Q	.	V	.	.	
24.500	1117.2899	627.39	.	.	Q	.	.V	.	.	
24.583	1121.5406	617.21	.	.	Q	.	.V	.	.	
24.667	1125.7102	605.42	.	.	Q	.	.V	.	.	
24.750	1129.8030	594.27	.	.	Q	.	.V	.	.	
24.833	1133.8232	583.75	.	.	Q	.	.V	.	.	
24.917	1137.7847	575.20	.	.	Q	.	.V	.	.	
25.000	1141.6959	567.91	.	.	Q	.	.V	.	.	
25.083	1145.5653	561.84	.	.	Q	.	.V	.	.	
25.167	1149.3997	556.75	.	.	Q	.	. V	.	.	
25.250	1153.2015	552.02	.	. Q		.	. V	.	.	
25.333	1156.9749	547.88	.	. Q		.	. V	.	.	
25.417	1160.7225	544.16	.	. Q		.	. V	.	.	
25.500	1164.4454	540.57	.	. Q		.	. V	.	.	
25.583	1168.1469	537.44	.	. Q		.	. V	.	.	
25.667	1171.8271	534.37	.	. Q		.	. V	.	.	
25.750	1175.4861	531.27	.	. Q		.	. V	.	.	
25.833	1179.1234	528.14	.	. Q		.	. V	.	.	
25.917	1182.7390	524.99	.	. Q		.	. V	.	.	
26.000	1186.3328	521.82	.	. Q		.	. V	.	.	
26.083	1189.9045	518.63	.	. Q		.	. V	.	.	
26.167	1193.4542	515.42	.	. Q		.	. V	.	.	
26.250	1196.9830	512.39	.	. Q		.	. V	.	.	
26.333	1200.4910	509.35	.	.Q		.	. V	.	.	
26.417	1203.9778	506.28	.	.Q		.	. V	.	.	
26.500	1207.4432	503.19	.	.Q		.	. V	.	.	
26.583	1210.8873	500.08	.	.Q		.	. V	.	.	
26.667	1214.3099	496.96	.	.Q		.	. V	.	.	
26.750	1217.7108	493.81	.	.Q		.	. V	.	.	
26.833	1221.0900	490.65	.	.Q		.	. V	.	.	
26.917	1224.4471	487.47	.	.Q		.	. V	.	.	
27.000	1227.7823	484.28	.	.Q		.	. V	.	.	
27.083	1231.0955	481.06	.	.Q		.	. V	.	.	
27.167	1234.3862	477.82	.	.Q		.	. V	.	.	
27.250	1237.6547	474.58	.	.Q		.	. V	.	.	
27.333	1240.9006	471.32	.	.Q		.	. V	.	.	
27.417	1244.1240	468.04	.	.Q		.	. V	.	.	
27.500	1247.3247	464.74	.	Q		.	. V	.	.	
27.583	1250.5026	461.43	.	Q		.	. V	.	.	
27.667	1253.6577	458.12	.	Q		.	. V	.	.	
27.750	1256.7898	454.78	.	Q		.	. V	.	.	
27.833	1259.8988	451.43	.	Q		.	. V	.	.	

27.917	1262.9846	448.07	.	Q	.	.	V	.	
28.000	1266.0472	444.70	.	Q	.	.	V	.	
28.083	1269.0865	441.30	.	Q	.	.	V	.	
28.167	1272.1023	437.89	.	Q	.	.	V	.	
28.250	1275.0945	434.47	.	Q	.	.	V	.	
28.333	1278.0631	431.05	.	Q	.	.	V	.	
28.417	1281.0081	427.61	.	Q	.	.	V	.	
28.500	1283.9292	424.15	.	Q.	.	.	V	.	
28.583	1286.8265	420.70	.	Q.	.	.	V	.	
28.667	1289.7001	417.24	.	Q.	.	.	V	.	
28.750	1292.5497	413.75	.	Q.	.	.	V	.	
28.833	1295.3751	410.26	.	Q.	.	.	V	.	
28.917	1298.1765	406.77	.	Q.	.	.	V	.	
29.000	1300.9539	403.27	.	Q.	.	.	V	.	
29.083	1303.7069	399.75	.	Q.	.	.	V	.	
29.167	1306.4357	396.21	.	Q.	.	.	V	.	
29.250	1309.1395	392.59	.	Q.	.	.	V	.	
29.333	1311.8163	388.66	.	Q.	.	.	V	.	
29.417	1314.4619	384.14	.	Q.	.	.	V	.	
29.500	1317.0728	379.09	.	Q .	.	.	V	.	
29.583	1319.6481	373.93	.	Q .	.	.	V	.	
29.667	1322.1913	369.27	.	Q .	.	.	V	.	
29.750	1324.7098	365.70	.	Q .	.	.	V	.	
29.833	1327.2113	363.21	.	Q .	.	.	V	.	
29.917	1329.6993	361.26	.	Q .	.	.	V	.	
30.000	1332.1736	359.27	.	Q .	.	.	V	.	
30.083	1334.6311	356.83	.	Q .	.	.	V	.	
30.167	1337.0680	353.84	.	Q .	.	.	V	.	
30.250	1339.4818	350.49	.	Q .	.	.	V	.	
30.333	1341.8719	347.05	.	Q .	.	.	V	.	
30.417	1344.2385	343.63	.	Q .	.	.	V	.	
30.500	1346.5819	340.25	.	Q .	.	.	V	.	
30.583	1348.9023	336.92	.	Q .	.	.	V	.	
30.667	1351.2001	333.63	.	Q .	.	.	V	.	
30.750	1353.4755	330.39	.	Q .	.	.	V	.	
30.833	1355.7289	327.20	.	Q .	.	.	V	.	
30.917	1357.9608	324.07	.	Q .	.	.	V	.	
31.000	1360.1711	320.93	.	Q .	.	.	V	.	
31.083	1362.3575	317.47	.	Q .	.	.	V	.	
31.167	1364.5129	312.96	.	Q .	.	.	V	.	
31.250	1366.6267	306.92	.	Q .	.	.	V	.	
31.333	1368.6908	299.70	.	Q .	.	.	V	.	
31.417	1370.7021	292.04	.	Q .	.	.	V	.	
31.500	1372.6589	284.13	.	Q .	.	.	V	.	
31.583	1374.5565	275.53	.	Q .	.	.	V	.	
31.667	1376.3888	266.04	.	Q .	.	.	V	.	
31.750	1378.1522	256.04	.	Q .	.	.	V	.	
31.833	1379.8472	246.10	.	Q .	.	.	V	.	
31.917	1381.4757	236.47	.	Q .	.	.	V	.	
32.000	1383.0398	227.11	.	Q .	.	.	V	.	
32.083	1384.5406	217.93	.	Q .	.	.	V	.	
32.167	1385.9795	208.91	.	Q .	.	.	V	.	
32.250	1387.3580	200.17	.	Q .	.	.	V	.	
32.333	1388.6787	191.76	.	Q .	.	.	V	.	
32.417	1389.9438	183.70	.	Q .	.	.	V	.	
32.500	1391.1559	175.99	.	Q .	.	.	V	.	
32.583	1392.3175	168.66	.	Q .	.	.	V	.	
32.667	1393.4315	161.75	.	Q .	.	.	V	.	

32.750	1394.5007	155.25	.	Q .	.	.	.	V .	
32.833	1395.5275	149.08	.	Q .	.	.	.	V .	
32.917	1396.5135	143.18	.	Q .	.	.	.	V .	
33.000	1397.4607	137.52	.	Q .	.	.	.	V .	
33.083	1398.3704	132.08	.	Q .	.	.	.	V .	
33.167	1399.2440	126.85	.	Q .	.	.	.	V .	
33.250	1400.0831	121.84	.	Q .	.	.	.	V .	
33.333	1400.8892	117.03	.	Q .	.	.	.	V.	
33.417	1401.6639	112.51	.	Q .	.	.	.	V.	
33.500	1402.4100	108.33	.	Q .	.	.	.	V.	
33.583	1403.1296	104.49	.	Q .	.	.	.	V.	
33.667	1403.8245	100.88	.	Q .	.	.	.	V.	
33.750	1404.4954	97.41	.	Q .	.	.	.	V.	
33.833	1405.1432	94.07	.	Q .	.	.	.	V.	
33.917	1405.7688	90.84	.	Q .	.	.	.	V.	
34.000	1406.3729	87.72	.	Q .	.	.	.	V.	
34.083	1406.9563	84.70	.Q	.	.	.	.	V.	
34.167	1407.5197	81.79	.Q	.	.	.	.	V.	
34.250	1408.0636	78.98	.Q	.	.	.	.	V.	
34.333	1408.5889	76.27	.Q	.	.	.	.	V.	
34.417	1409.0961	73.65	.Q	.	.	.	.	V.	
34.500	1409.5858	71.12	.Q	.	.	.	.	V.	
34.583	1410.0588	68.68	.Q	.	.	.	.	V.	
34.667	1410.5160	66.37	.Q	.	.	.	.	V.	
34.750	1410.9584	64.23	.Q	.	.	.	.	V.	
34.833	1411.3872	62.26	.Q	.	.	.	.	V.	
34.917	1411.8032	60.41	.Q	.	.	.	.	V.	
35.000	1412.2070	58.64	.Q	.	.	.	.	V.	
35.083	1412.5990	56.92	.Q	.	.	.	.	V.	
35.167	1412.9795	55.25	.Q	.	.	.	.	V.	
35.250	1413.3489	53.63	.Q	.	.	.	.	V.	
35.333	1413.7074	52.06	.Q	.	.	.	.	V.	
35.417	1414.0554	50.53	.Q	.	.	.	.	V.	
35.500	1414.3933	49.05	.Q	.	.	.	.	V.	
35.583	1414.7212	47.62	.Q	.	.	.	.	V.	
35.667	1415.0396	46.22	.Q	.	.	.	.	V.	
35.750	1415.3485	44.86	.Q	.	.	.	.	V.	
35.833	1415.6484	43.55	.Q	.	.	.	.	V.	
35.917	1415.9396	42.27	Q	.	.	.	.	V.	
36.000	1416.2222	41.03	Q	.	.	.	.	V.	

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	2165.0
10%	1840.0
20%	1635.0
30%	990.0
40%	545.0
50%	105.0
60%	65.0
70%	50.0
80%	35.0
90%	20.0

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END OF FLOODSCx ROUTING ANALYSIS

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            F L O O D   R O U T I N G   A N A L Y S I S
         USING COUNTY HYDROLOGY MANUAL OF SAN BERNARDINO(1986)
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                        Analysis prepared by:

                            RBF Consulting
                         14257 Alton Parkway
                              Irvine, CA
                                92618

 ************************* DESCRIPTION OF STUDY *************************
* REDLANDS MASTER PLAN OF DRAINAGE UPDATE                               *
* PROPOSED UH ANALYSIS AT NODE 20353 WITH SMALLER OPAL BASIN            *
* NODE 20454 AMC II - BY TMULI  APRIL 2014                              *
 ************************************************************************

  FILE NAME: 353D.DAT
  TIME/DATE OF STUDY: 11:06 04/07/2014


**************************************************************************
  FLOW PROCESS FROM NODE    353.00 TO NODE    353.00 IS CODE =   1
--------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
==========================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =    4029.500 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.580 HOURS
         VALLEY(DEVELOPED):
                  "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.406
         FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.000
         MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.000
         VALLEY(UNDEVELOPED)/DESERT:
                  "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.594
         DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.000
         MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) =  0.580
         LOW LOSS FRACTION = 0.540
         *HYDROGRAPH MODEL #1 SPECIFIED*

         SPECIFIED PEAK  5-MINUTES RAINFALL(INCH)=  0.45
         SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)=  0.93
         SPECIFIED PEAK  1-HOUR RAINFALL(INCH) =  1.22
         SPECIFIED PEAK  3-HOUR RAINFALL(INCH) =  2.05
         SPECIFIED PEAK  6-HOUR RAINFALL(INCH) =  2.84
         SPECIFIED PEAK 24-HOUR RAINFALL(INCH) =  6.99

         *USER SPECIFIED PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
           5-MINUTE FACTOR = 0.800
          30-MINUTE FACTOR = 0.820
           1-HOUR FACTOR = 0.820
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           3-HOUR FACTOR = 0.973
           6-HOUR FACTOR = 0.987
          24-HOUR FACTOR = 0.992

         UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  14.368
```

UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	1.048	510.905
2	3.604	1245.266
3	7.893	2090.429
4	14.680	3307.073
5	23.504	4300.043
6	33.552	4896.684
7	44.502	5336.008
8	54.904	5069.075
9	63.371	4126.129
10	69.837	3151.007
11	74.809	2423.077
12	78.667	1880.098
13	81.579	1419.160
14	83.951	1155.937
15	85.883	941.323
16	87.386	732.586
17	88.696	638.091
18	89.625	452.741
19	90.486	419.874
20	91.263	378.356
21	91.984	351.390
22	92.623	311.589
23	93.231	296.145
24	93.841	297.521
25	94.309	227.943
26	94.706	193.441
27	95.102	193.087
28	95.449	168.768
29	95.765	154.053
30	96.081	154.053
31	96.392	151.733
32	96.656	128.555
33	96.907	122.298
34	97.158	122.376
35	97.409	122.298
36	97.642	113.721
37	97.813	83.341
38	97.979	80.824
39	98.145	80.664
40	98.311	80.824
41	98.476	80.664
42	98.642	80.828

43	98.796	74.998
44	98.871	36.830
45	98.933	29.907
46	98.994	29.825
47	99.055	29.907
48	99.117	29.825
49	99.178	29.825
50	99.239	29.907
51	99.300	29.825
52	99.362	29.829
53	99.423	29.825
54	99.484	29.829
55	99.545	29.825
56	99.606	29.829
57	99.668	29.829
58	99.729	29.825
59	99.790	29.829
60	99.851	29.825
61	99.912	29.829
62	99.974	29.825
63	100.000	12.834

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 1202.3899

TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1125.2114

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2 4 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

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HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 750.0 1500.0 2250.0 3000.0
0.083	0.0255	3.70	Q . . . .
0.167	0.1131	12.72	Q . . . .
0.250	0.3052	27.89	Q . . . .
0.333	0.6625	51.88	Q . . . .
0.417	1.2349	83.11	VQ . . . .
0.500	2.0525	118.72	VQ . . . .
0.583	3.1377	157.57	V Q . . . .
0.667	4.4777	194.57	V Q . . . .
0.750	6.0259	224.80	V Q . . . .
0.833	7.7341	248.03	V Q . . . .
0.917	9.5662	266.03	V Q . . . .
1.000	11.4955	280.13	V Q . . . .
1.083	13.4992	290.93	V Q . . . .
1.167	15.5642	299.84	V Q . . . .
1.250	17.6800	307.22	V Q . . . .
1.333	19.8364	313.10	V Q . . . .
1.417	22.0287	318.32	V Q . . . .
1.500	24.2477	322.20	V Q . . . .
1.583	26.4919	325.86	V Q . . . .
1.667	28.7593	329.22	.V Q . . . .
1.750	31.0486	332.40	.V Q . . . .
1.833	33.3578	335.31	.V Q . . . .
1.917	35.6864	338.11	.V Q . . . .
2.000	38.0344	340.92	.V Q . . . .
2.083	40.3983	343.25	.V Q . . . .
2.167	42.7766	345.33	.V Q . . . .
2.250	45.1693	347.42	.V Q . . . .
2.333	47.5751	349.33	.V Q . . . .
2.417	49.9936	351.15	.V Q . . . .
2.500	52.4246	352.98	.V Q . . . .
2.583	54.8681	354.80	.V Q . . . .
2.667	57.3230	356.46	. V Q . . . .
2.750	59.7891	358.08	. V Q . . . .
2.833	62.2664	359.70	. V Q . . . .
2.917	64.7550	361.34	. V Q . . . .
3.000	67.2544	362.92	. V Q . . . .
3.083	69.7633	364.29	. V Q . . . .
3.167	72.2815	365.65	. V Q . . . .
3.250	74.8092	367.01	. V Q . . . .
3.333	77.3463	368.38	. V Q . . . .
3.417	79.8928	369.76	. V Q . . . .
3.500	82.4490	371.15	. V Q . . . .
3.583	85.0144	372.51	. VQ . . . .
3.667	87.5874	373.59	. VQ . . . .
3.750	90.1675	374.63	. VQ . . . .
3.833	92.7549	375.68	. V Q . . . .
3.917	95.3495	376.74	. V Q . . . .

4.000	97.9515	377.81	.	V	Q	.	.	.	.
4.083	100.5609	378.88	.	V	Q	.	.	.	.
4.167	103.1777	379.96	.	V	Q	.	.	.	.
4.250	105.8021	381.05	.	V	Q	.	.	.	.
4.333	108.4339	382.15	.	V	Q	.	.	.	.
4.417	111.0735	383.26	.	V	Q	.	.	.	.
4.500	113.7206	384.37	.		VQ	.	.	.	.
4.583	116.3756	385.49	.		VQ	.	.	.	.
4.667	119.0383	386.63	.		VQ	.	.	.	.
4.750	121.7088	387.77	.		VQ	.	.	.	.
4.833	124.3873	388.92	.		VQ	.	.	.	.
4.917	127.0738	390.08	.		VQ	.	.	.	.
5.000	129.7683	391.24	.		VQ	.	.	.	.
5.083	132.4710	392.42	.		VQ	.	.	.	.
5.167	135.1818	393.61	.		VQ	.	.	.	.
5.250	137.9000	394.69	.		VQ	.	.	.	.
5.333	140.6251	395.68	.		VQ	.	.	.	.
5.417	143.3570	396.68	.		Q	.	.	.	.
5.500	146.0959	397.69	.		Q	.	.	.	.
5.583	148.8419	398.71	.		Q	.	.	.	.
5.667	151.5949	399.74	.		Q	.	.	.	.
5.750	154.3552	400.79	.		Q	.	.	.	.
5.833	157.1226	401.84	.		Q	.	.	.	.
5.917	159.8974	402.90	.		Q	.	.	.	.
6.000	162.6796	403.98	.		Q	.	.	.	.
6.083	165.4693	405.06	.		Q	.	.	.	.
6.167	168.2666	406.16	.		Q	.	.	.	.
6.250	171.0715	407.27	.		QV	.	.	.	.
6.333	173.8840	408.39	.		QV	.	.	.	.
6.417	176.7045	409.52	.		QV	.	.	.	.
6.500	179.5327	410.67	.		QV	.	.	.	.
6.583	182.3690	411.83	.		QV	.	.	.	.
6.667	185.2133	413.00	.		QV	.	.	.	.
6.750	188.0658	414.18	.		QV	.	.	.	.
6.833	190.9266	415.38	.		QV	.	.	.	.
6.917	193.7957	416.59	.		QV	.	.	.	.
7.000	196.6732	417.81	.		QV	.	.	.	.
7.083	199.5592	419.05	.		Q	V	.	.	.
7.167	202.4539	420.31	.		Q	V	.	.	.
7.250	205.3573	421.58	.		Q	V	.	.	.
7.333	208.2696	422.86	.		Q	V	.	.	.
7.417	211.1908	424.16	.		Q	V	.	.	.
7.500	214.1210	425.47	.		Q	V	.	.	.
7.583	217.0605	426.80	.		Q	V	.	.	.
7.667	220.0091	428.15	.		Q	V	.	.	.
7.750	222.9672	429.51	.		Q	V	.	.	.
7.833	225.9348	430.89	.		Q		V	.	.
7.917	228.9120	432.29	.		Q		V	.	.
8.000	231.8990	433.71	.		Q		V	.	.
8.083	234.8958	435.14	.		Q		V	.	.
8.167	237.9027	436.59	.		Q		V	.	.
8.250	240.9197	438.07	.		Q		V	.	.
8.333	243.9469	439.56	.		Q		V	.	.
8.417	246.9846	441.07	.		Q		V	.	.
8.500	250.0328	442.60	.		Q		V	.	.
8.583	253.0917	444.16	.		Q		V	.	.
8.667	256.1615	445.73	.		Q		V.	.	.
8.750	259.2423	447.33	.		Q		V.	.	.

8.833	262.3342	448.95	.		Q		V.	.	.
8.917	265.4374	450.59	.		Q		V.	.	.
9.000	268.5522	452.25	.		Q		V.	.	.
9.083	271.6785	453.95	.		Q		V.	.	.
9.167	274.8167	455.66	.		Q		V.	.	.
9.250	277.9668	457.40	.		Q		V.	.	.
9.333	281.1292	459.17	.		Q		V.	.	.
9.417	284.3038	460.97	.		Q		V	.	.
9.500	287.4911	462.79	.		Q		V	.	.
9.583	290.6911	464.64	.		Q		V	.	.
9.667	293.9040	466.52	.		Q		V	.	.
9.750	297.1301	468.43	.		Q		V	.	.
9.833	300.3696	470.37	.		Q		V	.	.
9.917	303.6227	472.35	.		Q		V	.	.
10.000	306.8896	474.35	.		Q		V	.	.
10.083	310.1705	476.39	.		Q		.V	.	.
10.167	313.4657	478.46	.		Q		.V	.	.
10.250	316.7755	480.58	.		Q		.V	.	.
10.333	320.1000	482.72	.		Q		.V	.	.
10.417	323.4396	484.91	.		Q		.V	.	.
10.500	326.7945	487.13	.		Q		.V	.	.
10.583	330.1650	489.40	.		Q		.V	.	.
10.667	333.5514	491.70	.		Q		.V	.	.
10.750	336.9539	494.05	.		Q		.V	.	.
10.833	340.3730	496.45	.		Q		. V	.	.
10.917	343.8089	498.89	.		Q		. V	.	.
11.000	347.2619	501.37	.		Q		. V	.	.
11.083	350.7324	503.91	.		Q		. V	.	.
11.167	354.2206	506.50	.		Q		. V	.	.
11.250	357.7271	509.14	.		Q		. V	.	.
11.333	361.2522	511.84	.		Q		. V	.	.
11.417	364.7962	514.59	.		Q		. V	.	.
11.500	368.3596	517.40	.		Q		. V	.	.
11.583	371.9428	520.28	.		Q		. V	.	.
11.667	375.5462	523.21	.		Q		. V	.	.
11.750	379.1703	526.22	.			Q	. V	.	.
11.833	382.8156	529.29	.			Q	. V	.	.
11.917	386.4825	532.44	.			Q	. V	.	.
12.000	390.1715	535.65	.			Q	. V	.	.
12.083	393.8730	537.46	.			Q	. V	.	.
12.167	397.5727	537.20	.			Q	. V	.	.
12.250	401.2543	534.56	.			Q	. V	.	.
12.333	404.8939	528.48	.			Q	. V	.	.
12.417	408.4725	519.61	.		Q		. V	.	.
12.500	411.9790	509.14	.		Q		. V	.	.
12.583	415.4057	497.55	.		Q		. V	.	.
12.667	418.7589	486.89	.		Q		. V	.	.
12.750	422.0590	479.17	.		Q		. V	.	.
12.833	425.3267	474.47	.		Q		. V	.	.
12.917	428.5780	472.09	.		Q		. V	.	.
13.000	431.8250	471.46	.		Q		. V	.	.
13.083	435.0784	472.38	.		Q		. V	.	.
13.167	438.3446	474.25	.		Q		. V	.	.
13.250	441.6295	476.96	.		Q		. V	.	.
13.333	444.9386	480.49	.		Q		. V	.	.
13.417	448.2755	484.52	.		Q		. V	.	.
13.500	451.6456	489.33	.		Q		. V	.	.
13.583	455.0512	494.50	.		Q		. V	.	.

13.667	458.4951	500.05	. Q . V . . .
13.750	461.9798	505.98	. Q . V . . .
13.833	465.5082	512.33	. Q . V . . .
13.917	469.0831	519.07	. Q . V . . .
14.000	472.7068	526.16	. Q . V . . .
14.083	476.3960	535.66	. Q . V . . .
14.167	480.1717	548.23	. Q . V . . .
14.250	484.0576	564.24	. Q . V . . .
14.333	488.0867	585.03	. Q . V . . .
14.417	492.2868	609.85	. Q . V . . .
14.500	496.6756	637.25	. Q . V . . .
14.583	501.2676	666.77	. Q . V . . .
14.667	506.0609	695.99	. Q. V . . .
14.750	511.0375	722.59	. Q. V . . .
14.833	516.1786	746.49	. Q. V . . .
14.917	521.4728	768.71	. Q V . . .
15.000	526.9136	790.00	. Q V . . .
15.083	532.4984	810.91	. Q V . . .
15.167	538.2294	832.15	. .Q V. . .
15.250	544.1121	854.17	. .Q V. . .
15.333	550.1531	877.16	. .Q V. . .
15.417	556.3331	897.33	. .Q V. . .
15.500	562.6187	912.67	. . Q V . .
15.583	568.9791	923.53	. . Q V . .
15.667	575.3658	927.35	. . Q V . .
15.750	581.7625	928.79	. . Q V . .
15.833	588.1931	933.74	. . Q V . .
15.917	594.7360	950.02	. . Q .V . .
16.000	601.6459	1003.33	. . Q .V . .
16.083	610.1028	1227.94	. . Q .V . .
16.167	620.6995	1538.64	. . Q V . .
16.250	633.7637	1896.93	. . . V Q . .
16.333	649.8599	2337.16	. . . V .Q .
16.417	668.3397	2683.27	. . . V . Q .
16.500	688.1893	2882.16	. . . V . Q .
16.583	708.6994	2978.07	. . . V . Q.
16.667	728.2141	2833.54	. . . V . Q .
16.750	745.3422	2486.99	. . . V . Q .
16.833	760.0594	2136.94	. . . VQ . .
16.917	772.9265	1868.30	. . . Q V . .
17.000	784.3654	1660.93	. . . Q V . .
17.083	794.5795	1483.10	. . Q. V . .
17.167	803.9396	1359.07	. . Q . V . .
17.250	812.5391	1248.65	. . Q . V . .
17.333	820.3956	1140.76	. . Q . V. .
17.417	827.7024	1060.94	. . Q . V. .
17.500	834.3340	962.92	. . Q . V. .
17.583	840.5834	907.40	. . Q . V. .
17.667	846.4615	853.50	. .Q . V .
17.750	852.0296	808.49	. Q . V .
17.833	857.2975	764.90	. Q . V .
17.917	862.3400	732.17	. Q. . V .
18.000	867.1955	705.02	. Q. . V .
18.083	871.7693	664.13	. Q . . V .
18.167	876.1624	637.87	. Q . . .V .
18.250	880.4669	625.02	. Q . . .V .
18.333	884.6804	611.79	. Q . . .V .
18.417	888.8514	605.64	. Q . . .V .

18.500	893.0282	606.46	. Q . . .V .
18.583	897.2175	608.28	. Q . . .V .
18.667	901.3831	604.85	. Q . . . V .
18.750	905.5431	604.04	. Q . . . V .
18.833	909.6951	602.86	. Q . . . V .
18.917	913.8244	599.58	. Q . . . V .
19.000	917.9033	592.26	. Q . . . V .
19.083	921.8927	579.26	. Q . . . V .
19.167	925.8447	573.82	. Q . . . V .
19.250	929.7632	568.97	. Q . . . V .
19.333	933.6459	563.77	. Q . . . V .
19.417	937.4898	558.13	. Q . . . V .
19.500	941.2889	551.63	. Q . . . V .
19.583	945.0256	542.57	. Q . . . V .
19.667	948.6481	525.98	. Q . . . V .
19.750	952.2195	518.57	. Q . . . V .
19.833	955.7568	513.61	. Q . . . V .
19.917	959.2625	509.04	. Q . . . V .
20.000	962.7363	504.40	. Q . . . V .
20.083	966.1789	499.86	. Q . . . V .
20.167	969.5911	495.45	. Q . . . V .
20.250	972.9738	491.17	. Q . . . V .
20.333	976.3278	486.99	. Q . . . V .
20.417	979.6535	482.89	. Q . . . V .
20.500	982.9518	478.92	. Q . . . V .
20.583	986.2247	475.21	. Q . . . V .
20.667	989.4738	471.77	. Q . . . V .
20.750	992.6998	468.41	. Q . . . V .
20.833	995.9029	465.09	. Q . . . V .
20.917	999.0831	461.76	. Q . . . V .
21.000	1002.2399	458.37	. Q . . . V .
21.083	1005.3718	454.74	. Q . . . V .
21.167	1008.4742	450.48	. Q . . . V .
21.250	1011.5172	441.83	. Q . . . V .
21.333	1014.5125	434.92	. Q . . . V .
21.417	1017.4867	431.86	. Q . . . V .
21.500	1020.4418	429.08	. Q . . . V .
21.583	1023.3777	426.30	. Q . . . V .
21.667	1026.2939	423.42	. Q . . . V .
21.750	1029.1908	420.63	. Q . . . V .
21.833	1032.0691	417.93	. Q . . . V .
21.917	1034.9293	415.31	. Q . . . V .
22.000	1037.7720	412.76	. Q . . . V .
22.083	1040.5977	410.29	. Q . . . V .
22.167	1043.4067	407.88	. Q . . . V .
22.250	1046.2001	405.59	. Q . . . V .
22.333	1048.9784	403.40	. Q . . . V .
22.417	1051.7419	401.27	. Q . . . V .
22.500	1054.4912	399.19	. Q . . . V .
22.583	1057.2266	397.17	. Q . . . V .
22.667	1059.9482	395.19	. Q . . . V .
22.750	1062.6566	393.25	. Q . . . V .
22.833	1065.3519	391.36	. Q . . . V .
22.917	1068.0344	389.50	. Q . . . V .
23.000	1070.7045	387.69	. Q . . . V .
23.083	1073.3623	385.92	. Q . . . V .
23.167	1076.0082	384.18	. Q . . . V .
23.250	1078.6420	382.43	. Q . . . V .

23.333	1081.2637	380.67	.	Q	.	.	.	V .
23.417	1083.8735	378.95	.	Q	.	.	.	V .
23.500	1086.4717	377.26	.	Q	.	.	.	V .
23.583	1089.0583	375.59	.	Q	.	.	.	V .
23.667	1091.6338	373.96	.	Q	.	.	.	V .
23.750	1094.1982	372.35	.	Q	.	.	.	V .
23.833	1096.7518	370.78	.	Q	.	.	.	V .
23.917	1099.2947	369.22	.	Q	.	.	.	V.
24.000	1101.8270	367.70	.	Q	.	.	.	V.
24.083	1104.3236	362.50	.	Q	.	.	.	V.
24.167	1106.7480	352.03	.	Q	.	.	.	V.
24.250	1109.0586	335.50	.	Q	.	.	.	V.
24.333	1111.1952	310.24	.	Q	.	.	.	V.
24.417	1113.1091	277.91	.	Q	.	.	.	V.
24.500	1114.7716	241.39	.	Q	.	.	.	V.
24.583	1116.1616	201.84	.	Q	.	.	.	V.
24.667	1117.2936	164.37	.	Q	.	.	.	V.
24.750	1118.2155	133.86	.	Q	.	.	.	V.
24.833	1118.9767	110.53	.	Q	.	.	.	V.
24.917	1119.6141	92.55	.	Q	.	.	.	V.
25.000	1120.1553	78.57	.	Q	.	.	.	V.
25.083	1120.6234	67.98	Q	.	.	.	.	V.
25.167	1121.0321	59.34	Q	.	.	.	.	V.
25.250	1121.3922	52.28	Q	.	.	.	.	V.
25.333	1121.7142	46.76	Q	.	.	.	.	V.
25.417	1122.0032	41.95	Q	.	.	.	.	V.
25.500	1122.2683	38.50	Q	.	.	.	.	V.
25.583	1122.5115	35.30	Q	.	.	.	.	V.
25.667	1122.7347	32.41	Q	.	.	.	.	V.
25.750	1122.9396	29.74	Q	.	.	.	.	V.
25.833	1123.1279	27.36	Q	.	.	.	.	V.
25.917	1123.3008	25.10	Q	.	.	.	.	V.
26.000	1123.4581	22.84	Q	.	.	.	.	V.
26.083	1123.6034	21.10	Q	.	.	.	.	V.
26.167	1123.7384	19.61	Q	.	.	.	.	V.
26.250	1123.8633	18.13	Q	.	.	.	.	V.
26.333	1123.9792	16.84	Q	.	.	.	.	V.
26.417	1124.0870	15.65	Q	.	.	.	.	V.
26.500	1124.1868	14.47	Q	.	.	.	.	V.
26.583	1124.2784	13.32	Q	.	.	.	.	V.
26.667	1124.3634	12.33	Q	.	.	.	.	V.
26.750	1124.4419	11.40	Q	.	.	.	.	V.
26.833	1124.5139	10.46	Q	.	.	.	.	V.
26.917	1124.5796	9.54	Q	.	.	.	.	V.
27.000	1124.6393	8.68	Q	.	.	.	.	V.
27.083	1124.6946	8.04	Q	.	.	.	.	V.
27.167	1124.7457	7.42	Q	.	.	.	.	V.
27.250	1124.7926	6.81	Q	.	.	.	.	V.
27.333	1124.8352	6.19	Q	.	.	.	.	V.
27.417	1124.8737	5.59	Q	.	.	.	.	V.
27.500	1124.9080	4.98	Q	.	.	.	.	V.
27.583	1124.9384	4.42	Q	.	.	.	.	V.
27.667	1124.9668	4.13	Q	.	.	.	.	V.
27.750	1124.9937	3.90	Q	.	.	.	.	V.
27.833	1125.0189	3.67	Q	.	.	.	.	V.
27.917	1125.0426	3.44	Q	.	.	.	.	V.
28.000	1125.0647	3.21	Q	.	.	.	.	V.
28.083	1125.0852	2.98	Q	.	.	.	.	V.

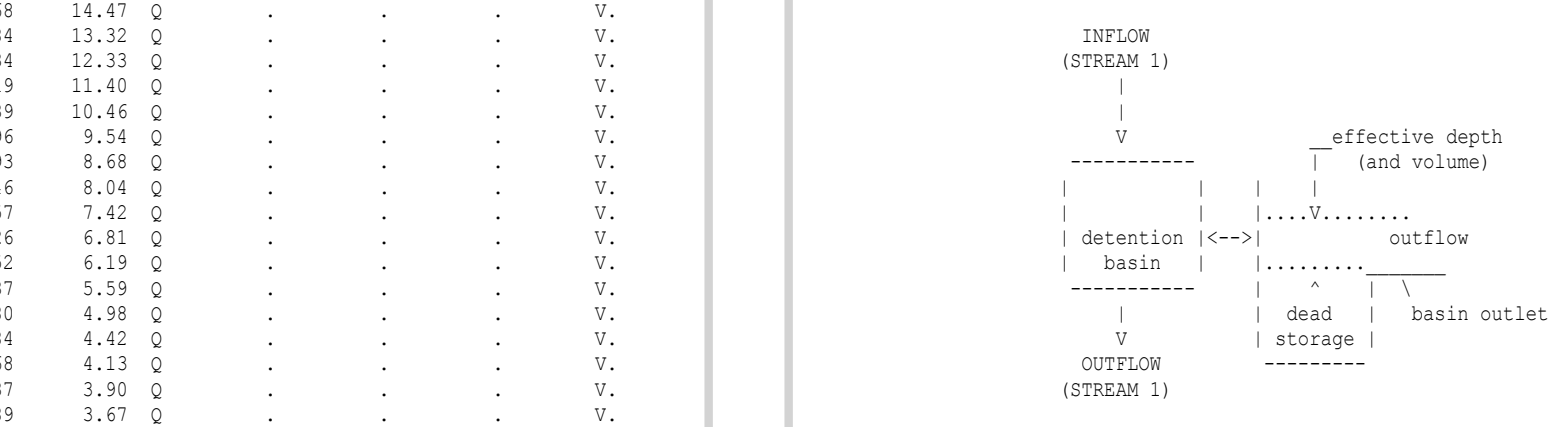
28.167	1125.1041	2.75	Q	.	.	.	.	V.
28.250	1125.1215	2.53	Q	.	.	.	.	V.
28.333	1125.1373	2.30	Q	.	.	.	.	V.
28.417	1125.1516	2.08	Q	.	.	.	.	V.
28.500	1125.1643	1.85	Q	.	.	.	.	V.
28.583	1125.1755	1.63	Q	.	.	.	.	V.
28.667	1125.1852	1.41	Q	.	.	.	.	V.
28.750	1125.1934	1.19	Q	.	.	.	.	V.
28.833	1125.2000	0.97	Q	.	.	.	.	V.
28.917	1125.2051	0.75	Q	.	.	.	.	V.
29.000	1125.2087	0.53	Q	.	.	.	.	V.
29.083	1125.2108	0.31	Q	.	.	.	.	V.
29.167	1125.2114	0.09	Q	.	.	.	.	V.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1750.0
10%	1395.0
20%	275.0
30%	135.0
40%	75.0
50%	55.0
60%	45.0
70%	35.0
80%	25.0
90%	20.0

FLOW PROCESS FROM NODE 353.00 TO NODE 353.00 IS CODE = 3.1

>>>>>FLOW-THROUGH DETENTION BASIN ROUTING MODEL APPLIED TO STREAM #1<<<<<



ROUTE RUNOFF HYDROGRAPH FROM STREAM NUMBER 1

THROUGH A FLOW-THROUGH DETENTION BASIN
SPECIFIED BASIN CONDITIONS ARE AS FOLLOWS:
DEAD STORAGE(AF) = 0.000
SPECIFIED DEAD STORAGE(AF) FILLED = 0.000
SPECIFIED EFFECTIVE VOLUME(AF) FILLED ABOVE OUTLET = 0.000
DETENTION BASIN CONSTANT LOSS RATE(CFS) = 0.00

BASIN DEPTH VERSUS OUTFLOW AND STORAGE INFORMATION:

INTERVAL NUMBER	DEPTH (FT)	OUTFLOW (CFS)	STORAGE (AF)
1	0.00	0.00	0.000
2	1.00	7.80	8.270
3	2.00	26.96	16.760
4	3.00	64.58	25.470
5	4.00	109.85	34.390
6	5.00	163.46	43.540
7	6.00	221.79	52.900
8	7.00	277.25	62.480
9	8.00	314.41	72.290
10	9.00	328.30	82.310
11	10.00	342.90	92.550
12	11.00	358.01	103.010
13	12.00	365.55	113.690
14	13.00	387.85	124.580
15	14.00	402.30	135.700
16	15.00	416.39	147.030
17	16.00	430.17	158.590
18	17.00	443.63	170.360
19	18.00	456.74	182.350
20	19.00	469.56	194.560
21	20.00	482.11	206.990
22	21.00	494.38	219.640
23	22.00	506.39	232.510
24	23.00	518.15	245.600
25	24.00	529.68	258.900
26	25.00	541.01	272.430
27	26.00	552.10	286.170
28	27.00	563.00	300.140
29	28.00	573.69	314.320
30	29.00	584.25	328.720
31	30.00	594.60	343.340
32	31.00	604.78	358.180
33	32.00	614.81	373.230
34	33.00	624.68	388.510
35	34.00	634.41	404.010
36	35.00	643.99	419.720
37	36.00	653.44	435.660
38	37.00	662.75	451.810
39	38.00	671.94	468.180
40	39.00	681.02	484.770

MODIFIED-PULS BASIN ROUTING MODEL RESULTS(5-MINUTE COMPUTATION INTERVALS):
(Note: Computed EFFECTIVE DEPTH and VOLUME are estimated at the clock time;
MEAN OUTFLOW is the average value during the unit interval.)

CLOCK TIME (HRS)	DEAD-STORAGE FILLED(AF)	INFLOW (CFS)	LOSS (CFS)	EFFECTIVE DEPTH(FT)	MEAN OUTFLOW (CFS)	EFFECTIVE VOLUME(AF)
15.083	0.000	810.91	0.00	16.67	437.7	166.435
15.167	0.000	832.15	0.00	16.90	440.7	169.131
15.250	0.000	854.17	0.00	17.13	443.8	171.957
15.333	0.000	877.16	0.00	17.38	447.0	174.919
15.417	0.000	897.33	0.00	17.64	450.3	177.998
15.500	0.000	912.67	0.00	17.90	453.7	181.159
15.583	0.000	923.53	0.00	18.17	457.1	184.371
15.667	0.000	927.35	0.00	18.43	460.5	187.586
15.750	0.000	928.79	0.00	18.69	463.9	190.787
15.833	0.000	933.74	0.00	18.95	467.3	194.000
15.917	0.000	950.02	0.00	19.22	470.6	197.301
16.000	0.000	1003.33	0.00	19.51	474.2	200.946
16.083	0.000	1227.94	0.00	19.93	478.6	206.106
16.167	0.000	1538.64	0.00	20.50	484.8	213.364
16.250	0.000	1896.93	0.00	21.26	492.9	223.034
16.333	0.000	2337.16	0.00	22.24	503.4	235.663
16.417	0.000	2683.27	0.00	23.38	515.8	250.590
16.500	0.000	2882.16	0.00	24.58	529.4	266.794
16.583	0.000	2978.07	0.00	25.81	543.1	283.563
16.667	0.000	2833.54	0.00	26.94	556.2	299.248
16.750	0.000	2486.99	0.00	27.87	567.3	312.469
16.833	0.000	2136.94	0.00	28.62	576.3	323.218
16.917	0.000	1868.30	0.00	29.23	583.4	332.067
17.000	0.000	1660.93	0.00	29.73	589.2	339.447
17.083	0.000	1483.10	0.00	30.15	594.0	345.571
17.167	0.000	1359.07	0.00	30.50	597.9	350.813
17.250	0.000	1248.65	0.00	30.80	601.3	355.271
17.333	0.000	1140.76	0.00	31.05	604.0	358.968
17.417	0.000	1060.94	0.00	31.26	606.3	362.099
17.500	0.000	962.92	0.00	31.42	608.2	364.542
17.583	0.000	907.40	0.00	31.56	609.7	366.592
17.667	0.000	853.50	0.00	31.67	610.9	368.262
17.750	0.000	808.49	0.00	31.76	612.0	369.616
17.833	0.000	764.90	0.00	31.83	612.8	370.664
17.917	0.000	732.17	0.00	31.88	613.4	371.482
18.000	0.000	705.02	0.00	31.93	613.9	372.110

PROCESS SUMMARY OF STORAGE:
INFLOW VOLUME = 1125.211 AF
BASIN STORAGE = 0.000 AF (WITH 0.000 AF INITIALLY FILLED)
OUTFLOW VOLUME = 1125.206 AF
LOSS VOLUME = 0.000 AF

FLOW PROCESS FROM NODE 353.00 TO NODE 353.00 IS CODE = 11

>>>>>VIEW STREAM NUMBER 1 HYDROGRAPH<<<<<

STREAM HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	175.0	350.0	525.0	700.0
0.083	0.0001	0.01	Q	.	.	.	.
0.167	0.0005	0.07	Q	.	.	.	.
0.250	0.0019	0.20	Q	.	.	.	.
0.333	0.0050	0.45	Q	.	.	.	.
0.417	0.0111	0.89	Q	.	.	.	.
0.500	0.0217	1.53	Q	.	.	.	.
0.583	0.0383	2.42	Q	.	.	.	.
0.667	0.0627	3.54	Q	.	.	.	.
0.750	0.0963	4.88	Q	.	.	.	.
0.833	0.1403	6.38	Q	.	.	.	.
0.917	0.2003	8.72	Q	.	.	.	.
1.000	0.2854	12.35	Q	.	.	.	.
1.083	0.3995	16.57	Q	.	.	.	.
1.167	0.5432	20.87	VQ	.	.	.	.
1.250	0.7184	25.43	VQ	.	.	.	.
1.333	0.9388	32.01	VQ	.	.	.	.
1.417	1.2166	40.33	V Q	.	.	.	.
1.500	1.5508	48.53	V Q	.	.	.	.
1.583	1.9407	56.61	V Q	.	.	.	.
1.667	2.3875	64.88	V Q	.	.	.	.
1.750	2.8950	73.68	V Q	.	.	.	.
1.833	3.4639	82.62	V Q	.	.	.	.
1.917	4.0930	91.34	V Q	.	.	.	.
2.000	4.7808	99.87	V Q	.	.	.	.
2.083	5.5272	108.38	V Q	.	.	.	.
2.167	6.3349	117.27	V Q	.	.	.	.
2.250	7.2049	126.33	V Q	.	.	.	.
2.333	8.1355	135.11	V Q	.	.	.	.
2.417	9.1246	143.62	V Q	.	.	.	.
2.500	10.1705	151.87	V Q	.	.	.	.
2.583	11.2715	159.87	V Q.	.	.	.	.
2.667	12.4276	167.86	V Q.	.	.	.	.
2.750	13.6385	175.82	V Q	.	.	.	.
2.833	14.9023	183.51	V Q	.	.	.	.
2.917	16.2174	190.95	V Q	.	.	.	.
3.000	17.5820	198.14	V .Q	.	.	.	.
3.083	18.9945	205.09	V .Q	.	.	.	.
3.167	20.4532	211.81	V . Q	.	.	.	.
3.250	21.9567	218.30	V . Q	.	.	.	.
3.333	23.5020	224.38	V . Q	.	.	.	.
3.417	25.0863	230.04	V . Q	.	.	.	.
3.500	26.7084	235.53	V . Q	.	.	.	.
3.583	28.3672	240.86	.V . Q	.	.	.	.
3.667	30.0616	246.03	.V . Q	.	.	.	.
3.750	31.7905	251.03	.V . Q	.	.	.	.
3.833	33.5528	255.89	.V . Q	.	.	.	.
3.917	35.3475	260.59	.V . Q	.	.	.	.
4.000	37.1736	265.15	.V . Q	.	.	.	.
4.083	39.0301	269.58	.V . Q	.	.	.	.
4.167	40.9163	273.87	.V . Q	.	.	.	.
4.250	42.8278	277.55	.V . Q	.	.	.	.
4.333	44.7593	280.45	.V . Q	.	.	.	.
4.417	46.7089	283.08	.V . Q	.	.	.	.
4.500	48.6764	285.68	.V . Q	.	.	.	.
4.583	50.6614	288.23	.V . Q	.	.	.	.
4.667	52.6638	290.75	.V . Q	.	.	.	.

4.750	54.6834	293.24	.V	.	Q	.	.
4.833	56.7198	295.68	. V	.	Q	.	.
4.917	58.7728	298.10	. V	.	Q	.	.
5.000	60.8422	300.48	. V	.	Q	.	.
5.083	62.9279	302.84	. V	.	Q	.	.
5.167	65.0295	305.16	. V	.	Q	.	.
5.250	67.1469	307.45	. V	.	Q	.	.
5.333	69.2799	309.71	. V	.	Q	.	.
5.417	71.4283	311.94	. V	.	Q	.	.
5.500	73.5899	313.88	. V	.	Q	.	.
5.583	75.7601	315.11	. V	.	Q	.	.
5.667	77.9358	315.91	. V	.	Q	.	.
5.750	80.1170	316.71	. V	.	Q	.	.
5.833	82.3037	317.51	. V	.	Q	.	.
5.917	84.4960	318.32	. V	.	Q	.	.
6.000	86.6938	319.13	. V	.	Q	.	.
6.083	88.8973	319.94	. V	.	Q	.	.
6.167	91.1063	320.75	. V	.	Q	.	.
6.250	93.3210	321.57	. V	.	Q	.	.
6.333	95.5413	322.39	. V	.	Q	.	.
6.417	97.7673	323.21	. V	.	Q	.	.
6.500	99.9989	324.04	. V	.	Q	.	.
6.583	102.2363	324.87	. V	.	Q	.	.
6.667	104.4794	325.70	. V	.	Q	.	.
6.750	106.7283	326.53	. V	.	Q	.	.
6.833	108.9829	327.37	. V	.	Q	.	.
6.917	111.2434	328.22	. V	.	Q	.	.
7.000	113.5098	329.08	. V	.	Q	.	.
7.083	115.7822	329.95	. V	.	Q	.	.
7.167	118.0606	330.83	. V	.	Q	.	.
7.250	120.3451	331.71	. V	.	Q	.	.
7.333	122.6357	332.60	. V	.	Q.	.	.
7.417	124.9325	333.48	. V	.	Q.	.	.
7.500	127.2353	334.38	. V	.	Q.	.	.
7.583	129.5444	335.27	. V	.	Q.	.	.
7.667	131.8596	336.17	. V	.	Q.	.	.
7.750	134.1811	337.08	. V	.	Q.	.	.
7.833	136.5089	337.99	. V	.	Q.	.	.
7.917	138.8429	338.90	. V	.	Q.	.	.
8.000	141.1833	339.82	. V	.	Q.	.	.
8.083	143.5301	340.75	. V	.	Q.	.	.
8.167	145.8832	341.68	. V	.	Q.	.	.
8.250	148.2428	342.61	. V	.	Q.	.	.
8.333	150.6089	343.56	. V	.	Q.	.	.
8.417	152.9816	344.52	. V	.	Q.	.	.
8.500	155.3610	345.48	. V	.	Q.	.	.
8.583	157.7470	346.45	. V	.	Q.	.	.
8.667	160.1398	347.43	. V	.	Q.	.	.
8.750	162.5393	348.41	. V	.	Q.	.	.
8.833	164.9456	349.39	. V	.	Q.	.	.
8.917	167.3587	350.39	. V	.	Q	.	.
9.000	169.7787	351.39	. V	.	Q	.	.
9.083	172.2057	352.40	. V	.	Q	.	.
9.167	174.6396	353.41	. V	.	Q	.	.
9.250	177.0806	354.43	. V	.	Q	.	.
9.333	179.5287	355.46	. V	.	Q	.	.
9.417	181.9839	356.49	. V	.	Q	.	.
9.500	184.4461	357.52	. V	.	Q	.	.

9.583	186.9137	358.29	.	V	.	Q	.	.	
9.667	189.3849	358.81	.	V	.	Q	.	.	
9.750	191.8597	359.34	.	V	.	Q	.	.	
9.833	194.3382	359.87	.	V	.	Q	.	.	
9.917	196.8203	360.42	.	V	.	Q	.	.	
10.000	199.3063	360.96	.	V	.	Q	.	.	
10.083	201.7961	361.52	.	V	.	Q	.	.	
10.167	204.2898	362.08	.	V	.	Q	.	.	
10.250	206.7874	362.65	.	V	.	Q	.	.	
10.333	209.2889	363.23	.	V	.	Q	.	.	
10.417	211.7945	363.81	.	V	.	Q	.	.	
10.500	214.3042	364.40	.	V	.	Q	.	.	
10.583	216.8180	365.01	.	V	.	Q	.	.	
10.667	219.3384	365.96	.	V	.	Q	.	.	
10.750	221.8695	367.51	.	V	.	.Q	.	.	
10.833	224.4129	369.30	.	V	.	.Q	.	.	
10.917	226.9687	371.10	.	V	.	.Q	.	.	
11.000	229.5369	372.91	.	V	.	.Q	.	.	
11.083	232.1176	374.72	.	V	.	.Q	.	.	
11.167	234.7110	376.55	.	V	.	.Q	.	.	
11.250	237.3169	378.39	.	V	.	.Q	.	.	
11.333	239.9357	380.24	.	V	.	.Q	.	.	
11.417	242.5672	382.10	.	V	.	.Q	.	.	
11.500	245.2117	383.98	.	V	.	.Q	.	.	
11.583	247.8692	385.87	.	V	.	. Q	.	.	
11.667	250.5386	387.61	.	V	.	. Q	.	.	
11.750	253.2178	389.02	.	V.		. Q	.	.	
11.833	255.9055	390.26	.	V.		. Q	.	.	
11.917	258.6019	391.51	.	V.		. Q	.	.	
12.000	261.3070	392.78	.	V.		. Q	.	.	
12.083	264.0209	394.06	.	V.		. Q	.	.	
12.167	266.7436	395.34	.	V.		. Q	.	.	
12.250	269.4749	396.59	.	V.		. Q	.	.	
12.333	272.2145	397.79	.	V.		. Q	.	.	
12.417	274.9618	398.91	.	V.		. Q	.	.	
12.500	277.7162	399.94	.	V.		. Q	.	.	
12.583	280.4770	400.86	.	V.		. Q	.	.	
12.667	283.2434	401.68	.	V		. Q	.	.	
12.750	286.0147	402.39	.	V		. Q	.	.	
12.833	288.7904	403.03	.	V		. Q	.	.	
12.917	291.5703	403.63	.	V		. Q	.	.	
13.000	294.3541	404.21	.	V		. Q	.	.	
13.083	297.1419	404.79	.	V		. Q	.	.	
13.167	299.9338	405.38	.	V		. Q	.	.	
13.250	302.7297	405.97	.	V		. Q	.	.	
13.333	305.5300	406.60	.	V		. Q	.	.	
13.417	308.3347	407.24	.	V		. Q	.	.	
13.500	311.1440	407.92	.	.V		. Q	.	.	
13.583	313.9583	408.64	.	.V		. Q	.	.	
13.667	316.7779	409.39	.	.V		. Q	.	.	
13.750	319.6029	410.19	.	.V		. Q	.	.	
13.833	322.4337	411.04	.	.V		. Q	.	.	
13.917	325.2707	411.93	.	.V		. Q	.	.	
14.000	328.1142	412.87	.	.V		. Q	.	.	
14.083	330.9646	413.88	.	.V		. Q	.	.	
14.167	333.8225	414.97	.	.V		. Q	.	.	
14.250	336.6887	416.17	.	.V		. Q	.	.	
14.333	339.5639	417.48	.	. V		. Q	.	.	

14.417	342.4492	418.95	.	. V	.	Q	.	.	
14.500	345.3461	420.63	.	. V	.	Q	.	.	
14.583	348.2560	422.52	.	. V	.	Q	.	.	
14.667	351.1805	424.63	.	. V	.	Q	.	.	
14.750	354.1210	426.96	.	. V	.	Q	.	.	
14.833	357.0787	429.46	.	. V	.	Q	.	.	
14.917	360.0545	432.08	.	. V	.	Q	.	.	
15.000	363.0490	434.80	.	. V	.	Q	.	.	
15.083	366.0632	437.67	.	. V	.	Q	.	.	
15.167	369.0982	440.68	.	. V	.	Q	.	.	
15.250	372.1547	443.80	.	. V	.	Q	.	.	
15.333	375.2332	447.00	.	. V	.	Q	.	.	
15.417	378.3344	450.30	.	. V	.	Q	.	.	
15.500	381.4592	453.71	.	. V	.	Q	.	.	
15.583	384.6076	457.15	.	. V	.	Q	.	.	
15.667	387.7794	460.55	.	. V	.	Q	.	.	
15.750	390.9745	463.92	.	. V	.	Q	.	.	
15.833	394.1927	467.29	.	. V	.	Q	.	.	
15.917	397.4341	470.65	.	. V	.	Q	.	.	
16.000	400.6997	474.17	.	. V	.	Q	.	.	
16.083	403.9959	478.61	.	. V	.	Q	.	.	
16.167	407.3345	484.76	.	. V	.	Q	.	.	
16.250	410.7292	492.92	.	. V	.	Q	.	.	
16.333	414.1961	503.39	.	. V	.	Q	.	.	
16.417	417.7487	515.85	.	. V	.	Q.		.	
16.500	421.3947	529.38	.	. V	.	Q		.	
16.583	425.1353	543.14	.	. V	.	.Q		.	
16.667	428.9655	556.15	.	. V	.	.Q		.	
16.750	432.8726	567.30	.	. V	.	. Q		.	
16.833	436.8412	576.25	.	. V	.	. Q		.	
16.917	440.8593	583.42	.	. V	.	. Q		.	
17.000	444.9174	589.23	.	. V	.	. Q		.	
17.083	449.0082	593.99	.	. V	.	. Q		.	
17.167	453.1261	597.93	.	. V	.	. Q		.	
17.250	457.2670	601.26	.	. V	.	. Q		.	
17.333	461.4271	604.04	.	. V	.	. Q		.	
17.417	465.6031	606.35	.	. V	.	. Q		.	
17.500	469.7918	608.21	.	. V	.	. Q		.	
17.583	473.9909	609.70	.	. V	.	. Q		.	
17.667	478.1985	610.94	.	. V	.	. Q		.	
17.750	482.4130	611.95	.	. V	.	. Q		.	
17.833	486.6330	612.75	.	. V	.	. Q		.	
17.917	490.8574	613.37	.	. V	.	. Q		.	
18.000	495.0850	613.85	.	. V	.	. Q		.	
18.083	499.3149	614.18	.	. V	.	. Q		.	
18.167	503.5459	614.35	.	. V	.	. Q		.	
18.250	507.7775	614.42	.	. V	.	. Q		.	
18.333	512.0092	614.44	.	. V	.	. Q		.	
18.417	516.2407	614.42	.	. V	.	. Q		.	
18.500	520.4720	614.38	.	. V	.	. Q		.	
18.583	524.7030	614.35	.	. V	.	. Q		.	
18.667	528.9338	614.31	.	. V	.	. Q		.	
18.750	533.1642	614.27	.	. V	.	. Q		.	
18.833	537.3944	614.22	.	. V.		. Q		.	
18.917	541.6241	614.16	.	. V.		. Q		.	
19.000	545.8533	614.07	.	. V.		. Q		.	
19.083	550.0815	613.94	.	. V.		. Q		.	
19.167	554.3086	613.77	.	. V.		. Q		.	

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19.250    558.5344    613.58  .         .        V.         .    Q    .
19.333    562.7586    613.36  .         .         V         .    Q    .
19.417    566.9812    613.12  .         .         V         .    Q    .
19.500    571.2020    612.86  .         .         V         .    Q    .
19.583    575.4207    612.55  .         .         V         .    Q    .
19.667    579.6369    612.20  .         .         V         .   Q     .
19.750    583.8503    611.78  .         .         V         .   Q     .
19.833    588.0607    611.35  .         .         V         .   Q     .
19.917    592.2679    610.89  .         .        .V         .   Q     .
20.000    596.4718    610.41  .         .        .V         .   Q     .
20.083    600.6723    609.91  .         .        .V         .   Q     .
20.167    604.8693    609.40  .         .        .V         .   Q     .
20.250    609.0626    608.87  .         .        .V         .   Q     .
20.333    613.2521    608.32  .         .        .V         .   Q     .
20.417    617.4377    607.76  .         .        .V         .   Q     .
20.500    621.6194    607.17  .         .        . V        .   Q     .
20.583    625.7969    606.58  .         .        . V        .   Q     .
20.667    629.9703    605.97  .         .        . V        .   Q     .
20.750    634.1393    605.35  .         .        . V        .   Q     .
20.833    638.3040    604.71  .         .        . V        .   Q     .
20.917    642.4641    604.04  .         .        . V        .   Q     .
21.000    646.6195    603.37  .         .        . V        .   Q     .
21.083    650.7701    602.67  .         .        .  V       .   Q     .
21.167    654.9159    601.97  .         .        .  V       .   Q     .
21.250    659.0566    601.23  .         .        .  V       .   Q     .
21.333    663.1921    600.46  .         .        .  V       .   Q     .
21.417    667.3221    599.68  .         .        .  V       .   Q     .
21.500    671.4466    598.88  .         .        .  V       .   Q     .
21.583    675.5656    598.07  .         .        .   V      .   Q     .
21.667    679.6789    597.26  .         .        .   V      .   Q     .
21.750    683.7866    596.43  .         .        .   V      .   Q     .
21.833    687.8884    595.60  .         .        .   V      .   Q     .
21.917    691.9845    594.75  .         .        .   V      .  Q      .
22.000    696.0746    593.88  .         .        .   V      .  Q      .
22.083    700.1586    592.99  .         .        .   V      .  Q      .
22.167    704.2364    592.10  .         .        .    V     .  Q      .
22.250    708.3080    591.19  .         .        .    V     .  Q      .
22.333    712.3733    590.29  .         .        .    V     .  Q      .
22.417    716.4323    589.37  .         .        .    V     .  Q      .
22.500    720.4850    588.45  .         .        .    V     .  Q      .
22.583    724.5314    587.53  .         .        .    V     .  Q      .
22.667    728.5713    586.60  .         .        .    V     .  Q      .
22.750    732.6048    585.66  .         .        .     V    .  Q      .
22.833    736.6318    584.72  .         .        .     V    .  Q      .
22.917    740.6522    583.76  .         .        .     V    .  Q      .
23.000    744.6658    582.78  .         .        .     V    .  Q      .
23.083    748.6726    581.79  .         .        .     V    .  Q      .
23.167    752.6726    580.80  .         .        .     V    .  Q      .
23.250    756.6657    579.80  .         .        .     V    .  Q      .
23.333    760.6520    578.80  .         .        .      V   .  Q      .
23.417    764.6313    577.80  .         .        .      V   .  Q      .
23.500    768.6038    576.79  .         .        .      V   . Q       .
23.583    772.5692    575.79  .         .        .      V   . Q       .
23.667    776.5277    574.77  .         .        .      V   . Q       .
23.750    780.4792    573.75  .         .        .      V   . Q       .
23.833    784.4235    572.71  .         .        .      V   . Q       .
23.917    788.3605    571.66  .         .        .       V  . Q       .
24.000    792.2903    570.61  .         .        .       V  . Q       .
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24.083    796.2128    569.55  .         .        .       V  . Q       .
24.167    800.1277    568.45  .         .        .       V  . Q       .
24.250    804.0347    567.28  .         .        .       V  . Q       .
24.333    807.9329    566.02  .         .        .       V  . Q       .
24.417    811.8214    564.61  .         .        .       V  . Q       .
24.500    815.6989    563.02  .         .        .       V  . Q       .
24.583    819.5638    561.20  .         .        .        V. Q       .
24.667    823.4149    559.17  .         .        .        V.Q        .
24.750    827.2509    556.98  .         .        .        V.Q        .
24.833    831.0707    554.65  .         .        .        V.Q        .
24.917    834.8738    552.20  .         .        .        V.Q        .
25.000    838.6592    549.64  .         .        .        V.Q        .
25.083    842.4264    547.00  .         .        .        V.Q        .
25.167    846.1751    544.32  .         .        .         VQ        .
25.250    849.9051    541.59  .         .        .         Q         .
25.333    853.6158    538.80  .         .        .         Q         .
25.417    857.3070    535.96  .         .        .         Q         .
25.500    860.9785    533.11  .         .        .         Q         .
25.583    864.6303    530.24  .         .        .         Q         .
25.667    868.2620    527.32  .         .        .         Q         .
25.750    871.8733    524.36  .         .        .        QV         .
25.833    875.4643    521.41  .         .        .        Q.V        .
25.917    879.0349    518.44  .         .        .        Q.V        .
26.000    882.5846    515.43  .         .        .        Q.V        .
26.083    886.1134    512.38  .         .        .        Q.V        .
26.167    889.6213    509.35  .         .        .        Q.V        .
26.250    893.1082    506.29  .         .        .       Q .V        .
26.333    896.5737    503.19  .         .        .       Q .V        .
26.417    900.0178    500.07  .         .        .       Q .V        .
26.500    903.4404    496.96  .         .        .       Q . V       .
26.583    906.8414    493.83  .         .        .       Q . V       .
26.667    910.2205    490.64  .         .        .       Q . V       .
26.750    913.5776    487.46  .         .        .      Q  . V       .
26.833    916.9128    484.28  .         .        .      Q  . V       .
26.917    920.2260    481.07  .         .        .      Q  . V       .
27.000    923.5168    477.82  .         .        .      Q  . V       .
27.083    926.7851    474.56  .         .        .      Q  . V       .
27.167    930.0311    471.33  .         .        .     Q   .  V      .
27.250    933.2546    468.05  .         .        .     Q   .  V      .
27.333    936.4553    464.73  .         .        .     Q   .  V      .
27.417    939.6331    461.42  .         .        .     Q   .  V      .
27.500    942.7883    458.13  .         .        .     Q   .  V      .
27.583    945.9205    454.79  .         .        .    Q    .  V      .
27.667    949.0294    451.41  .         .        .    Q    .  V      .
27.750    952.1151    448.06  .         .        .    Q    .  V      .
27.833    955.1779    444.71  .         .        .    Q    .  V      .
27.917    958.2172    441.31  .         .        .    Q    .   V     .
28.000    961.2328    437.88  .         .        .    Q    .   V     .
28.083    964.2250    434.46  .         .        .   Q     .   V     .
28.167    967.1938    431.06  .         .        .   Q     .   V     .
28.250    970.1388    427.61  .         .        .   Q     .   V     .
28.333    973.0599    424.14  .         .        .   Q     .   V     .
28.417    975.9572    420.69  .         .        .   Q     .   V     .
28.500    978.8307    417.25  .         .        .  Q      .   V     .
28.583    981.6803    413.76  .         .        .  Q      .   V     .
28.667    984.5057    410.24  .         .        .  Q      .   V     .
28.750    987.3070    406.75  .         .        .  Q      .    V    .
28.833    990.0844    403.28  .         .        .  Q      .    V    .
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28.917    992.8375    399.75  .         .         . Q       .    V    .
29.000    995.5662    396.20  .         .         . Q       .    V    .
29.083    998.2705    392.67  .         .         . Q       .    V    .
29.167   1000.9500    389.06  .         .         . Q       .    V    .
29.250   1003.5979    384.49  .         .         .Q        .    V    .
29.333   1006.2088    379.10  .         .         .Q        .    V    .
29.417   1008.7831    373.79  .         .         .Q        .    V    .
29.500   1011.3214    368.56  .         .         .Q        .    V    .
29.583   1013.8348    364.94  .         .         Q         .     V   .
29.667   1016.3350    363.03  .         .         Q         .     V   .
29.750   1018.8231    361.27  .         .         Q         .     V   .
29.833   1021.2991    359.52  .         .         Q         .     V   .
29.917   1023.7592    357.20  .         .         Q         .     V   .
30.000   1026.1973    354.00  .         .         Q         .     V   .
30.083   1028.6111    350.49  .         .         Q         .     V   .
30.167   1031.0011    347.02  .         .        Q.         .     V   .
30.250   1033.3674    343.60  .         .        Q.         .     V   .
30.333   1035.7106    340.22  .         .        Q.         .     V   .
30.417   1038.0308    336.90  .         .        Q.         .     V   .
30.500   1040.3284    333.61  .         .        Q.         .     V   .
30.583   1042.6035    330.35  .         .       Q .         .      V  .
30.667   1044.8567    327.16  .         .       Q .         .      V  .
30.750   1047.0884    324.04  .         .       Q .         .      V  .
30.833   1049.2988    320.96  .         .       Q .         .      V  .
30.917   1051.4883    317.91  .         .       Q .         .      V  .
31.000   1053.6510    314.02  .         .      Q  .         .      V  .
31.083   1055.7697    307.63  .         .      Q  .         .      V  .
31.167   1057.8337    299.71  .         .      Q  .         .      V  .
31.250   1059.8447    291.99  .         .     Q   .         .      V  .
31.333   1061.8040    284.47  .         .     Q   .         .      V  .
31.417   1063.7061    276.18  .         .    Q    .         .      V  .
31.500   1065.5400    266.30  .         .    Q    .         .      V  .
31.583   1067.3024    255.89  .         .   Q     .         .      V  .
31.667   1068.9957    245.88  .         .   Q     .         .       V .
31.750   1070.6229    236.27  .         .  Q      .         .       V .
31.833   1072.1865    227.04  .         . Q       .         .       V .
31.917   1073.6870    217.86  .         . Q       .         .       V .
32.000   1075.1246    208.74  .         .Q        .         .       V .
32.083   1076.5018    199.96  .         .Q        .         .       V .
32.167   1077.8212    191.56  .         Q         .         .       V .
32.250   1079.0851    183.51  .         Q         .         .       V .
32.333   1080.2959    175.80  .         Q         .         .       V .
32.417   1081.4558    168.42  .        Q.         .         .       V .
32.500   1082.5681    161.50  .        Q.         .         .       V .
32.583   1083.6361    155.08  .       Q .         .         .       V .
32.667   1084.6619    148.94  .       Q .         .         .       V .
32.750   1085.6471    143.05  .       Q .         .         .       V .
32.833   1086.5934    137.39  .      Q  .         .         .       V .
32.917   1087.5022    131.96  .      Q  .         .         .       V .
33.000   1088.3750    126.74  .      Q  .         .         .       V .
33.083   1089.2134    121.73  .     Q   .         .         .       V .
33.167   1090.0186    116.91  .     Q   .         .         .       V .
33.250   1090.7919    112.29  .     Q   .         .         .       V .
33.333   1091.5365    108.12  .     Q   .         .         .       V .
33.417   1092.2555    104.40  .    Q    .         .         .       V .
33.500   1092.9498    100.81  .    Q    .         .         .       V .
33.583   1093.6202     97.35  .    Q    .         .         .       V .
33.667   1094.2676     94.00  .    Q    .         .         .       V .
```



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33.750   1094.8927     90.77  .    Q    .         .         .       V .
33.833   1095.4963     87.65  .    Q    .         .         .       V .
33.917   1096.0792     84.64  .   Q     .         .         .       V .
34.000   1096.6421     81.74  .   Q     .         .         .       V .
34.083   1097.1857     78.93  .   Q     .         .         .        V.
34.167   1097.7106     76.22  .   Q     .         .         .        V.
34.250   1098.2174     73.60  .   Q     .         .         .        V.
34.333   1098.7069     71.07  .   Q     .         .         .        V.
34.417   1099.1796     68.63  .  Q      .         .         .        V.
34.500   1099.6360     66.27  .  Q      .         .         .        V.
34.583   1100.0776     64.12  .  Q      .         .         .        V.
34.667   1100.5060     62.20  .  Q      .         .         .        V.
34.750   1100.9218     60.38  .  Q      .         .         .        V.
34.833   1101.3254     58.61  .  Q      .         .         .        V.
34.917   1101.7173     56.89  .  Q      .         .         .        V.
35.000   1102.0977     55.22  .  Q      .         .         .        V.
35.083   1102.4668     53.60  .  Q      .         .         .        V.
35.167   1102.8252     52.03  . Q       .         .         .        V.
35.250   1103.1731     50.51  . Q       .         .         .        V.
35.333   1103.5107     49.03  . Q       .         .         .        V.
35.417   1103.8385     47.59  . Q       .         .         .        V.
35.500   1104.1566     46.20  . Q       .         .         .        V.
35.583   1104.4655     44.84  . Q       .         .         .        V.
35.667   1104.7653     43.53  . Q       .         .         .        V.
35.750   1105.0563     42.25  . Q       .         .         .        V.
35.833   1105.3387     41.01  . Q       .         .         .        V.
35.917   1105.6129     39.81  . Q       .         .         .        V.
36.000   1105.8790     38.64  . Q       .         .         .        V.
```

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	2165.0
10%	1985.0
20%	1850.0
30%	1760.0
40%	1685.0
50%	1555.0
60%	1120.0
70%	800.0
80%	625.0
90%	495.0

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END OF FLOODSCx ROUTING ANALYSIS

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

            F L O O D    R O U T I N G    A N A L Y S I S
         USING COUNTY HYDROLOGY MANUAL OF SAN BERNARDINO(1986)
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                        Analysis prepared by:

                            RBF Consulting
                          14257 Alton Parkway
                               Irvine, CA
                                 92618

 ************************* DESCRIPTION OF STUDY *************************
* REDLANDS MASTER PLAN OF DRAINAGE                                      *
* NODE 20454 - REGIONAL                                                 *
* BY TMULI   JN: 136769  FEBRUARY 2014                                  *
 ************************************************************************

  FILE NAME: 20454.DAT
  TIME/DATE OF STUDY: 10:26 02/27/2014


**************************************************************************
  FLOW PROCESS FROM NODE  20120.00 TO NODE  20454.00 IS CODE =   1
--------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
==========================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =    5454.890 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.620 HOURS
         VALLEY(DEVELOPED):
                  "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.502
         FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.000
         MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.000
         VALLEY(UNDEVELOPED)/DESERT:
                  "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.498
         DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.000
         MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) =  0.560
         LOW LOSS FRACTION = 0.530
         *HYDROGRAPH MODEL #1 SPECIFIED*

         SPECIFIED PEAK  5-MINUTES RAINFALL(INCH)=  0.46
         SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)=  0.95
         SPECIFIED PEAK  1-HOUR RAINFALL(INCH) =  1.25
         SPECIFIED PEAK  3-HOUR RAINFALL(INCH) =  2.03
         SPECIFIED PEAK  6-HOUR RAINFALL(INCH) =  2.75
         SPECIFIED PEAK 24-HOUR RAINFALL(INCH) =  5.50

         *USER SPECIFIED PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
           5-MINUTE FACTOR = 0.770
          30-MINUTE FACTOR = 0.770
           1-HOUR FACTOR = 0.770
```



```
           3-HOUR FACTOR = 0.960
           6-HOUR FACTOR = 0.980
          24-HOUR FACTOR = 0.990

         UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  13.441
```

UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.945	623.179
2	3.167	1466.014
3	6.794	2392.919
4	12.709	3901.995
5	20.597	5203.620
6	29.516	5883.744
7	39.550	6619.807
8	50.252	7059.992
9	59.264	5945.557
10	66.848	5002.733
11	72.700	3860.417
12	77.287	3026.313
13	80.811	2324.782
14	83.482	1761.777
15	85.704	1466.203
16	87.487	1176.149
17	88.858	904.673
18	90.070	799.606
19	90.867	525.286
20	91.610	490.140
21	92.271	436.552
22	92.887	406.137
23	93.467	382.608
24	93.982	339.715
25	94.502	343.103
26	95.003	330.444
27	95.325	212.725
28	95.637	205.376
29	95.945	203.756
30	96.210	174.342
31	96.458	163.511
32	96.706	163.556
33	96.952	162.363
34	97.162	139.015
35	97.359	129.854
36	97.556	129.945
37	97.753	129.759
38	97.948	128.989
39	98.100	99.777
40	98.229	85.649
41	98.360	85.835
42	98.489	85.644

43	98.620	85.835
44	98.749	85.649
45	98.879	85.835
46	98.997	77.626
47	99.054	37.522
48	99.102	31.699
49	99.150	31.699
50	99.198	31.699
51	99.246	31.603
52	99.294	31.799
53	99.342	31.603
54	99.390	31.794
55	99.438	31.603
56	99.486	31.794
57	99.534	31.603
58	99.582	31.603
59	99.630	31.608
60	99.678	31.603
61	99.726	31.603
62	99.774	31.608
63	99.822	31.603
64	99.870	31.603
65	99.918	31.603
66	99.966	31.608
67	100.000	22.719

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 1241.2659
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1233.2531

==========

2 4 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

==========

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	975.0	1950.0	2925.0	3900.0
0.083	0.0194	2.81	Q	.	.	.	.
0.167	0.0843	9.43	Q	.	.	.	.
0.250	0.2238	20.25	Q	.	.	.	.
0.333	0.4848	37.90	Q	.	.	.	.
0.417	0.9081	61.47	Q	.	.	.	.
0.500	1.5153	88.16	Q	.	.	.	.
0.583	2.3297	118.25	VQ	.	.	.	.
0.667	3.3655	150.40	VQ	.	.	.	.
0.750	4.5886	177.60	VQ	.	.	.	.
0.833	5.9704	200.63	V Q	.	.	.	.
0.917	7.4756	218.56	V Q	.	.	.	.
1.000	9.0788	232.79	V Q	.	.	.	.
1.083	10.7585	243.89	V Q	.	.	.	.
1.167	12.4973	252.48	V Q	.	.	.	.
1.250	14.2863	259.76	V Q	.	.	.	.
1.333	16.1167	265.76	V Q	.	.	.	.
1.417	17.9800	270.56	V Q	.	.	.	.
1.500	19.8732	274.90	V Q	.	.	.	.
1.583	21.7879	278.01	V Q	.	.	.	.
1.667	23.7230	280.98	V Q	.	.	.	.
1.750	25.6770	283.72	V Q	.	.	.	.
1.833	27.6490	286.34	V Q	.	.	.	.
1.917	29.6384	288.85	V Q	.	.	.	.
2.000	31.6439	291.19	.VQ	.	.	.	.
2.083	33.6656	293.56	.V Q	.	.	.	.
2.167	35.7033	295.88	.V Q	.	.	.	.
2.250	37.7534	297.67	.V Q	.	.	.	.
2.333	39.8157	299.45	.V Q	.	.	.	.
2.417	41.8902	301.22	.V Q	.	.	.	.
2.500	43.9762	302.88	.V Q	.	.	.	.
2.583	46.0732	304.49	.V Q	.	.	.	.
2.667	48.1814	306.12	.V Q	.	.	.	.
2.750	50.3009	307.74	.V Q	.	.	.	.
2.833	52.4309	309.28	.V Q	.	.	.	.
2.917	54.5712	310.78	.V Q	.	.	.	.
3.000	56.7220	312.29	.V Q	.	.	.	.
3.083	58.8832	313.81	.V Q	.	.	.	.
3.167	61.0549	315.34	.V Q	.	.	.	.
3.250	63.2364	316.74	. VQ	.	.	.	.
3.333	65.4271	318.10	. VQ	.	.	.	.
3.417	67.6272	319.46	. VQ	.	.	.	.
3.500	69.8368	320.83	. VQ	.	.	.	.
3.583	72.0558	322.21	. VQ	.	.	.	.
3.667	74.2845	323.61	. VQ	.	.	.	.
3.750	76.5229	325.01	. VQ	.	.	.	.
3.833	78.7707	326.39	. VQ	.	.	.	.
3.917	81.0269	327.59	. VQ	.	.	.	.

4.000	83.2913	328.79	. VQ	.	.	.	.	.
4.083	85.5639	329.99	. VQ	.	.	.	.	.
4.167	87.8449	331.20	. VQ	.	.	.	.	.
4.250	90.1344	332.43	. VQ	.	.	.	.	.
4.333	92.4323	333.67	. VQ	.	.	.	.	.
4.417	94.7389	334.91	. Q	.	.	.	.	.
4.500	97.0541	336.17	. Q	.	.	.	.	.
4.583	99.3781	337.44	. Q	.	.	.	.	.
4.667	101.7109	338.73	. Q	.	.	.	.	.
4.750	104.0526	340.02	. Q	.	.	.	.	.
4.833	106.4033	341.33	. Q	.	.	.	.	.
4.917	108.7631	342.64	. Q	.	.	.	.	.
5.000	111.1321	343.98	. Q	.	.	.	.	.
5.083	113.5103	345.32	. Q	.	.	.	.	.
5.167	115.8979	346.68	. Q	.	.	.	.	.
5.250	118.2950	348.05	. Q	.	.	.	.	.
5.333	120.7016	349.44	. Q	.	.	.	.	.
5.417	123.1178	350.83	. Q	.	.	.	.	.
5.500	125.5437	352.25	. QV	.	.	.	.	.
5.583	127.9792	353.63	. QV	.	.	.	.	.
5.667	130.4237	354.94	. QV	.	.	.	.	.
5.750	132.8772	356.25	. QV	.	.	.	.	.
5.833	135.3399	357.58	. QV	.	.	.	.	.
5.917	137.8118	358.92	. QV	.	.	.	.	.
6.000	140.2931	360.28	. QV	.	.	.	.	.
6.083	142.7838	361.66	. QV	.	.	.	.	.
6.167	145.2841	363.05	. QV	.	.	.	.	.
6.250	147.7942	364.46	. QV	.	.	.	.	.
6.333	150.3140	365.88	. QV	.	.	.	.	.
6.417	152.8438	367.32	. QV	.	.	.	.	.
6.500	155.3837	368.79	. Q V	.	.	.	.	.
6.583	157.9337	370.26	. Q V	.	.	.	.	.
6.667	160.4940	371.76	. Q V	.	.	.	.	.
6.750	163.0647	373.27	. Q V	.	.	.	.	.
6.833	165.6460	374.80	. Q V	.	.	.	.	.
6.917	168.2380	376.35	. Q V	.	.	.	.	.
7.000	170.8408	377.93	. Q V	.	.	.	.	.
7.083	173.4545	379.51	. Q V	.	.	.	.	.
7.167	176.0794	381.13	. Q V	.	.	.	.	.
7.250	178.7154	382.76	. Q V	.	.	.	.	.
7.333	181.3629	384.42	. Q V	.	.	.	.	.
7.417	184.0220	386.09	. Q V	.	.	.	.	.
7.500	186.6927	387.79	. Q V	.	.	.	.	.
7.583	189.3753	389.51	. Q V	.	.	.	.	.
7.667	192.0699	391.26	. Q V	.	.	.	.	.
7.750	194.7767	393.03	. Q V	.	.	.	.	.
7.833	197.4959	394.82	. Q V	.	.	.	.	.
7.917	200.2276	396.64	. Q V	.	.	.	.	.
8.000	202.9720	398.49	. Q V	.	.	.	.	.
8.083	205.7293	400.36	. Q V	.	.	.	.	.
8.167	208.4996	402.26	. Q V	.	.	.	.	.
8.250	211.2833	404.18	. Q V	.	.	.	.	.
8.333	214.0804	406.14	. Q V	.	.	.	.	.
8.417	216.8911	408.12	. Q V	.	.	.	.	.
8.500	219.7157	410.14	. Q V	.	.	.	.	.
8.583	222.5544	412.18	. Q V	.	.	.	.	.
8.667	225.4074	414.26	. Q V	.	.	.	.	.
8.750	228.2749	416.36	. Q V	.	.	.	.	.

8.833	231.1571	418.50	. Q V	.	.	.	.	.
8.917	234.0543	420.67	. Q V	.	.	.	.	.
9.000	236.9667	422.89	. Q V	.	.	.	.	.
9.083	239.8946	425.12	. Q V	.	.	.	.	.
9.167	242.8382	427.41	. Q V	.	.	.	.	.
9.250	245.7977	429.72	. Q V	.	.	.	.	.
9.333	248.7735	432.09	. Q V	.	.	.	.	.
9.417	251.7658	434.48	. Q V	.	.	.	.	.
9.500	254.7749	436.92	. Q V	.	.	.	.	.
9.583	257.8011	439.40	. Q V	.	.	.	.	.
9.667	260.8447	441.93	. Q V	.	.	.	.	.
9.750	263.9059	444.49	. Q V	.	.	.	.	.
9.833	266.9852	447.11	. Q V	.	.	.	.	.
9.917	270.0828	449.77	. Q V	.	.	.	.	.
10.000	273.1991	452.49	. Q V	.	.	.	.	.
10.083	276.3344	455.24	. Q V	.	.	.	.	.
10.167	279.4891	458.06	. Q V.	.	.	.	.	.
10.250	282.6635	460.92	. Q V.	.	.	.	.	.
10.333	285.8581	463.85	. Q V.	.	.	.	.	.
10.417	289.0732	466.83	. Q V.	.	.	.	.	.
10.500	292.3092	469.87	. Q V.	.	.	.	.	.
10.583	295.5665	472.97	. Q V.	.	.	.	.	.
10.667	298.8457	476.14	. Q V.	.	.	.	.	.
10.750	302.1471	479.36	. Q V.	.	.	.	.	.
10.833	305.4712	482.66	. Q V.	.	.	.	.	.
10.917	308.8185	486.02	. Q V	.	.	.	.	.
11.000	312.1895	489.47	. Q V	.	.	.	.	.
11.083	315.5846	492.98	. Q V	.	.	.	.	.
11.167	319.0046	496.58	. Q V	.	.	.	.	.
11.250	322.4498	500.25	. Q V	.	.	.	.	.
11.333	325.9210	504.01	. Q V	.	.	.	.	.
11.417	329.4186	507.85	. Q V	.	.	.	.	.
11.500	332.9434	511.80	. Q V	.	.	.	.	.
11.583	336.4958	515.82	. Q V	.	.	.	.	.
11.667	340.0768	519.96	. Q .V	.	.	.	.	.
11.750	343.6870	524.19	. Q .V	.	.	.	.	.
11.833	347.3270	528.54	. Q .V	.	.	.	.	.
11.917	350.9977	532.98	. Q .V	.	.	.	.	.
12.000	354.6999	537.56	. Q .V	.	.	.	.	.
12.083	358.4314	541.81	. Q .V	.	.	.	.	.
12.167	362.1891	545.62	. Q .V	.	.	.	.	.
12.250	365.9693	548.89	. Q .V	.	.	.	.	.
12.333	369.7660	551.28	. Q .V	.	.	.	.	.
12.417	373.5737	552.88	. Q . V	.	.	.	.	.
12.500	377.3904	554.18	. Q . V	.	.	.	.	.
12.583	381.2135	555.11	. Q . V	.	.	.	.	.
12.667	385.0421	555.92	. Q . V	.	.	.	.	.
12.750	388.8828	557.67	. Q . V	.	.	.	.	.
12.833	392.7416	560.29	. Q . V	.	.	.	.	.
12.917	396.6250	563.88	. Q . V	.	.	.	.	.
13.000	400.5389	568.29	. Q . V	.	.	.	.	.
13.083	404.4879	573.39	. Q . V	.	.	.	.	.
13.167	408.4765	579.16	. Q . V	.	.	.	.	.
13.250	412.5079	585.35	. Q . V	.	.	.	.	.
13.333	416.5854	592.06	. Q . V	.	.	.	.	.
13.417	420.7122	599.21	. Q . V	.	.	.	.	.
13.500	424.8911	606.78	. Q . V	.	.	.	.	.
13.583	429.1255	614.83	. Q . V	.	.	.	.	.

13.667	433.4182	623.31	. Q . V . . .
13.750	437.7720	632.17	. Q . V . . .
13.833	442.1900	641.50	. Q . V . . .
13.917	446.6752	651.24	. Q . V . . .
14.000	451.2313	661.54	. Q . V . . .
14.083	455.8806	675.08	. Q . V . . .
14.167	460.6530	692.95	. Q . V . . .
14.250	465.5810	715.55	. Q . V . . .
14.333	470.7153	745.50	. Q . V . . .
14.417	476.0996	781.80	. Q . V . . .
14.500	481.7598	821.86	. Q . V . . .
14.583	487.7228	865.83	. Q . V . . .
14.667	494.0077	912.57	. Q. V . . .
14.750	500.5857	955.12	. Q. V . . .
14.833	507.4349	994.51	. Q V . . .
14.917	514.5274	1029.83	. Q V . . .
15.000	521.8465	1062.73	. Q V . . .
15.083	529.3799	1093.85	. .Q V . . .
15.167	537.1219	1124.14	. .Q V . . .
15.250	545.0760	1154.93	. .Q V . . .
15.333	553.2489	1186.70	. . Q V . . .
15.417	561.6097	1213.99	. . Q V . . .
15.500	570.1234	1236.20	. . Q V . . .
15.583	578.7493	1252.48	. . Q V . . .
15.667	587.4254	1259.76	. . Q V. . . .
15.750	596.1172	1262.05	. . Q V. . . .
15.833	604.8512	1268.17	. . Q V. . . .
15.917	613.6977	1284.51	. . Q V. . . .
16.000	622.8917	1334.97	. . Q V . . .
16.083	633.8334	1588.74	. . Q V . . .
16.167	647.1237	1929.75	. . QV . . .
16.250	663.1143	2321.83	. . .V Q . . .
16.333	682.7992	2858.25	. . . V Q. . .
16.417	705.5634	3305.36	. . . V . Q .
16.500	730.0760	3559.22	. . . V . Q .
16.583	756.0754	3775.12	. . . V . Q .
16.667	782.4940	3835.98	. . . V . Q.
16.750	806.2877	3454.84	. . . V . Q .
16.833	827.6144	3096.65	. . . V .Q .
16.917	846.1970	2698.18	. . . Q . .
17.000	862.6980	2395.95	. . . Q V . .
17.083	877.3868	2132.81	. . .Q V . .
17.167	890.5747	1914.89	. . Q. V . .
17.250	902.7358	1765.79	. . Q . V. .
17.333	913.8642	1615.84	. . Q . V. .
17.417	923.9915	1470.47	. . Q . V. .
17.500	933.3965	1365.61	. . Q . V .
17.583	941.8282	1224.28	. . Q . V .
17.667	949.7381	1148.52	. .Q . V .
17.750	957.1534	1076.71	. .Q . .V .
17.833	964.1676	1018.45	. Q . .V .
17.917	970.8271	966.97	. Q. . .V .
18.000	977.1445	917.28	. Q. . .V .
18.083	983.2308	883.74	. Q. . .V .
18.167	989.0699	847.83	. Q . . . V .
18.250	994.5125	790.27	. Q . . . V .
18.333	999.7900	766.29	. Q . . . V .
18.417	1004.9377	747.45	. Q . . . V .

18.500	1009.9240	724.00	. Q . . . V .
18.583	1014.8000	708.01	. Q . . . V .
18.667	1019.5967	696.47	. Q . . . V .
18.750	1024.3094	684.29	. Q . . . V .
18.833	1028.9001	666.57	. Q . . . V .
18.917	1033.3964	652.85	. Q . . . V .
19.000	1037.8176	641.97	. Q . . . V .
19.083	1042.1621	630.81	. Q . . . V .
19.167	1046.4225	618.61	. Q . . . V .
19.250	1050.5566	600.28	. Q . . . V .
19.333	1054.5988	586.91	. Q . . . V .
19.417	1058.5789	577.91	. Q . . . V .
19.500	1062.5004	569.40	. Q . . . V .
19.583	1066.3627	560.80	. Q . . . V .
19.667	1070.1643	552.00	. Q . . . V .
19.750	1073.9032	542.88	. Q . . . V .
19.833	1077.5596	530.91	. Q . . . V .
19.917	1081.0840	511.74	. Q . . . V .
20.000	1084.5449	502.53	. Q . . . V .
20.083	1087.9583	495.62	. Q . . . V .
20.167	1091.3267	489.10	. Q . . . V .
20.250	1094.6501	482.58	. Q . . . V .
20.333	1097.9312	476.40	. Q . . . V .
20.417	1101.1707	470.37	. Q . . . V .
20.500	1104.3706	464.63	. Q . . . V .
20.583	1107.5316	458.97	. Q . . . V .
20.667	1110.6554	453.58	. Q . . . V .
20.750	1113.7424	448.24	. Q . . . V .
20.833	1116.7942	443.11	. Q . . . V .
20.917	1119.8132	438.36	. Q . . . V .
21.000	1122.8019	433.95	. Q . . . V .
21.083	1125.7609	429.64	. Q . . . V .
21.167	1128.6906	425.39	. Q . . . V .
21.250	1131.5912	421.17	. Q . . . V .
21.333	1134.4625	416.91	. Q . . . V .
21.417	1137.3041	412.59	. Q . . . V .
21.500	1140.1129	407.85	. Q . . . V .
21.583	1142.8706	400.42	. Q . . . V .
21.667	1145.5571	390.08	. Q . . . V .
21.750	1148.2168	386.19	. Q . . . V .
21.833	1150.8522	382.65	. Q . . . V .
21.917	1153.4637	379.21	. Q . . . V .
22.000	1156.0511	375.70	. Q . . . V .
22.083	1158.6152	372.31	. Q . . . V .
22.167	1161.1567	369.04	. Q . . . V .
22.250	1163.6764	365.86	. Q . . . V .
22.333	1166.1748	362.77	. Q . . . V .
22.417	1168.6526	359.77	. Q . . . V .
22.500	1171.1102	356.84	. Q . . . V .
22.583	1173.5485	354.03	. Q . . . V .
22.667	1175.9685	351.39	. Q . . . V .
22.750	1178.3708	348.82	. Q . . . V .
22.833	1180.7559	346.31	. Q . . . V .
22.917	1183.1240	343.85	. Q . . . V .
23.000	1185.4757	341.46	. Q . . . V .
23.083	1187.8113	339.12	. Q . . . V .
23.167	1190.1311	336.83	. Q . . . V .
23.250	1192.4354	334.60	. Q . . . V .

23.333	1194.7247	332.41	. Q	.	.	.	V	.
23.417	1196.9993	330.26	. Q	.	.	.	V	.
23.500	1199.2594	328.16	. Q	.	.	.	V	.
23.583	1201.5052	326.10	. Q	.	.	.	V	.
23.667	1203.7371	324.07	. Q	.	.	.	V.	
23.750	1205.9552	322.07	. Q	.	.	.	V.	
23.833	1208.1598	320.11	. Q	.	.	.	V.	
23.917	1210.3512	318.19	. Q	.	.	.	V.	
24.000	1212.5297	316.31	. Q	.	.	.	V.	
24.083	1214.6760	311.65	. Q	.	.	.	V.	
24.167	1216.7645	303.24	. Q	.	.	.	V.	
24.250	1218.7667	290.73	. Q	.	.	.	V.	
24.333	1220.6366	271.50	. Q	.	.	.	V.	
24.417	1222.3345	246.53	. Q	.	.	.	V.	
24.500	1223.8402	218.64	. Q	.	.	.	V.	
24.583	1225.1322	187.59	.Q	.	.	.	V.	
24.667	1226.1979	154.73	.Q	.	.	.	V.	
24.750	1227.0731	127.08	.Q	.	.	.	V.	
24.833	1227.7881	103.82	.Q	.	.	.	V.	
24.917	1228.3793	85.83	Q	.	.	.	V.	
25.000	1228.8730	71.70	Q	.	.	.	V.	
25.083	1229.2919	60.81	Q	.	.	.	V.	
25.167	1229.6536	52.52	Q	.	.	.	V.	
25.250	1229.9677	45.60	Q	.	.	.	V.	
25.333	1230.2433	40.03	Q	.	.	.	V.	
25.417	1230.4893	35.71	Q	.	.	.	V.	
25.500	1230.7090	31.90	Q	.	.	.	V.	
25.583	1230.9110	29.34	Q	.	.	.	V.	
25.667	1231.0967	26.95	Q	.	.	.	V.	
25.750	1231.2676	24.82	Q	.	.	.	V.	
25.833	1231.4249	22.84	Q	.	.	.	V.	
25.917	1231.5695	20.98	Q	.	.	.	V.	
26.000	1231.7025	19.32	Q	.	.	.	V.	
26.083	1231.8241	17.66	Q	.	.	.	V.	
26.167	1231.9347	16.07	Q	.	.	.	V.	
26.250	1232.0381	15.01	Q	.	.	.	V.	
26.333	1232.1345	14.00	Q	.	.	.	V.	
26.417	1232.2240	12.99	Q	.	.	.	V.	
26.500	1232.3075	12.13	Q	.	.	.	V.	
26.583	1232.3855	11.32	Q	.	.	.	V.	
26.667	1232.4579	10.52	Q	.	.	.	V.	
26.750	1232.5249	9.72	Q	.	.	.	V.	
26.833	1232.5872	9.04	Q	.	.	.	V.	
26.917	1232.6450	8.40	Q	.	.	.	V.	
27.000	1232.6985	7.77	Q	.	.	.	V.	
27.083	1232.7477	7.14	Q	.	.	.	V.	
27.167	1232.7925	6.51	Q	.	.	.	V.	
27.250	1232.8340	6.03	Q	.	.	.	V.	
27.333	1232.8726	5.60	Q	.	.	.	V.	
27.417	1232.9083	5.19	Q	.	.	.	V.	
27.500	1232.9412	4.77	Q	.	.	.	V.	
27.583	1232.9712	4.36	Q	.	.	.	V.	
27.667	1232.9984	3.94	Q	.	.	.	V.	
27.750	1233.0227	3.54	Q	.	.	.	V.	
27.833	1233.0446	3.17	Q	.	.	.	V.	
27.917	1233.0651	2.98	Q	.	.	.	V.	
28.000	1233.0845	2.82	Q	.	.	.	V.	
28.083	1233.1028	2.66	Q	.	.	.	V.	

28.167	1233.1200	2.50	Q	.	.	.	V.
28.250	1233.1361	2.35	Q	.	.	.	V.
28.333	1233.1511	2.19	Q	.	.	.	V.
28.417	1233.1652	2.03	Q	.	.	.	V.
28.500	1233.1781	1.88	Q	.	.	.	V.
28.583	1233.1899	1.73	Q	.	.	.	V.
28.667	1233.2008	1.57	Q	.	.	.	V.
28.750	1233.2106	1.42	Q	.	.	.	V.
28.833	1233.2194	1.27	Q	.	.	.	V.
28.917	1233.2271	1.12	Q	.	.	.	V.
29.000	1233.2338	0.98	Q	.	.	.	V.
29.083	1233.2395	0.83	Q	.	.	.	V.
29.167	1233.2441	0.68	Q	.	.	.	V.
29.250	1233.2478	0.54	Q	.	.	.	V.
29.333	1233.2505	0.39	Q	.	.	.	V.
29.417	1233.2522	0.25	Q	.	.	.	V.
29.500	1233.2529	0.10	Q	.	.	.	V.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1770.0
10%	870.0
20%	235.0
30%	145.0
40%	80.0
50%	60.0
60%	50.0
70%	40.0
80%	30.0
90%	20.0

END OF FLOODSCx ROUTING ANALYSIS

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

            F L O O D    R O U T I N G    A N A L Y S I S
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                        Analysis prepared by:

                           RBF Consulting
                         14257 Alton Parkway
                              Irvine, CA
                                92618

 ************************* DESCRIPTION OF STUDY *************************
* REDLANDS MASTER PLAN OF DRAINAGE                                      *
* UNIT HYDROGRAPH MODEL -  NODE 20538                                   *
* BY TMULI   JN: 136769  FEBRUARY 2014                                  *
 ************************************************************************

  FILE NAME: 20538.DAT
  TIME/DATE OF STUDY: 11:07 02/27/2014


**************************************************************************
  FLOW PROCESS FROM NODE  20500.00 TO NODE  20538.00 IS CODE =   1
--------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
==========================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =     543.390 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.464 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY(DEVELOPED):
                  "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.983
         FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.000
         MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.000
         VALLEY(UNDEVELOPED)/DESERT:
                  "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.017
         DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.000
         MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) =  0.500
         LOW LOSS FRACTION = 0.556
         *HYDROGRAPH MODEL #1 SPECIFIED*

         SPECIFIED PEAK  5-MINUTES RAINFALL(INCH)=  0.46
         SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)=  0.95
         SPECIFIED PEAK  1-HOUR RAINFALL(INCH) =  1.25
         SPECIFIED PEAK  3-HOUR RAINFALL(INCH) =  2.03
         SPECIFIED PEAK  6-HOUR RAINFALL(INCH) =  2.75
         SPECIFIED PEAK 24-HOUR RAINFALL(INCH) =  5.50

         *USER SPECIFIED PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
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          5-MINUTE FACTOR = 0.976
         30-MINUTE FACTOR = 0.976
          1-HOUR FACTOR = 0.976
          3-HOUR FACTOR = 0.996
          6-HOUR FACTOR = 0.998
         24-HOUR FACTOR = 0.999

       UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
       UNIT INTERVAL PERCENTAGE OF LAG-TIME =  17.960
```

UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	1.035	68.037
2	3.871	186.339
3	10.645	445.152
4	21.059	684.405
5	33.122	792.722
6	48.245	993.797
7	62.899	963.029
8	74.994	794.838
9	83.285	544.839
10	88.945	371.971
11	92.699	246.706
12	95.291	170.325
13	96.901	105.827
14	97.876	64.050
15	98.239	23.873
16	98.595	23.354
17	98.947	23.186
18	99.297	22.964
19	99.646	22.929
20	99.836	12.483
21	99.850	0.934
22	99.864	0.909
23	99.875	0.766
24	99.887	0.743
25	99.898	0.724
26	99.907	0.609
27	99.916	0.590
28	99.925	0.590
29	99.933	0.539
30	99.939	0.397
31	99.945	0.390
32	99.951	0.389
33	99.957	0.390
34	99.963	0.390
35	99.967	0.272
36	99.969	0.144
37	99.971	0.144
38	99.974	0.144
39	99.976	0.143

40	99.978	0.144
41	99.980	0.144
42	99.982	0.144
43	99.985	0.143
44	99.987	0.144
45	99.989	0.144
46	99.991	0.144
47	99.993	0.144
48	99.996	0.144
49	99.998	0.144
50	100.000	0.144
51	100.000	0.006
52	100.000	0.000
53	100.000	0.000
54	100.000	0.000
55	100.000	0.000
56	100.000	0.000
57	100.000	0.000
58	100.000	0.000
59	100.000	0.000
60	100.000	0.000
61	100.000	0.000
62	100.000	0.000
63	100.000	0.000
64	100.000	0.000
65	100.000	0.000
66	100.000	0.000
67	100.000	0.000
68	100.000	0.000
69	100.000	0.000
70	100.000	0.000
71	100.000	0.000
72	100.000	0.000
73	100.000	0.000
74	100.000	0.000
75	100.000	0.000
76	100.000	0.000
77	100.000	0.000
78	100.000	0.000
79	100.000	0.000
80	100.000	0.000

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 126.0642

TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 122.6542

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2 4 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

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HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	175.0	350.0	525.0	700.0
0.083	0.0020	0.29	Q	.	.	.	.
0.167	0.0094	1.08	Q	.	.	.	.
0.250	0.0299	2.97	Q	.	.	.	.
0.333	0.0704	5.88	Q	.	.	.	.
0.417	0.1342	9.26	Q	.	.	.	.
0.500	0.2271	13.50	Q	.	.	.	.
0.583	0.3485	17.62	VQ	.	.	.	.
0.667	0.4933	21.04	VQ	.	.	.	.
0.750	0.6545	23.40	VQ	.	.	.	.
0.833	0.8270	25.04	VQ	.	.	.	.
0.917	1.0071	26.15	VQ	.	.	.	.
1.000	1.1927	26.95	VQ	.	.	.	.
1.083	1.3819	27.47	VQ	.	.	.	.
1.167	1.5734	27.81	VQ	.	.	.	.
1.250	1.7662	27.99	VQ	.	.	.	.
1.333	1.9602	28.17	VQ	.	.	.	.
1.417	2.1554	28.34	VQ	.	.	.	.
1.500	2.3518	28.52	VQ	.	.	.	.
1.583	2.5494	28.69	VQ	.	.	.	.
1.667	2.7480	28.83	VQ	.	.	.	.
1.750	2.9471	28.91	VQ	.	.	.	.
1.833	3.1468	29.00	.Q	.	.	.	.
1.917	3.3471	29.08	.Q	.	.	.	.
2.000	3.5480	29.17	.Q	.	.	.	.
2.083	3.7495	29.26	.Q	.	.	.	.
2.167	3.9516	29.34	.Q	.	.	.	.
2.250	4.1543	29.43	.Q	.	.	.	.
2.333	4.3576	29.52	.Q	.	.	.	.
2.417	4.5615	29.61	.Q	.	.	.	.
2.500	4.7661	29.70	.Q	.	.	.	.
2.583	4.9712	29.79	.Q	.	.	.	.
2.667	5.1770	29.88	.Q	.	.	.	.
2.750	5.3834	29.97	.Q	.	.	.	.
2.833	5.5905	30.06	.Q	.	.	.	.
2.917	5.7982	30.16	.Q	.	.	.	.
3.000	6.0065	30.25	.Q	.	.	.	.
3.083	6.2155	30.34	.QV	.	.	.	.
3.167	6.4251	30.44	.QV	.	.	.	.
3.250	6.6354	30.53	.QV	.	.	.	.
3.333	6.8463	30.63	.QV	.	.	.	.
3.417	7.0580	30.73	.QV	.	.	.	.
3.500	7.2703	30.83	.QV	.	.	.	.
3.583	7.4833	30.93	.QV	.	.	.	.
3.667	7.6969	31.03	.QV	.	.	.	.
3.750	7.9113	31.13	.QV	.	.	.	.
3.833	8.1264	31.23	.QV	.	.	.	.
3.917	8.3422	31.33	.QV	.	.	.	.

4.000	8.5587	31.44	.QV	.	.	.	.
4.083	8.7759	31.54	.QV	.	.	.	.
4.167	8.9939	31.65	.QV	.	.	.	.
4.250	9.2126	31.76	.Q V	.	.	.	.
4.333	9.4320	31.86	.Q V	.	.	.	.
4.417	9.6522	31.97	.Q V	.	.	.	.
4.500	9.8732	32.08	.Q V	.	.	.	.
4.583	10.0949	32.19	.Q V	.	.	.	.
4.667	10.3174	32.31	.Q V	.	.	.	.
4.750	10.5407	32.42	.Q V	.	.	.	.
4.833	10.7647	32.54	.Q V	.	.	.	.
4.917	10.9896	32.65	.Q V	.	.	.	.
5.000	11.2153	32.77	.Q V	.	.	.	.
5.083	11.4418	32.89	.Q V	.	.	.	.
5.167	11.6691	33.01	.Q V	.	.	.	.
5.250	11.8973	33.13	.Q V	.	.	.	.
5.333	12.1263	33.25	.Q V	.	.	.	.
5.417	12.3561	33.37	.Q V	.	.	.	.
5.500	12.5868	33.50	.Q V	.	.	.	.
5.583	12.8184	33.63	.Q V	.	.	.	.
5.667	13.0509	33.76	.Q V	.	.	.	.
5.750	13.2843	33.88	.Q V	.	.	.	.
5.833	13.5185	34.02	.Q V	.	.	.	.
5.917	13.7537	34.15	.Q V	.	.	.	.
6.000	13.9898	34.28	.Q V	.	.	.	.
6.083	14.2269	34.42	.Q V	.	.	.	.
6.167	14.4649	34.56	.Q V	.	.	.	.
6.250	14.7038	34.70	.Q V	.	.	.	.
6.333	14.9438	34.84	.Q V	.	.	.	.
6.417	15.1847	34.98	.Q V	.	.	.	.
6.500	15.4266	35.13	. Q V	.	.	.	.
6.583	15.6695	35.27	. Q V	.	.	.	.
6.667	15.9134	35.42	. Q V	.	.	.	.
6.750	16.1584	35.57	. Q V	.	.	.	.
6.833	16.4044	35.72	. Q V	.	.	.	.
6.917	16.6515	35.87	. Q V	.	.	.	.
7.000	16.8996	36.03	. Q V	.	.	.	.
7.083	17.1489	36.19	. Q V	.	.	.	.
7.167	17.3992	36.35	. Q V	.	.	.	.
7.250	17.6506	36.51	. Q V	.	.	.	.
7.333	17.9032	36.68	. Q V	.	.	.	.
7.417	18.1570	36.84	. Q V	.	.	.	.
7.500	18.4119	37.01	. Q V	.	.	.	.
7.583	18.6679	37.18	. Q V	.	.	.	.
7.667	18.9252	37.36	. Q V	.	.	.	.
7.750	19.1837	37.53	. Q V	.	.	.	.
7.833	19.4434	37.71	. Q V	.	.	.	.
7.917	19.7044	37.89	. Q V	.	.	.	.
8.000	19.9666	38.08	. Q V	.	.	.	.
8.083	20.2301	38.26	. Q V	.	.	.	.
8.167	20.4950	38.45	. Q V	.	.	.	.
8.250	20.7611	38.64	. Q V	.	.	.	.
8.333	21.0286	38.84	. Q V	.	.	.	.
8.417	21.2974	39.04	. Q V	.	.	.	.
8.500	21.5677	39.24	. Q V	.	.	.	.
8.583	21.8393	39.44	. Q V	.	.	.	.
8.667	22.1124	39.65	. Q V	.	.	.	.
8.750	22.3869	39.86	. Q V	.	.	.	.

8.833	22.6629	40.08	. Q V	.	.	.	.
8.917	22.9404	40.29	. Q V	.	.	.	.
9.000	23.2195	40.52	. Q V	.	.	.	.
9.083	23.5001	40.74	. Q V	.	.	.	.
9.167	23.7822	40.97	. Q V	.	.	.	.
9.250	24.0660	41.20	. Q V	.	.	.	.
9.333	24.3514	41.44	. Q V	.	.	.	.
9.417	24.6384	41.68	. Q V	.	.	.	.
9.500	24.9272	41.93	. Q V	.	.	.	.
9.583	25.2176	42.17	. Q V	.	.	.	.
9.667	25.5099	42.43	. Q V	.	.	.	.
9.750	25.8038	42.69	. Q V	.	.	.	.
9.833	26.0997	42.95	. Q V	.	.	.	.
9.917	26.3973	43.22	. Q V	.	.	.	.
10.000	26.6969	43.49	. Q V	.	.	.	.
10.083	26.9983	43.77	. Q V	.	.	.	.
10.167	27.3018	44.06	. Q V	.	.	.	.
10.250	27.6072	44.35	. Q V.	.	.	.	.
10.333	27.9147	44.64	. Q V.	.	.	.	.
10.417	28.2242	44.95	. Q V.	.	.	.	.
10.500	28.5359	45.25	. Q V.	.	.	.	.
10.583	28.8497	45.57	. Q V.	.	.	.	.
10.667	29.1658	45.89	. Q V.	.	.	.	.
10.750	29.4841	46.22	. Q V.	.	.	.	.
10.833	29.8047	46.55	. Q V.	.	.	.	.
10.917	30.1277	46.90	. Q V.	.	.	.	.
11.000	30.4531	47.25	. Q V.	.	.	.	.
11.083	30.7809	47.60	. Q V	.	.	.	.
11.167	31.1113	47.97	. Q V	.	.	.	.
11.250	31.4443	48.35	. Q V	.	.	.	.
11.333	31.7799	48.73	. Q V	.	.	.	.
11.417	32.1182	49.12	. Q V	.	.	.	.
11.500	32.4593	49.53	. Q V	.	.	.	.
11.583	32.8033	49.94	. Q V	.	.	.	.
11.667	33.1502	50.37	. Q V	.	.	.	.
11.750	33.5000	50.80	. Q V	.	.	.	.
11.833	33.8530	51.25	. Q .V	.	.	.	.
11.917	34.2091	51.71	. Q .V	.	.	.	.
12.000	34.5685	52.18	. Q .V	.	.	.	.
12.083	34.9307	52.59	. Q .V	.	.	.	.
12.167	35.2950	52.90	. Q .V	.	.	.	.
12.250	35.6598	52.96	. Q .V	.	.	.	.
12.333	36.0234	52.80	. Q .V	.	.	.	.
12.417	36.3852	52.53	. Q .V	.	.	.	.
12.500	36.7439	52.09	. Q .V	.	.	.	.
12.583	37.0999	51.68	. Q . V	.	.	.	.
12.667	37.4543	51.47	. Q . V	.	.	.	.
12.750	37.8092	51.53	. Q . V	.	.	.	.
12.833	38.1659	51.78	. Q . V	.	.	.	.
12.917	38.5253	52.19	. Q . V	.	.	.	.
13.000	38.8882	52.69	. Q . V	.	.	.	.
13.083	39.2552	53.29	. Q . V	.	.	.	.
13.167	39.6267	53.96	. Q . V	.	.	.	.
13.250	40.0034	54.69	. Q . V	.	.	.	.
13.333	40.3853	55.46	. Q . V	.	.	.	.
13.417	40.7727	56.25	. Q . V	.	.	.	.
13.500	41.1659	57.09	. Q . V	.	.	.	.
13.583	41.5651	57.96	. Q . V	.	.	.	.

13.667	41.9707	58.89	. Q . V . . .
13.750	42.3829	59.86	. Q . V . . .
13.833	42.8023	60.89	. Q . V . . .
13.917	43.2291	61.97	. Q . V . . .
14.000	43.6637	63.10	. Q . V . . .
14.083	44.1067	64.33	. Q . V . . .
14.167	44.5591	65.68	. Q . V . . .
14.250	45.0221	67.23	. Q . V . . .
14.333	45.4972	68.99	. Q . V . . .
14.417	45.9854	70.88	. Q . V . . .
14.500	46.4879	72.97	. Q . V . . .
14.583	47.0055	75.15	. Q . V . . .
14.667	47.5384	77.38	. Q . V . . .
14.750	48.0867	79.61	. Q . V . . .
14.833	48.6509	81.92	. Q . V . . .
14.917	49.2316	84.32	. Q . V . . .
15.000	49.8301	86.90	. Q . V . . .
15.083	50.4477	89.66	. Q . V . . .
15.167	51.0860	92.68	. Q . V . . .
15.250	51.7470	95.98	. Q . V . . .
15.333	52.4333	99.66	. Q . V . . .
15.417	53.1466	103.57	. Q . V . . .
15.500	53.8883	107.70	. Q . V . . .
15.583	54.6579	111.74	. Q . V . . .
15.667	55.4565	115.97	. Q . V . . .
15.750	56.2904	121.08	. Q . V . . .
15.833	57.1674	127.34	. Q . V . . .
15.917	58.1162	137.76	. Q . V . . .
16.000	59.1983	157.12	. Q . V . . .
16.083	60.6535	211.31	. . Q V . . .
16.167	62.6859	295.10	. . Q V . . .
16.250	65.6163	425.49	. . .V Q . . .
16.333	69.3389	540.52	. . . V Q . .
16.417	73.4740	600.43	. . . V . Q .
16.500	78.0689	667.17	. . . V . Q .
16.583	82.4204	631.84	. . . V . Q .
16.667	86.1041	534.88	. . . V Q . .
16.750	88.9262	409.76	. . . Q V . .
16.833	91.1096	317.04	. . Q . V . .
16.917	92.8162	247.79	. . Q . V . .
17.000	94.1963	200.40	. .Q . V . .
17.083	95.3057	161.07	. Q. . .V . .
17.167	96.2219	133.04	. Q . . .V . .
17.250	96.9784	109.84	. Q . . .V . .
17.333	97.6844	102.52	. Q . . .V . .
17.417	98.3505	96.72	. Q . . . V . .
17.500	98.9787	91.22	. Q . . . V . .
17.583	99.5679	85.54	. Q . . . V . .
17.667	100.0969	76.82	. Q . . . V . .
17.750	100.5713	68.88	. Q . . . V . .
17.833	101.0236	65.68	. Q . . . V . .
17.917	101.4577	63.03	. Q . . . V . .
18.000	101.8759	60.72	. Q . . . V . .
18.083	102.2803	58.71	. Q . . . V . .
18.167	102.6729	57.00	. Q . . . V . .
18.250	103.0570	55.77	. Q . . . V . .
18.333	103.4352	54.92	. Q . . . V . .
18.417	103.8089	54.27	. Q . . . V . .

18.500	104.1801	53.90	. Q . . . V .
18.583	104.5494	53.63	. Q . . . V .
18.667	104.9164	53.28	. Q . . . V .
18.750	105.2796	52.74	. Q . . . V .
18.833	105.6384	52.09	. Q . . . V .
18.917	105.9918	51.32	. Q . . . V .
19.000	106.3398	50.53	. Q . . . V .
19.083	106.6826	49.77	. Q . . . V .
19.167	107.0202	49.02	. Q . . . V .
19.250	107.3525	48.26	. Q . . . V .
19.333	107.6799	47.54	. Q . . . V .
19.417	108.0026	46.85	. Q . . . V .
19.500	108.3207	46.19	. Q . . . V .
19.583	108.6346	45.57	. Q . . . V .
19.667	108.9442	44.96	. Q . . . V .
19.750	109.2497	44.36	. Q . . . V .
19.833	109.5512	43.78	. Q . . . V .
19.917	109.8489	43.23	. Q . . . V .
20.000	110.1430	42.70	. Q . . . V .
20.083	110.4335	42.18	. Q . . . V .
20.167	110.7205	41.67	. Q . . . V .
20.250	111.0038	41.14	. Q . . . V .
20.333	111.2839	40.67	. Q . . . V .
20.417	111.5609	40.23	. Q . . . V .
20.500	111.8350	39.79	. Q . . . V .
20.583	112.1062	39.37	. Q . . . V .
20.667	112.3746	38.97	. Q . . . V .
20.750	112.6402	38.58	. Q . . . V .
20.833	112.9033	38.20	. Q . . . V .
20.917	113.1638	37.83	. Q . . . V .
21.000	113.4218	37.47	. Q . . . V .
21.083	113.6775	37.12	. Q . . . V .
21.167	113.9308	36.78	. Q . . . V .
21.250	114.1818	36.45	. Q . . . V .
21.333	114.4306	36.13	. Q . . . V .
21.417	114.6772	35.81	. Q . . . V .
21.500	114.9218	35.51	. Q . . . V .
21.583	115.1643	35.21	. Q . . . V .
21.667	115.4048	34.92	.Q . . . V .
21.750	115.6433	34.64	.Q . . . V .
21.833	115.8800	34.36	.Q . . . V .
21.917	116.1148	34.09	.Q . . . V .
22.000	116.3478	33.83	.Q . . . V .
22.083	116.5790	33.57	.Q . . . V .
22.167	116.8085	33.32	.Q . . . V .
22.250	117.0363	33.08	.Q . . . V .
22.333	117.2624	32.83	.Q . . . V .
22.417	117.4869	32.60	.Q . . . V .
22.500	117.7098	32.37	.Q . . . V .
22.583	117.9312	32.14	.Q . . . V .
22.667	118.1511	31.92	.Q . . . V .
22.750	118.3694	31.71	.Q . . . V .
22.833	118.5863	31.49	.Q . . . V .
22.917	118.8018	31.29	.Q . . . V .
23.000	119.0159	31.08	.Q . . . V .
23.083	119.2286	30.88	.Q . . . V .
23.167	119.4399	30.69	.Q . . . V .
23.250	119.6500	30.50	.Q . . . V.

23.333	119.8587	30.31	.Q	.	.	.	V.
23.417	120.0661	30.12	.Q	.	.	.	V.
23.500	120.2723	29.94	.Q	.	.	.	V.
23.583	120.4773	29.76	.Q	.	.	.	V.
23.667	120.6811	29.59	.Q	.	.	.	V.
23.750	120.8836	29.41	.Q	.	.	.	V.
23.833	121.0850	29.24	.Q	.	.	.	V.
23.917	121.2853	29.08	.Q	.	.	.	V.
24.000	121.4844	28.91	.Q	.	.	.	V.
24.083	121.6805	28.47	.Q	.	.	.	V.
24.167	121.8700	27.52	.Q	.	.	.	V.
24.250	122.0455	25.48	.Q	.	.	.	V.
24.333	122.2001	22.45	.Q	.	.	.	V.
24.417	122.3307	18.97	.Q	.	.	.	V.
24.500	122.4317	14.66	Q	.	.	.	V.
24.583	122.5040	10.50	Q	.	.	.	V.
24.667	122.5528	7.08	Q	.	.	.	V.
24.750	122.5853	4.73	Q	.	.	.	V.
24.833	122.6069	3.13	Q	.	.	.	V.
24.917	122.6212	2.07	Q	.	.	.	V.
25.000	122.6304	1.34	Q	.	.	.	V.
25.083	122.6364	0.88	Q	.	.	.	V.
25.167	122.6406	0.61	Q	.	.	.	V.
25.250	122.6441	0.50	Q	.	.	.	V.
25.333	122.6468	0.40	Q	.	.	.	V.
25.417	122.6489	0.30	Q	.	.	.	V.
25.500	122.6502	0.20	Q	.	.	.	V.
25.583	122.6509	0.10	Q	.	.	.	V.
25.667	122.6513	0.05	Q	.	.	.	V.
25.750	122.6516	0.04	Q	.	.	.	V.
25.833	122.6519	0.04	Q	.	.	.	V.
25.917	122.6521	0.04	Q	.	.	.	V.
26.000	122.6523	0.03	Q	.	.	.	V.
26.083	122.6525	0.03	Q	.	.	.	V.
26.167	122.6527	0.03	Q	.	.	.	V.
26.250	122.6529	0.02	Q	.	.	.	V.
26.333	122.6531	0.02	Q	.	.	.	V.
26.417	122.6532	0.02	Q	.	.	.	V.
26.500	122.6533	0.02	Q	.	.	.	V.
26.583	122.6534	0.02	Q	.	.	.	V.
26.667	122.6535	0.01	Q	.	.	.	V.
26.750	122.6536	0.01	Q	.	.	.	V.
26.833	122.6537	0.01	Q	.	.	.	V.
26.917	122.6537	0.01	Q	.	.	.	V.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1615.0
10%	215.0
20%	75.0
30%	60.0
40%	45.0
50%	35.0

60%	35.0
70%	25.0
80%	25.0
90%	10.0

END OF FLOODSCx ROUTING ANALYSIS

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

            F L O O D   R O U T I N G   A N A L Y S I S
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                        Analysis prepared by:

                            RBF Consulting
                         14257 Alton Parkway
                              Irvine, CA
                                92618

 ************************* DESCRIPTION OF STUDY *************************
* REDLANDS MASTER PLAN OF DRAINAGE                                      *
* UNIT HYDROGRAPH MODEL - NODE 20539 - REGIONAL                         *
* BY TMULI   JN: 136769  FEBRUARY 201                                   *
 ************************************************************************

  FILE NAME: 20539.DAT
  TIME/DATE OF STUDY: 11:08 02/24/2014


**************************************************************************
  FLOW PROCESS FROM NODE  20120.00 TO NODE  20539.00 IS CODE =   1
--------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
==========================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =    5998.300 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.620 HOURS
         VALLEY(DEVELOPED):
                  "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.664
         FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.000
         MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.000
         VALLEY(UNDEVELOPED)/DESERT:
                  "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.336
         DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.000
         MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) =  0.550
         LOW LOSS FRACTION = 0.530
         *HYDROGRAPH MODEL #1 SPECIFIED*

         SPECIFIED PEAK  5-MINUTES RAINFALL(INCH)=  0.45
         SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)=  0.93
         SPECIFIED PEAK  1-HOUR RAINFALL(INCH) =  1.23
         SPECIFIED PEAK  3-HOUR RAINFALL(INCH) =  2.04
         SPECIFIED PEAK  6-HOUR RAINFALL(INCH) =  2.81
         SPECIFIED PEAK 24-HOUR RAINFALL(INCH) =  6.67

         PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
           5-MINUTE FACTOR = 0.760
          30-MINUTE FACTOR = 0.760
           1-HOUR FACTOR = 0.760
```



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           3-HOUR FACTOR = 0.962
           6-HOUR FACTOR = 0.980
          24-HOUR FACTOR = 0.988

         UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  13.441
```

UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	0.887	643.587
2	2.950	1496.212
3	6.404	2505.656
4	12.373	4330.387
5	20.240	5706.610
6	29.054	6393.868
7	39.116	7298.835
8	50.201	8041.475
9	59.837	6990.405
10	68.207	6071.632
11	74.588	4629.004
12	79.582	3622.370
13	83.347	2731.381
14	86.124	2014.280
15	88.426	1670.249
16	90.190	1279.562
17	91.495	946.473
18	92.621	816.794
19	93.270	471.358
20	93.854	423.158
21	94.382	383.309
22	94.879	360.778
23	95.353	343.289
24	95.782	311.466
25	96.215	313.973
26	96.628	300.026
27	96.846	157.822
28	97.056	152.371
29	97.264	151.170
30	97.443	129.347
31	97.610	121.311
32	97.777	121.344
33	97.943	120.459
34	98.085	103.136
35	98.218	96.339
36	98.351	96.411
37	98.484	96.267
38	98.616	95.703
39	98.718	74.024
40	98.805	63.542
41	98.893	63.680
42	98.981	63.542

43	99.069	63.680
44	99.156	63.542
45	99.244	63.686
46	99.323	57.592
47	99.362	27.839
48	99.394	23.516
49	99.427	23.516
50	99.459	23.516
51	99.491	23.450
52	99.524	23.588
53	99.556	23.450
54	99.589	23.588
55	99.621	23.444
56	99.654	23.588
57	99.686	23.450
58	99.718	23.450
59	99.750	23.444
60	99.783	23.450
61	99.815	23.450
62	99.847	23.444
63	99.880	23.450
64	99.912	23.444
65	99.944	23.450
66	99.977	23.450
67	100.000	16.853
68	100.000	0.000
69	100.000	0.000
70	100.000	0.000
71	100.000	0.000
72	100.000	0.000
73	100.000	0.000
74	100.000	0.000
75	100.000	0.000
76	100.000	0.000
77	100.000	0.000
78	100.000	0.000
79	100.000	0.000
80	100.000	0.000
81	100.000	0.000
82	100.000	0.000
83	100.000	0.000
84	100.000	0.000
85	100.000	0.000
86	100.000	0.000
87	100.000	0.000
88	100.000	0.000
89	100.000	0.000
90	100.000	0.000
91	100.000	0.000
92	100.000	0.000
93	100.000	0.000
94	100.000	0.000
95	100.000	0.000
96	100.000	0.000
97	100.000	0.000
98	100.000	0.000
99	100.000	0.000
100	100.000	0.000

101	100.000	0.000
102	100.000	0.000
103	100.000	0.000
104	100.000	0.000
105	100.000	0.000
106	100.000	0.000
107	100.000	0.000

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 1671.3007

TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 1621.3633

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2 4 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 1075.0 2150.0 3225.0 4300.0
0.083	0.0300	4.36	Q . . . .
0.167	0.1298	14.49	Q . . . .
0.250	0.3466	31.48	Q . . . .
0.333	0.7656	60.84	Q . . . .
0.417	1.4514	99.58	Q . . . .
0.500	2.4365	143.04	VQ . . . .
0.583	3.7637	192.71	VQ . . . .
0.667	5.4683	247.50	V Q . . . .
0.750	7.5019	295.29	V Q . . . .
0.833	9.8226	336.96	V Q . . . .
0.917	12.3635	368.94	V Q . . . .
1.000	15.0782	394.18	V Q . . . .
1.083	17.9257	413.45	V Q . . . .
1.167	20.8727	427.91	V Q . . . .
1.250	23.9034	440.06	V Q . . . .
1.333	26.9999	449.61	V Q . . . .
1.417	30.1467	456.92	V Q . . . .
1.500	33.3380	463.38	V Q . . . .
1.583	36.5578	467.51	V Q . . . .
1.667	39.8040	471.34	V Q . . . .
1.750	43.0746	474.90	.V Q . . . .
1.833	46.3689	478.33	.V Q . . . .
1.917	49.6861	481.65	.V Q . . . .
2.000	53.0248	484.78	.V Q . . . .
2.083	56.3851	487.92	.V Q . . . .
2.167	59.7666	490.99	.V Q . . . .
2.250	63.1626	493.10	.V Q . . . .
2.333	66.5730	495.19	.V Q . . . .
2.417	69.9978	497.28	.V Q . . . .
2.500	73.4360	499.23	.V Q . . . .
2.583	76.8874	501.14	.V Q . . . .
2.667	80.3520	503.06	.V Q . . . .
2.750	83.8299	504.98	. V Q . . . .
2.833	87.3203	506.81	. V Q . . . .
2.917	90.8229	508.58	. V Q . . . .
3.000	94.3380	510.38	. V Q . . . .
3.083	97.8654	512.18	. V Q . . . .
3.167	101.4053	514.00	. V Q . . . .
3.250	104.9567	515.67	. V Q . . . .
3.333	108.5193	517.29	. V Q . . . .
3.417	112.0930	518.91	. V Q . . . .
3.500	115.6781	520.55	. V Q . . . .
3.583	119.2745	522.19	. V Q . . . .
3.667	122.8823	523.86	. VQ . . . .
3.750	126.5016	525.53	. VQ . . . .
3.833	130.1323	527.17	. VQ . . . .
3.917	133.7729	528.62	. VQ . . . .

4.000	137.4235	530.06	. VQ . . . .
4.083	141.0840	531.50	. VQ . . . .
4.167	144.7546	532.97	. VQ . . . .
4.250	148.4352	534.43	. VQ . . . .
4.333	152.1262	535.92	. VQ . . . .
4.417	155.8274	537.42	. VQ . . . .
4.500	159.5390	538.93	. V Q . . . .
4.583	163.2611	540.45	. VQ . . . .
4.667	166.9938	541.99	. VQ . . . .
4.750	170.7371	543.53	. VQ . . . .
4.833	174.4913	545.10	. VQ . . . .
4.917	178.2562	546.67	. VQ . . . .
5.000	182.0321	548.26	. VQ . . . .
5.083	185.8191	549.86	. VQ . . . .
5.167	189.6172	551.49	. VQ . . . .
5.250	193.4265	553.11	. VQ . . . .
5.333	197.2472	554.77	. VQ . . . .
5.417	201.0793	556.43	. VQ . . . .
5.500	204.9231	558.11	. Q . . . .
5.583	208.7782	559.76	. Q . . . .
5.667	212.6440	561.31	. Q . . . .
5.750	216.5205	562.88	. Q . . . .
5.833	220.4080	564.47	. Q . . . .
5.917	224.3065	566.06	. Q . . . .
6.000	228.2162	567.69	. Q . . . .
6.083	232.1371	569.32	. Q . . . .
6.167	236.0694	570.97	. Q . . . .
6.250	240.0132	572.64	. Q . . . .
6.333	243.9687	574.34	. QV . . . .
6.417	247.9359	576.04	. QV . . . .
6.500	251.9150	577.77	. QV . . . .
6.583	255.9061	579.51	. QV . . . .
6.667	259.9095	581.28	. QV . . . .
6.750	263.9250	583.06	. QV . . . .
6.833	267.9531	584.87	. QV . . . .
6.917	271.9937	586.69	. QV . . . .
7.000	276.0470	588.55	. QV . . . .
7.083	280.1133	590.41	. QV . . . .
7.167	284.1925	592.31	. Q V . . . .
7.250	288.2850	594.22	. Q V . . . .
7.333	292.3908	596.17	. Q V . . . .
7.417	296.5101	598.12	. Q V . . . .
7.500	300.6431	600.12	. Q V . . . .
7.583	304.7899	602.12	. Q V . . . .
7.667	308.9508	604.16	. Q V . . . .
7.750	313.1259	606.22	. Q V . . . .
7.833	317.3154	608.31	. Q V . . . .
7.917	321.5194	610.42	. Q V . . . .
8.000	325.7382	612.57	. Q V . . . .
8.083	329.9719	614.74	. Q V . . . .
8.167	334.2208	616.94	. Q V . . . .
8.250	338.4850	619.16	. Q V . . . .
8.333	342.7649	621.43	. Q V . . . .
8.417	347.0604	623.71	. Q V . . . .
8.500	351.3720	626.05	. Q V . . . .
8.583	355.6998	628.39	. Q V . . . .
8.667	360.0441	630.79	. Q V . . . .
8.750	364.4050	633.20	. Q V . . . .

8.833	368.7828	635.67	.	Q	V.	.	.	.	
8.917	373.1778	638.15	.	Q	V.	.	.	.	
9.000	377.5903	640.69	.	Q	V.	.	.	.	
9.083	382.0204	643.25	.	Q	V.	.	.	.	
9.167	386.4684	645.86	.	Q	V.	.	.	.	
9.250	390.9347	648.50	.	Q	V.	.	.	.	
9.333	395.4194	651.19	.	Q	V.	.	.	.	
9.417	399.9229	653.91	.	Q	V.	.	.	.	
9.500	404.4456	656.69	.	Q	V.	.	.	.	
9.583	408.9875	659.49	.	Q	V	.	.	.	
9.667	413.5493	662.36	.	Q	V	.	.	.	
9.750	418.1310	665.26	.	Q	V	.	.	.	
9.833	422.7330	668.22	.	Q	V	.	.	.	
9.917	427.3557	671.22	.	Q	V	.	.	.	
10.000	431.9995	674.28	.	Q	V	.	.	.	
10.083	436.6647	677.38	.	Q	V	.	.	.	
10.167	441.3517	680.55	.	Q	V	.	.	.	
10.250	446.0607	683.75	.	Q	.V	.	.	.	
10.333	450.7924	687.04	.	Q	.V	.	.	.	
10.417	455.5469	690.36	.	Q	.V	.	.	.	
10.500	460.3249	693.76	.	Q	.V	.	.	.	
10.583	465.1266	697.21	.	Q	.V	.	.	.	
10.667	469.9526	700.74	.	Q	.V	.	.	.	
10.750	474.8033	704.32	.	Q	.V	.	.	.	
10.833	479.6792	707.98	.	Q	.V	.	.	.	
10.917	484.5807	711.70	.	Q	.V	.	.	.	
11.000	489.5085	715.52	.	Q	. V	.	.	.	
11.083	494.4629	719.38	.	Q	. V	.	.	.	
11.167	499.4447	723.35	.	Q	. V	.	.	.	
11.250	504.4542	727.38	.	Q	. V	.	.	.	
11.333	509.4922	731.52	.	Q	. V	.	.	.	
11.417	514.5592	735.72	.	Q	. V	.	.	.	
11.500	519.6559	740.04	.	Q	. V	.	.	.	
11.583	524.7828	744.43	.	Q	. V	.	.	.	
11.667	529.9409	748.94	.	Q	. V	.	.	.	
11.750	535.1305	753.53	.	Q	. V	.	.	.	
11.833	540.3527	758.26	.	Q	. V	.	.	.	
11.917	545.6080	763.07	.	Q	. V	.	.	.	
12.000	550.8974	768.02	.	Q	. V	.	.	.	
12.083	556.2104	771.45	.	Q	. V	.	.	.	
12.167	561.5333	772.89	.	Q	. V	.	.	.	
12.250	566.8494	771.89	.	Q	. V	.	.	.	
12.333	572.1283	766.50	.	Q	. V	.	.	.	
12.417	577.3471	757.77	.	Q	. V	.	.	.	
12.500	582.4955	747.54	.	Q	. V	.	.	.	
12.583	587.5589	735.21	.	Q	. V	.	.	.	
12.667	592.5263	721.27	.	Q	. V	.	.	.	
12.750	597.4173	710.17	.	Q	. V	.	.	.	
12.833	602.2499	701.69	.	Q	. V	.	.	.	
12.917	607.0505	697.05	.	Q	. V	.	.	.	
13.000	611.8388	695.26	.	Q	. V	.	.	.	
13.083	616.6318	695.94	.	Q	. V	.	.	.	
13.167	621.4442	698.76	.	Q	. V	.	.	.	
13.250	626.2838	702.70	.	Q	. V	.	.	.	
13.333	631.1597	707.99	.	Q	. V	.	.	.	
13.417	636.0798	714.39	.	Q	. V	.	.	.	
13.500	641.0490	721.54	.	Q	. V	.	.	.	
13.583	646.0756	729.87	.	Q	. V	.	.	.	

13.667	651.1636	738.78	.	Q	.	V	.	.	.
13.750	656.3163	748.16	.	Q	.	V	.	.	.
13.833	661.5375	758.13	.	Q	.	V	.	.	.
13.917	666.8307	768.56	.	Q	.	V	.	.	.
14.000	672.2004	779.69	.	Q	.	V	.	.	.
14.083	677.6713	794.37	.	Q	.	V	.	.	.
14.167	683.2761	813.82	.	Q	.	V	.	.	.
14.250	689.0541	838.97	.	Q	.	V	.	.	.
14.333	695.0701	873.53	.	Q	.	V	.	.	.
14.417	701.3732	915.20	.	Q	.	V	.	.	.
14.500	707.9911	960.93	.	Q	.	V	.	.	.
14.583	714.9579	1011.57	.	Q	.	V	.	.	.
14.667	722.3034	1066.57	.	Q	.	V	.	.	.
14.750	729.9980	1117.25	.	Q		V	.	.	.
14.833	738.0187	1164.61	.	Q		V	.	.	.
14.917	746.3249	1206.05	.	.Q		V	.	.	.
15.000	754.8926	1244.03	.	.Q		V	.	.	.
15.083	763.7014	1279.04	.	.Q		V	.	.	.
15.167	772.7400	1312.40	.	. Q		V.		.	.
15.250	782.0096	1345.95	.	. Q		V.		.	.
15.333	791.5137	1380.01	.	. Q		V.		.	.
15.417	801.2147	1408.58	.	. Q		V.		.	.
15.500	811.0731	1431.44	.	. Q		V		.	.
15.583	821.0360	1446.61	.	. Q		V		.	.
15.667	831.0148	1448.91	.	. Q		V		.	.
15.750	840.9649	1444.76	.	. Q		V		.	.
15.833	850.9122	1444.35	.	. Q		V		.	.
15.917	860.9147	1452.38	.	. Q		.V		.	.
16.000	871.1871	1491.54	.	. Q		.V		.	.
16.083	883.1282	1733.86	.	.	Q	.V		.	.
16.167	897.3432	2064.01	.	.		Q. V		.	.
16.250	914.3760	2473.16	.	.		. VQ		.	.
16.333	935.5750	3078.10	.	.		. V	Q	.	.
16.417	959.9280	3536.05	.	.		. V		. Q	.
16.500	986.0782	3797.01	.	.		. V		. Q	.
16.583	1014.0838	4066.41	.	.		. V		. Q	.
16.667	1043.1268	4217.05	.	.		. V		. Q.	
16.750	1069.7974	3872.56	.	.		. V		. Q	.
16.833	1094.0712	3524.56	.	.		. V		. Q	.
16.917	1115.1060	3054.25	.	.		. VQ		.	.
17.000	1133.7719	2710.28	.	.		. Q V		.	.
17.083	1150.3068	2400.87	.	.		. Q	V	.	.
17.167	1165.0948	2147.23	.	.		Q.	V	.	.
17.250	1178.7528	1983.13	.	.		Q .	V.		.
17.333	1191.1704	1803.03	.	.	Q	.	V.		.
17.417	1202.4385	1636.12	.	.	Q	.	V.		.
17.500	1212.8802	1516.14	.	.	Q	.	V.		.
17.583	1222.1818	1350.57	.	. Q		.	V		.
17.667	1230.8770	1262.55	.	.Q		.	V		.
17.750	1239.0428	1185.69	.	.Q		.	V		.
17.833	1246.7638	1121.08	.	Q		.	V		.
17.917	1254.0912	1063.94	.	Q.		.	V		.
18.000	1261.0520	1010.72	.	Q.		.	.V		.
18.083	1267.7489	972.39	.	Q.		.	.V		.
18.167	1274.1810	933.94	.	Q .		.	.V		.
18.250	1280.1859	871.91	.	Q .		.	.V		.
18.333	1286.0662	853.81	.	Q .		.	.V		.
18.417	1291.8788	844.00	.	Q .		.	.V		.

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18.500  1297.6174   833.25 .      Q  .         .         . V       .
18.583  1303.3372   830.50 .      Q  .         .         . V       .
18.667  1309.0756   833.21 .      Q  .         .         . V       .
18.750  1314.8182   833.85 .      Q  .         .         . V       .
18.833  1320.5278   829.03 .      Q  .         .         . V       .
18.917  1326.2052   824.35 .      Q  .         .         . V       .
19.000  1331.8516   819.86 .      Q  .         .         . V       .
19.083  1337.4542   813.50 .      Q  .         .         . V       .
19.167  1342.9990   805.11 .      Q  .         .         .  V      .
19.250  1348.4542   792.10 .      Q  .         .         .  V      .
19.333  1353.8397   781.97 .      Q  .         .         .  V      .
19.417  1359.1730   774.39 .      Q  .         .         .  V      .
19.500  1364.4554   767.02 .      Q  .         .         .  V      .
19.583  1369.6824   758.96 .      Q  .         .         .  V      .
19.667  1374.8527   750.73 .     Q   .         .         .  V      .
19.750  1379.9650   742.31 .     Q   .         .         .   V     .
19.833  1385.0057   731.93 .     Q   .         .         .   V     .
19.917  1389.9398   716.43 .     Q   .         .         .   V     .
20.000  1394.8163   708.07 .     Q   .         .         .   V     .
20.083  1399.6470   701.42 .     Q   .         .         .   V     .
20.167  1404.4341   695.09 .     Q   .         .         .   V     .
20.250  1409.1758   688.50 .     Q   .         .         .   V     .
20.333  1413.8743   682.21 .     Q   .         .         .   V     .
20.417  1418.5305   676.09 .     Q   .         .         .   V     .
20.500  1423.1460   670.17 .     Q   .         .         .    V    .
20.583  1427.7216   664.36 .     Q   .         .         .    V    .
20.667  1432.2587   658.79 .     Q   .         .         .    V    .
20.750  1436.7581   653.31 .     Q   .         .         .    V    .
20.833  1441.2208   647.99 .     Q   .         .         .    V    .
20.917  1445.6492   642.99 .    Q    .         .         .    V    .
21.000  1450.0452   638.30 .    Q    .         .         .    V    .
21.083  1454.4095   633.72 .    Q    .         .         .    V    .
21.167  1458.7429   629.21 .    Q    .         .         .    V    .
21.250  1463.0455   624.73 .    Q    .         .         .     V   .
21.333  1467.3173   620.25 .    Q    .         .         .     V   .
21.417  1471.5580   615.75 .    Q    .         .         .     V   .
21.500  1475.7659   610.99 .    Q    .         .         .     V   .
21.583  1479.9280   604.34 .    Q    .         .         .     V   .
21.667  1484.0302   595.64 .    Q    .         .         .     V   .
21.750  1488.1044   591.57 .    Q    .         .         .     V   .
21.833  1492.1523   587.76 .    Q    .         .         .     V   .
21.917  1496.1743   583.99 .    Q    .         .         .     V   .
22.000  1500.1700   580.17 .    Q    .         .         .      V  .
22.083  1504.1401   576.46 .    Q    .         .         .      V  .
22.167  1508.0854   572.86 .    Q    .         .         .      V  .
22.250  1512.0066   569.35 .    Q    .         .         .      V  .
22.333  1515.9042   565.92 .    Q    .         .         .      V  .
22.417  1519.7787   562.58 .    Q    .         .         .      V  .
22.500  1523.6307   559.31 .    Q    .         .         .      V  .
22.583  1527.4609   556.15 .    Q    .         .         .      V  .
22.667  1531.2704   553.14 .    Q    .         .         .      V  .
22.750  1535.0596   550.19 .    Q    .         .         .      V  .
22.833  1538.8290   547.31 .    Q    .         .         .      V  .
22.917  1542.5789   544.49 .    Q    .         .         .       V .
23.000  1546.3098   541.73 .    Q    .         .         .       V .
23.083  1550.0221   539.03 .    Q    .         .         .       V .
23.167  1553.7162   536.38 .   Q     .         .         .       V .
23.250  1557.3923   533.78 .   Q     .         .         .       V .
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23.333  1561.0509   531.23 .   Q     .         .         .       V .
23.417  1564.6923   528.73 .   Q     .         .         .       V .
23.500  1568.3168   526.28 .   Q     .         .         .       V .
23.583  1571.9246   523.86 .   Q     .         .         .       V .
23.667  1575.5157   521.44 .   Q     .         .         .       V .
23.750  1579.0906   519.06 .   Q     .         .         .       V .
23.833  1582.6493   516.72 .   Q     .         .         .        V.
23.917  1586.1921   514.42 .   Q     .         .         .        V.
24.000  1589.7195   512.16 .   Q     .         .         .        V.
24.083  1593.2015   505.59 .   Q     .         .         .        V.
24.167  1596.5990   493.30 .   Q     .         .         .        V.
24.250  1599.8654   474.27 .   Q     .         .         .        V.
24.333  1602.9163   442.99 .   Q     .         .         .        V.
24.417  1605.6887   402.56 .  Q      .         .         .        V.
24.500  1608.1519   357.65 .  Q      .         .         .        V.
24.583  1610.2650   306.82 . Q       .         .         .        V.
24.667  1611.9949   251.18 . Q       .         .         .        V.
24.750  1613.3921   202.88 .Q        .         .         .        V.
24.833  1614.5007   160.98 .Q        .         .         .        V.
24.917  1615.3892   129.01 .Q        .         .         .        V.
25.000  1616.1052   103.97 Q         .         .         .        V.
25.083  1616.6910    85.06 Q         .         .         .        V.
25.167  1617.1805    71.07 Q         .         .         .        V.
25.250  1617.5901    59.47 Q         .         .         .        V.
25.333  1617.9382    50.55 Q         .         .         .        V.
25.417  1618.2408    43.93 Q         .         .         .        V.
25.500  1618.5040    38.21 Q         .         .         .        V.
25.583  1618.7440    34.85 Q         .         .         .        V.
25.667  1618.9633    31.84 Q         .         .         .        V.
25.750  1619.1637    29.10 Q         .         .         .        V.
25.833  1619.3464    26.53 Q         .         .         .        V.
25.917  1619.5123    24.09 Q         .         .         .        V.
26.000  1619.6630    21.88 Q         .         .         .        V.
26.083  1619.7983    19.65 Q         .         .         .        V.
26.167  1619.9191    17.54 Q         .         .         .        V.
26.250  1620.0320    16.39 Q         .         .         .        V.
26.333  1620.1372    15.29 Q         .         .         .        V.
26.417  1620.2350    14.20 Q         .         .         .        V.
26.500  1620.3263    13.26 Q         .         .         .        V.
26.583  1620.4115    12.38 Q         .         .         .        V.
26.667  1620.4907    11.50 Q         .         .         .        V.
26.750  1620.5640    10.64 Q         .         .         .        V.
26.833  1620.6321     9.89 Q         .         .         .        V.
26.917  1620.6954     9.20 Q         .         .         .        V.
27.000  1620.7540     8.50 Q         .         .         .        V.
27.083  1620.8079     7.81 Q         .         .         .        V.
27.167  1620.8569     7.13 Q         .         .         .        V.
27.250  1620.9023     6.60 Q         .         .         .        V.
27.333  1620.9447     6.14 Q         .         .         .        V.
27.417  1620.9839     5.69 Q         .         .         .        V.
27.500  1621.0199     5.23 Q         .         .         .        V.
27.583  1621.0529     4.78 Q         .         .         .        V.
27.667  1621.0826     4.33 Q         .         .         .        V.
27.750  1621.1094     3.88 Q         .         .         .        V.
27.833  1621.1333     3.47 Q         .         .         .        V.
27.917  1621.1558     3.27 Q         .         .         .        V.
28.000  1621.1771     3.10 Q         .         .         .        V.
28.083  1621.1973     2.92 Q         .         .         .        V.
```

28.167	1621.2162	2.75	Q	.	.	.	V.
28.250	1621.2340	2.58	Q	.	.	.	V.
28.333	1621.2506	2.41	Q	.	.	.	V.
28.417	1621.2661	2.24	Q	.	.	.	V.
28.500	1621.2804	2.07	Q	.	.	.	V.
28.583	1621.2936	1.91	Q	.	.	.	V.
28.667	1621.3055	1.74	Q	.	.	.	V.
28.750	1621.3164	1.57	Q	.	.	.	V.
28.833	1621.3262	1.41	Q	.	.	.	V.
28.917	1621.3347	1.25	Q	.	.	.	V.
29.000	1621.3422	1.08	Q	.	.	.	V.
29.083	1621.3485	0.92	Q	.	.	.	V.
29.167	1621.3538	0.76	Q	.	.	.	V.
29.250	1621.3579	0.60	Q	.	.	.	V.
29.333	1621.3608	0.43	Q	.	.	.	V.
29.417	1621.3627	0.27	Q	.	.	.	V.
29.500	1621.3634	0.11	Q	.	.	.	V
29.583	1621.3634	0.00	Q	.	.	.	V

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1770.0
10%	1395.0
20%	250.0
30%	155.0
40%	80.0
50%	60.0
60%	45.0
70%	40.0
80%	30.0
90%	20.0

END OF FLOODSCx ROUTING ANALYSIS

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

            F L O O D    R O U T I N G    A N A L Y S I S
         USING COUNTY HYDROLOGY MANUAL OF SAN BERNARDINO(1986)
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                        Analysis prepared by:

                            RBF Consulting
                          14257 Alton Parkway
                               Irvine, CA
                                 92618

 ************************* DESCRIPTION OF STUDY *************************
* REDLANDS MASTER PLAN OF DRAINAGE                                      *
* UNIT HYDROGRAPH MODEL - NODE 20852 - REGIONAL                         *
* BY TMULI      JN: 136769     FEBRUARY 2014                            *
 ************************************************************************

  FILE NAME: 20852.DAT
  TIME/DATE OF STUDY: 09:44 02/27/2014


**************************************************************************
  FLOW PROCESS FROM NODE  20620.00 TO NODE  20852.00 IS CODE =   1
--------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
==========================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =    2992.920 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.390 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY(DEVELOPED):
                  "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.924
         FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.000
         MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.000
         VALLEY(UNDEVELOPED)/DESERT:
                  "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.076
         DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.000
         MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) =  0.490
         LOW LOSS FRACTION = 0.510
         *HYDROGRAPH MODEL #1 SPECIFIED*

         SPECIFIED PEAK  5-MINUTES RAINFALL(INCH)=  0.42
         SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)=  0.86
         SPECIFIED PEAK  1-HOUR RAINFALL(INCH) =  1.14
         SPECIFIED PEAK  3-HOUR RAINFALL(INCH) =  1.92
         SPECIFIED PEAK  6-HOUR RAINFALL(INCH) =  2.68
         SPECIFIED PEAK 24-HOUR RAINFALL(INCH) =  5.53

         *USER SPECIFIED PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
```



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          5-MINUTE FACTOR = 0.870
         30-MINUTE FACTOR = 0.870
          1-HOUR FACTOR = 0.870
          3-HOUR FACTOR = 0.980
          6-HOUR FACTOR = 0.990
         24-HOUR FACTOR = 0.990

       UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
       UNIT INTERVAL PERCENTAGE OF LAG-TIME =  21.368
```

UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	1.290	467.078
2	5.494	1521.580
3	15.474	3612.205
4	29.085	4926.806
5	45.969	6111.062
6	63.178	6228.970
7	76.448	4803.105
8	85.119	3138.480
9	90.374	1902.073
10	93.876	1267.822
11	95.936	745.491
12	97.057	405.848
13	97.573	186.457
14	98.066	178.465
15	98.541	171.956
16	99.006	168.369
17	99.274	96.998
18	99.349	27.350
19	99.418	24.903
20	99.478	21.783
21	99.537	21.399
22	99.587	18.071
23	99.635	17.290
24	99.682	17.130
25	99.719	13.175
26	99.750	11.411
27	99.782	11.422
28	99.813	11.411
29	99.843	10.828
30	99.859	5.487
31	99.870	4.214
32	99.882	4.228
33	99.894	4.211
34	99.905	4.222
35	99.917	4.214
36	99.928	4.220
37	99.940	4.214
38	99.952	4.214
39	99.963	4.217

40	99.975	4.214
41	99.987	4.214
42	99.998	4.214
43	100.000	0.605

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 654.7987

TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 710.2791

==========

2 4 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

==========

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	800.0	1600.0	2400.0	3200.0
0.083	0.0157	2.28	Q	.	.	.	.
0.167	0.0824	9.69	Q	.	.	.	.
0.250	0.2705	27.31	Q	.	.	.	.
0.333	0.6242	51.36	Q	.	.	.	.
0.417	1.1838	81.25	VQ	.	.	.	.
0.500	1.9536	111.78	VQ	.	.	.	.
0.583	2.8865	135.45	VQ	.	.	.	.
0.667	3.9269	151.07	VQ	.	.	.	.
0.750	5.0338	160.72	V Q	.	.	.	.
0.833	6.1859	167.30	V Q	.	.	.	.
0.917	7.3661	171.35	V Q	.	.	.	.
1.000	8.5628	173.77	V Q	.	.	.	.
1.083	9.7689	175.13	V Q	.	.	.	.
1.167	10.9842	176.45	V Q	.	.	.	.
1.250	12.2083	177.75	V Q	.	.	.	.
1.333	13.4413	179.03	V Q	.	.	.	.
1.417	14.6809	179.98	V Q	.	.	.	.
1.500	15.9246	180.59	V Q	.	.	.	.
1.583	17.1725	181.19	V Q	.	.	.	.
1.667	18.4244	181.78	.VQ	.	.	.	.
1.750	19.6805	182.38	.VQ	.	.	.	.
1.833	20.9405	182.96	.VQ	.	.	.	.
1.917	22.2046	183.54	.VQ	.	.	.	.
2.000	23.4727	184.13	.VQ	.	.	.	.
2.083	24.7448	184.70	.VQ	.	.	.	.
2.167	26.0208	185.27	.VQ	.	.	.	.
2.250	27.3007	185.85	.VQ	.	.	.	.
2.333	28.5846	186.42	.VQ	.	.	.	.
2.417	29.8725	187.00	.VQ	.	.	.	.
2.500	31.1642	187.56	.VQ	.	.	.	.
2.583	32.4598	188.12	.VQ	.	.	.	.
2.667	33.7592	188.68	.VQ	.	.	.	.
2.750	35.0625	189.24	.VQ	.	.	.	.
2.833	36.3698	189.81	. Q	.	.	.	.
2.917	37.6810	190.39	. Q	.	.	.	.
3.000	38.9963	190.97	. Q	.	.	.	.
3.083	40.3156	191.56	. Q	.	.	.	.
3.167	41.6389	192.15	. Q	.	.	.	.
3.250	42.9664	192.75	. Q	.	.	.	.
3.333	44.2980	193.35	. Q	.	.	.	.
3.417	45.6338	193.96	. Q	.	.	.	.
3.500	46.9738	194.57	. Q	.	.	.	.
3.583	48.3180	195.17	. Q	.	.	.	.
3.667	49.6663	195.78	. Q	.	.	.	.
3.750	51.0189	196.39	. Q	.	.	.	.
3.833	52.3756	197.00	. Q	.	.	.	.
3.917	53.7367	197.63	. QV	.	.	.	.

4.000	55.1021	198.25	. QV	.	.	.	.	
4.083	56.4718	198.89	. QV	.	.	.	.	
4.167	57.8460	199.53	. QV	.	.	.	.	
4.250	59.2247	200.18	. QV	.	.	.	.	
4.333	60.6078	200.83	. QV	.	.	.	.	
4.417	61.9955	201.49	. QV	.	.	.	.	
4.500	63.3878	202.16	. QV	.	.	.	.	
4.583	64.7847	202.84	. QV	.	.	.	.	
4.667	66.1863	203.52	. QV	.	.	.	.	
4.750	67.5927	204.21	. QV	.	.	.	.	
4.833	69.0039	204.90	. QV	.	.	.	.	
4.917	70.4199	205.60	. QV	.	.	.	.	
5.000	71.8408	206.31	. Q V	.	.	.	.	
5.083	73.2666	207.03	. Q V	.	.	.	.	
5.167	74.6975	207.76	. Q V	.	.	.	.	
5.250	76.1334	208.49	. Q V	.	.	.	.	
5.333	77.5744	209.24	. Q V	.	.	.	.	
5.417	79.0206	209.99	. Q V	.	.	.	.	
5.500	80.4720	210.74	. Q V	.	.	.	.	
5.583	81.9287	211.51	. Q V	.	.	.	.	
5.667	83.3908	212.29	. Q V	.	.	.	.	
5.750	84.8582	213.07	. Q V	.	.	.	.	
5.833	86.3311	213.87	. Q V	.	.	.	.	
5.917	87.8096	214.67	. Q V	.	.	.	.	
6.000	89.2936	215.48	. Q V	.	.	.	.	
6.083	90.7833	216.31	. Q V	.	.	.	.	
6.167	92.2788	217.14	. Q V	.	.	.	.	
6.250	93.7800	217.98	. Q V	.	.	.	.	
6.333	95.2871	218.83	. Q V	.	.	.	.	
6.417	96.8001	219.69	. Q V	.	.	.	.	
6.500	98.3192	220.56	. Q V	.	.	.	.	
6.583	99.8443	221.45	. Q V	.	.	.	.	
6.667	101.3756	222.34	. Q V	.	.	.	.	
6.750	102.9132	223.25	. Q V	.	.	.	.	
6.833	104.4570	224.17	. Q V	.	.	.	.	
6.917	106.0073	225.10	. Q V	.	.	.	.	
7.000	107.5641	226.04	. Q V	.	.	.	.	
7.083	109.1274	227.00	. Q V	.	.	.	.	
7.167	110.6974	227.96	. Q V	.	.	.	.	
7.250	112.2742	228.94	. Q V	.	.	.	.	
7.333	113.8577	229.94	. Q V	.	.	.	.	
7.417	115.4483	230.94	. Q V	.	.	.	.	
7.500	117.0458	231.96	. Q V	.	.	.	.	
7.583	118.6505	233.00	. Q V	.	.	.	.	
7.667	120.2623	234.04	. Q V	.	.	.	.	
7.750	121.8815	235.11	. Q V	.	.	.	.	
7.833	123.5081	236.18	. Q V	.	.	.	.	
7.917	125.1423	237.28	. Q V	.	.	.	.	
8.000	126.7841	238.39	. Q V	.	.	.	.	
8.083	128.4337	239.52	. Q V	.	.	.	.	
8.167	130.0911	240.66	. Q V	.	.	.	.	
8.250	131.7565	241.82	. Q V	.	.	.	.	
8.333	133.4300	242.99	. Q V	.	.	.	.	
8.417	135.1118	244.19	. Q V	.	.	.	.	
8.500	136.8019	245.40	. Q V	.	.	.	.	
8.583	138.5005	246.64	. Q V	.	.	.	.	
8.667	140.2077	247.88	. Q V	.	.	.	.	
8.750	141.9236	249.16	. Q V	.	.	.	.	

8.833	143.6485	250.45	. Q V	.	.	.	.	
8.917	145.3824	251.76	. Q V	.	.	.	.	
9.000	147.1255	253.09	. Q V	.	.	.	.	
9.083	148.8779	254.46	. Q V	.	.	.	.	
9.167	150.6398	255.83	. Q V	.	.	.	.	
9.250	152.4114	257.24	. Q V	.	.	.	.	
9.333	154.1928	258.66	. Q V	.	.	.	.	
9.417	155.9843	260.12	. Q V	.	.	.	.	
9.500	157.7858	261.59	. Q V	.	.	.	.	
9.583	159.5978	263.10	. Q V	.	.	.	.	
9.667	161.4203	264.62	. Q V	.	.	.	.	
9.750	163.2535	266.19	. Q V	.	.	.	.	
9.833	165.0977	267.77	. Q V	.	.	.	.	
9.917	166.9530	269.39	. Q V	.	.	.	.	
10.000	168.8197	271.04	. Q V	.	.	.	.	
10.083	170.6979	272.72	. Q V	.	.	.	.	
10.167	172.5879	274.43	. Q V	.	.	.	.	
10.250	174.4899	276.18	. Q V	.	.	.	.	
10.333	176.4042	277.95	. Q V	.	.	.	.	
10.417	178.3311	279.78	. Q V	.	.	.	.	
10.500	180.2706	281.63	. Q V	.	.	.	.	
10.583	182.2233	283.52	. Q V	.	.	.	.	
10.667	184.1892	285.45	. Q V	.	.	.	.	
10.750	186.1687	287.43	. Q V	.	.	.	.	
10.833	188.1621	289.44	. Q V	.	.	.	.	
10.917	190.1698	291.51	. Q V	.	.	.	.	
11.000	192.1919	293.61	. Q V	.	.	.	.	
11.083	194.2289	295.77	. Q V	.	.	.	.	
11.167	196.2810	297.97	. Q V	.	.	.	.	
11.250	198.3488	300.23	. Q V	.	.	.	.	
11.333	200.4324	302.54	. Q V	.	.	.	.	
11.417	202.5323	304.91	. Q V	.	.	.	.	
11.500	204.6489	307.33	. Q V	.	.	.	.	
11.583	206.7827	309.82	. Q V	.	.	.	.	
11.667	208.9340	312.37	. Q V	.	.	.	.	
11.750	211.1033	314.99	. Q V	.	.	.	.	
11.833	213.2911	317.67	. Q V	.	.	.	.	
11.917	215.4980	320.43	. Q V	.	.	.	.	
12.000	217.7243	323.26	. Q V	.	.	.	.	
12.083	219.9692	325.96	. Q V	.	.	.	.	
12.167	222.2295	328.21	. Q V	.	.	.	.	
12.250	224.4992	329.56	. Q V	.	.	.	.	
12.333	226.7743	330.34	. Q V	.	.	.	.	
12.417	229.0517	330.67	. Q V	.	.	.	.	
12.500	231.3315	331.03	. Q V	.	.	.	.	
12.583	233.6194	332.21	. Q V	.	.	.	.	
12.667	235.9216	334.28	. Q V	.	.	.	.	
12.750	238.2432	337.09	. Q V	.	.	.	.	
12.833	240.5870	340.32	. Q V	.	.	.	.	
12.917	242.9558	343.96	. Q V	.	.	.	.	
13.000	245.3517	347.88	. Q V	.	.	.	.	
13.083	247.7765	352.08	. Q V	.	.	.	.	
13.167	250.2312	356.42	. Q V	.	.	.	.	
13.250	252.7172	360.97	. Q V	.	.	.	.	
13.333	255.2356	365.67	. Q V	.	.	.	.	
13.417	257.7881	370.64	. Q V	.	.	.	.	
13.500	260.3764	375.81	. Q V	.	.	.	.	
13.583	263.0021	381.25	. Q V	.	.	.	.	

13.667	265.6667	386.90	. Q . V . . .
13.750	268.3722	392.84	. Q . V . . .
13.833	271.1204	399.03	. Q . V . . .
13.917	273.9136	405.57	. Q . V . . .
14.000	276.7538	412.40	. Q . V . . .
14.083	279.6510	420.67	. Q . V . . .
14.167	282.6237	431.64	. Q . V . . .
14.250	285.7073	447.74	. Q . V . . .
14.333	288.9246	467.15	. Q . V . . .
14.417	292.2974	489.74	. Q . V . . .
14.500	295.8307	513.03	. Q . V . . .
14.583	299.5069	533.78	. Q . V . . .
14.667	303.3042	551.37	. Q . V . . .
14.750	307.2091	567.00	. Q . V . . .
14.833	311.2170	581.95	. Q . V . . .
14.917	315.3269	596.75	. Q . V . . .
15.000	319.5401	611.76	. Q . V . . .
15.083	323.8625	627.62	. Q . V . . .
15.167	328.3030	644.76	. Q . V . . .
15.250	332.8741	663.71	. Q . V . . .
15.333	337.5880	684.47	. Q . V. . .
15.417	342.4388	704.34	. Q . V. . .
15.500	347.3922	719.23	. Q . V. . .
15.583	352.3730	723.23	. Q. V. . .
15.667	357.3482	722.40	. Q. V . . .
15.750	362.3087	720.26	. Q. V . . .
15.833	367.3099	726.16	. Q. V . . .
15.917	372.5452	760.17	. Q. V . . .
16.000	378.3637	844.85	. Q .V . . .
16.083	386.0790	1120.27	. . Q .V . . .
16.167	397.1543	1608.13	. . Q V . . .
16.250	413.3730	2354.96	. . . V Q. . .
16.333	432.8896	2833.81	. . . V . Q .
16.417	454.7298	3171.20	. . . V . Q.
16.500	476.0444	3094.88	. . . V . Q .
16.583	493.5421	2540.68	. . . V .Q . .
16.667	506.8140	1927.07	. . . Q V . . .
16.750	516.9502	1471.78	. . Q . V. . .
16.833	525.2972	1211.99	. . Q . V. . .
16.917	532.1834	999.87	. . Q . V. . .
17.000	538.0385	850.15	. Q . V . . .
17.083	543.1799	746.55	. Q. . V . . .
17.167	548.0519	707.41	. Q . . V . . .
17.250	552.6485	667.42	. Q . . .V . . .
17.333	556.9522	624.90	. Q . . .V . . .
17.417	560.8289	562.89	. Q . . .V . . .
17.500	564.3182	506.64	. Q . . .V . . .
17.583	567.5958	475.91	. Q . . .V . . .
17.667	570.7054	451.52	. Q . . . V . . .
17.750	573.6813	432.09	. Q . . . V . . .
17.833	576.5356	414.46	. Q . . . V . . .
17.917	579.2905	400.00	. Q . . . V . . .
18.000	581.9588	387.44	. Q . . . V . . .
18.083	584.5452	375.55	. Q . . . V . . .
18.167	587.0637	365.68	. Q . . . . V . .
18.250	589.5298	358.07	. Q . . . . V . .
18.333	591.9517	351.66	. Q . . . . V . .
18.417	594.3358	346.18	. Q . . . . V . .

18.500	596.6789	340.21	. Q . . . V .
18.583	598.9877	335.25	. Q . . . V .
18.667	601.2626	330.31	. Q . . . V .
18.750	603.5020	325.16	. Q . . . V .
18.833	605.7059	320.02	. Q . . . V .
18.917	607.8749	314.94	. Q . . . V .
19.000	610.0098	309.98	. Q . . . V .
19.083	612.1116	305.17	. Q . . . V .
19.167	614.1817	300.59	. Q . . . V .
19.250	616.2216	296.20	. Q . . . V .
19.333	618.2325	291.99	. Q . . . V .
19.417	620.2151	287.87	. Q . . . V .
19.500	622.1696	283.78	. Q . . . V .
19.583	624.0905	278.93	. Q . . . V .
19.667	625.9853	275.12	. Q . . . V .
19.750	627.8562	271.66	. Q . . . V .
19.833	629.7043	268.35	. Q . . . V .
19.917	631.5305	265.15	. Q . . . V .
20.000	633.3353	262.07	. Q . . . V .
20.083	635.1197	259.09	. Q . . . V .
20.167	636.8843	256.22	. Q . . . V .
20.250	638.6298	253.45	. Q . . . V .
20.333	640.3568	250.77	. Q . . . V .
20.417	642.0660	248.17	. Q . . . V .
20.500	643.7579	245.66	. Q . . . V .
20.583	645.4330	243.23	. Q . . . V .
20.667	647.0920	240.88	. Q . . . V .
20.750	648.7352	238.59	. Q . . . V .
20.833	650.3631	236.38	. Q . . . V .
20.917	651.9762	234.22	. Q . . . V .
21.000	653.5749	232.13	. Q . . . V .
21.083	655.1595	230.09	. Q . . . V .
21.167	656.7306	228.11	. Q . . . V .
21.250	658.2883	226.18	. Q . . . V .
21.333	659.8331	224.31	. Q . . . V .
21.417	661.3653	222.47	. Q . . . V .
21.500	662.8852	220.69	. Q . . . V .
21.583	664.3931	218.94	. Q . . . V .
21.667	665.8892	217.24	. Q . . . V .
21.750	667.3740	215.58	. Q . . . V .
21.833	668.8475	213.96	. Q . . . V .
21.917	670.3102	212.37	. Q . . . V .
22.000	671.7621	210.83	. Q . . . V .
22.083	673.2037	209.31	. Q . . . V .
22.167	674.6350	207.83	. Q . . . V .
22.250	676.0564	206.38	. Q . . . V .
22.333	677.4680	204.97	. Q . . . V .
22.417	678.8701	203.58	. Q . . . V .
22.500	680.2628	202.22	. Q . . . V .
22.583	681.6463	200.89	. Q . . . V .
22.667	683.0208	199.58	. Q . . . V .
22.750	684.3865	198.30	. Q . . . V .
22.833	685.7437	197.05	. Q . . . V .
22.917	687.0923	195.82	. Q . . . V .
23.000	688.4326	194.61	. Q . . . V .
23.083	689.7648	193.43	. Q . . . V .
23.167	691.0889	192.27	. Q . . . V .
23.250	692.4053	191.13	. Q . . . V .

23.333	693.7139	190.01	. Q	.	.	.	V.
23.417	695.0149	188.91	. Q	.	.	.	V.
23.500	696.3085	187.83	. Q	.	.	.	V.
23.583	697.5948	186.77	. Q	.	.	.	V.
23.667	698.8740	185.73	. Q	.	.	.	V.
23.750	700.1461	184.71	. Q	.	.	.	V.
23.833	701.4113	183.70	. Q	.	.	.	V.
23.917	702.6697	182.71	. Q	.	.	.	V.
24.000	703.9213	181.74	. Q	.	.	.	V.
24.083	705.1507	178.51	. Q	.	.	.	V.
24.167	706.3227	170.18	. Q	.	.	.	V.
24.250	707.3677	151.73	.Q	.	.	.	V.
24.333	708.2422	126.99	.Q	.	.	.	V.
24.417	708.9077	96.62	.Q	.	.	.	V.
24.500	709.3611	65.84	Q	.	.	.	V.
24.583	709.6514	42.15	Q	.	.	.	V.
24.667	709.8351	26.67	Q	.	.	.	V.
24.750	709.9541	17.28	Q	.	.	.	V.
24.833	710.0300	11.03	Q	.	.	.	V.
24.917	710.0806	7.34	Q	.	.	.	V.
25.000	710.1174	5.33	Q	.	.	.	V.
25.083	710.1476	4.40	Q	.	.	.	V.
25.167	710.1718	3.51	Q	.	.	.	V.
25.250	710.1901	2.65	Q	.	.	.	V.
25.333	710.2026	1.82	Q	.	.	.	V.
25.417	710.2118	1.34	Q	.	.	.	V.
25.500	710.2200	1.20	Q	.	.	.	V.
25.583	710.2274	1.07	Q	.	.	.	V.
25.667	710.2340	0.96	Q	.	.	.	V.
25.750	710.2399	0.85	Q	.	.	.	V.
25.833	710.2451	0.76	Q	.	.	.	V.
25.917	710.2496	0.67	Q	.	.	.	V.
26.000	710.2537	0.58	Q	.	.	.	V.
26.083	710.2572	0.51	Q	.	.	.	V.
26.167	710.2603	0.46	Q	.	.	.	V.
26.250	710.2631	0.40	Q	.	.	.	V.
26.333	710.2654	0.34	Q	.	.	.	V.
26.417	710.2673	0.29	Q	.	.	.	V.
26.500	710.2691	0.26	Q	.	.	.	V.
26.583	710.2708	0.24	Q	.	.	.	V.
26.667	710.2722	0.21	Q	.	.	.	V.
26.750	710.2736	0.19	Q	.	.	.	V.
26.833	710.2747	0.17	Q	.	.	.	V.
26.917	710.2758	0.15	Q	.	.	.	V.
27.000	710.2766	0.13	Q	.	.	.	V.
27.083	710.2773	0.11	Q	.	.	.	V.
27.167	710.2780	0.09	Q	.	.	.	V.
27.250	710.2784	0.07	Q	.	.	.	V.
27.333	710.2787	0.04	Q	.	.	.	V.
27.417	710.2789	0.02	Q	.	.	.	V.
27.500	710.2789	0.00	Q	.	.	.	V.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1650.0
10%	425.0
20%	130.0
30%	55.0
40%	40.0
50%	35.0
60%	30.0
70%	25.0
80%	20.0
90%	10.0

END OF FLOODSCx ROUTING ANALYSIS

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

            F L O O D    R O U T I N G    A N A L Y S I S
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                        Analysis prepared by:

                           RBF Consulting
                         14257 Alton Parkway
                              Irvine, CA
                                92618

 ************************* DESCRIPTION OF STUDY *************************
* REDLANDS MASTER PLAN OF DRAINAGE                                      *
* UNIT HYDROGRAPH MODEL - NODE 20939(D/S AREA ADDED AT THIS NODE)       *
* BY TMULI   JN: 136769  FEBRUARY 2014                                  *
 ************************************************************************

  FILE NAME: 20939.DAT
  TIME/DATE OF STUDY: 10:32 02/27/2014


**************************************************************************
  FLOW PROCESS FROM NODE  20910.00 TO NODE  20939.00 IS CODE =   1
--------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
==========================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =    1000.840 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.370 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY(DEVELOPED):
                  "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.833
         FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.000
         MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.000
         VALLEY(UNDEVELOPED)/DESERT:
                  "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.167
         DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.000
         MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) =  0.460
         LOW LOSS FRACTION = 0.490
         *HYDROGRAPH MODEL #1 SPECIFIED*

         SPECIFIED PEAK  5-MINUTES RAINFALL(INCH)=  0.46
         SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)=  0.95
         SPECIFIED PEAK  1-HOUR RAINFALL(INCH) =  1.25
         SPECIFIED PEAK  3-HOUR RAINFALL(INCH) =  2.03
         SPECIFIED PEAK  6-HOUR RAINFALL(INCH) =  2.75
         SPECIFIED PEAK 24-HOUR RAINFALL(INCH) =  5.50

         *USER SPECIFIED PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
```



```
          5-MINUTE FACTOR = 0.960
         30-MINUTE FACTOR = 0.960
          1-HOUR FACTOR = 0.960
          3-HOUR FACTOR = 0.990
          6-HOUR FACTOR = 1.000
         24-HOUR FACTOR = 1.000

       UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
       UNIT INTERVAL PERCENTAGE OF LAG-TIME =  22.523
```

UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	1.434	173.588
2	6.312	590.380
3	17.377	1339.380
4	32.192	1793.192
5	50.334	2195.884
6	67.126	2032.401
7	78.731	1404.719
8	86.128	895.335
9	90.658	548.304
10	93.542	349.076
11	95.289	211.426
12	96.099	98.051
13	96.751	78.974
14	97.360	73.686
15	97.933	69.346
16	98.376	53.621
17	98.552	21.321
18	98.714	19.573
19	98.854	16.905
20	98.990	16.486
21	99.105	13.889
22	99.215	13.390
23	99.322	12.939
24	99.401	9.543
25	99.474	8.838
26	99.547	8.841
27	99.620	8.842
28	99.676	6.720
29	99.703	3.313
30	99.730	3.271
31	99.757	3.263
32	99.784	3.268
33	99.811	3.271
34	99.838	3.267
35	99.865	3.267
36	99.892	3.267
37	99.919	3.267
38	99.946	3.268
39	99.973	3.267

40	100.000	3.267
41	100.000	0.002

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 205.9305
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 252.6571

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2 4 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

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HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	375.0	750.0	1125.0	1500.0
0.083	0.0058	0.85	Q	.	.	.	.
0.167	0.0315	3.73	Q	.	.	.	.
0.250	0.1022	10.26	Q	.	.	.	.
0.333	0.2332	19.02	Q	.	.	.	.
0.417	0.4382	29.77	Q	.	.	.	.
0.500	0.7120	39.75	VQ	.	.	.	.
0.583	1.0336	46.70	VQ	.	.	.	.
0.667	1.3861	51.19	VQ	.	.	.	.
0.750	1.7580	53.99	VQ	.	.	.	.
0.833	2.1425	55.84	VQ	.	.	.	.
0.917	2.5352	57.02	VQ	.	.	.	.
1.000	2.9323	57.65	VQ	.	.	.	.
1.083	3.3330	58.19	VQ	.	.	.	.
1.167	3.7373	58.71	VQ	.	.	.	.
1.250	4.1451	59.21	VQ	.	.	.	.
1.333	4.5557	59.63	VQ	.	.	.	.
1.417	4.9683	59.90	VQ	.	.	.	.
1.500	5.3826	60.16	VQ	.	.	.	.
1.583	5.7986	60.41	VQ	.	.	.	.
1.667	6.2164	60.66	VQ	.	.	.	.
1.750	6.6358	60.90	.Q	.	.	.	.
1.833	7.0569	61.14	.Q	.	.	.	.
1.917	7.4796	61.38	.Q	.	.	.	.
2.000	7.9038	61.60	.Q	.	.	.	.
2.083	8.3295	61.82	.Q	.	.	.	.
2.167	8.7568	62.04	.Q	.	.	.	.
2.250	9.1857	62.27	.Q	.	.	.	.
2.333	9.6160	62.48	.Q	.	.	.	.
2.417	10.0477	62.69	.Q	.	.	.	.
2.500	10.4808	62.89	.Q	.	.	.	.
2.583	10.9153	63.09	.Q	.	.	.	.
2.667	11.3513	63.30	.Q	.	.	.	.
2.750	11.7886	63.51	.Q	.	.	.	.
2.833	12.2274	63.71	.Q	.	.	.	.
2.917	12.6677	63.93	.QV	.	.	.	.
3.000	13.1094	64.14	.QV	.	.	.	.
3.083	13.5527	64.36	.QV	.	.	.	.
3.167	13.9974	64.57	.QV	.	.	.	.
3.250	14.4436	64.79	.QV	.	.	.	.
3.333	14.8913	65.01	.QV	.	.	.	.
3.417	15.3405	65.22	.QV	.	.	.	.
3.500	15.7911	65.43	.QV	.	.	.	.
3.583	16.2432	65.64	.QV	.	.	.	.
3.667	16.6967	65.85	.QV	.	.	.	.
3.750	17.1517	66.07	.QV	.	.	.	.
3.833	17.6082	66.28	.QV	.	.	.	.
3.917	18.0662	66.50	.QV	.	.	.	.

4.000	18.5257	66.72	.QV	.	.	.	.
4.083	18.9868	66.95	.Q V	.	.	.	.
4.167	19.4495	67.18	.Q V	.	.	.	.
4.250	19.9137	67.40	.Q V	.	.	.	.
4.333	20.3795	67.63	.Q V	.	.	.	.
4.417	20.8469	67.87	.Q V	.	.	.	.
4.500	21.3159	68.10	.Q V	.	.	.	.
4.583	21.7866	68.34	.Q V	.	.	.	.
4.667	22.2589	68.58	.Q V	.	.	.	.
4.750	22.7329	68.83	.Q V	.	.	.	.
4.833	23.2086	69.07	.Q V	.	.	.	.
4.917	23.6860	69.32	.Q V	.	.	.	.
5.000	24.1652	69.57	.Q V	.	.	.	.
5.083	24.6460	69.82	.Q V	.	.	.	.
5.167	25.1287	70.08	.Q V	.	.	.	.
5.250	25.6131	70.34	.Q V	.	.	.	.
5.333	26.0994	70.60	.Q V	.	.	.	.
5.417	26.5874	70.87	.Q V	.	.	.	.
5.500	27.0774	71.14	.Q V	.	.	.	.
5.583	27.5692	71.41	.Q V	.	.	.	.
5.667	28.0628	71.68	.Q V	.	.	.	.
5.750	28.5585	71.96	.Q V	.	.	.	.
5.833	29.0560	72.24	.Q V	.	.	.	.
5.917	29.5555	72.53	.Q V	.	.	.	.
6.000	30.0569	72.81	.Q V	.	.	.	.
6.083	30.5604	73.11	.Q V	.	.	.	.
6.167	31.0659	73.40	.Q V	.	.	.	.
6.250	31.5735	73.70	.Q V	.	.	.	.
6.333	32.0831	74.00	.Q V	.	.	.	.
6.417	32.5949	74.31	.Q V	.	.	.	.
6.500	33.1088	74.62	.Q V	.	.	.	.
6.583	33.6248	74.93	.Q V	.	.	.	.
6.667	34.1430	75.25	. Q V	.	.	.	.
6.750	34.6635	75.57	. Q V	.	.	.	.
6.833	35.1862	75.89	. Q V	.	.	.	.
6.917	35.7111	76.22	. Q V	.	.	.	.
7.000	36.2384	76.56	. Q V	.	.	.	.
7.083	36.7680	76.90	. Q V	.	.	.	.
7.167	37.2999	77.24	. Q V	.	.	.	.
7.250	37.8343	77.59	. Q V	.	.	.	.
7.333	38.3711	77.94	. Q V	.	.	.	.
7.417	38.9103	78.30	. Q V	.	.	.	.
7.500	39.4521	78.66	. Q V	.	.	.	.
7.583	39.9963	79.03	. Q V	.	.	.	.
7.667	40.5432	79.40	. Q V	.	.	.	.
7.750	41.0926	79.78	. Q V	.	.	.	.
7.833	41.6447	80.16	. Q V	.	.	.	.
7.917	42.1995	80.55	. Q V	.	.	.	.
8.000	42.7570	80.95	. Q V	.	.	.	.
8.083	43.3172	81.35	. Q V	.	.	.	.
8.167	43.8803	81.75	. Q V	.	.	.	.
8.250	44.4462	82.17	. Q V	.	.	.	.
8.333	45.0149	82.59	. Q V	.	.	.	.
8.417	45.5867	83.01	. Q V	.	.	.	.
8.500	46.1613	83.44	. Q V	.	.	.	.
8.583	46.7391	83.89	. Q V	.	.	.	.
8.667	47.3198	84.33	. Q V	.	.	.	.
8.750	47.9038	84.79	. Q V	.	.	.	.

8.833	48.4909	85.24	. Q V	.	.	.	.
8.917	49.0812	85.71	. Q V	.	.	.	.
9.000	49.6748	86.19	. Q V	.	.	.	.
9.083	50.2717	86.68	. Q V	.	.	.	.
9.167	50.8720	87.17	. Q V	.	.	.	.
9.250	51.4758	87.67	. Q V	.	.	.	.
9.333	52.0831	88.18	. Q V	.	.	.	.
9.417	52.6940	88.70	. Q V	.	.	.	.
9.500	53.3085	89.22	. Q V	.	.	.	.
9.583	53.9267	89.77	. Q V	.	.	.	.
9.667	54.5487	90.31	. Q V	.	.	.	.
9.750	55.1745	90.87	. Q V	.	.	.	.
9.833	55.8042	91.44	. Q V	.	.	.	.
9.917	56.4380	92.02	. Q V	.	.	.	.
10.000	57.0758	92.61	. Q V.	.	.	.	.
10.083	57.7177	93.21	. Q V.	.	.	.	.
10.167	58.3639	93.82	. Q V.	.	.	.	.
10.250	59.0144	94.45	. Q V.	.	.	.	.
10.333	59.6692	95.09	. Q V.	.	.	.	.
10.417	60.3286	95.74	. Q V.	.	.	.	.
10.500	60.9926	96.41	. Q V.	.	.	.	.
10.583	61.6612	97.09	. Q V.	.	.	.	.
10.667	62.3346	97.78	. Q V.	.	.	.	.
10.750	63.0129	98.49	. Q V.	.	.	.	.
10.833	63.6962	99.21	. Q V	.	.	.	.
10.917	64.3846	99.96	. Q V	.	.	.	.
11.000	65.0783	100.71	. Q V	.	.	.	.
11.083	65.7772	101.49	. Q V	.	.	.	.
11.167	66.4817	102.28	. Q V	.	.	.	.
11.250	67.1917	103.10	. Q V	.	.	.	.
11.333	67.9075	103.93	. Q V	.	.	.	.
11.417	68.6292	104.79	. Q V	.	.	.	.
11.500	69.3568	105.66	. Q V	.	.	.	.
11.583	70.0907	106.56	. Q .V	.	.	.	.
11.667	70.8309	107.48	. Q .V	.	.	.	.
11.750	71.5776	108.42	. Q .V	.	.	.	.
11.833	72.3310	109.39	. Q .V	.	.	.	.
11.917	73.0913	110.39	. Q .V	.	.	.	.
12.000	73.8586	111.41	. Q .V	.	.	.	.
12.083	74.6321	112.31	. Q .V	.	.	.	.
12.167	75.4092	112.84	. Q .V	.	.	.	.
12.250	76.1856	112.72	. Q . V	.	.	.	.
12.333	76.9583	112.21	. Q . V	.	.	.	.
12.417	77.7253	111.36	. Q . V	.	.	.	.
12.500	78.4876	110.69	. Q . V	.	.	.	.
12.583	79.2496	110.65	. Q . V	.	.	.	.
12.667	80.0149	111.11	. Q . V	.	.	.	.
12.750	80.7859	111.95	. Q . V	.	.	.	.
12.833	81.5642	113.01	. Q . V	.	.	.	.
12.917	82.3512	114.26	. Q . V	.	.	.	.
13.000	83.1477	115.66	. Q . V	.	.	.	.
13.083	83.9544	117.14	. Q . V	.	.	.	.
13.167	84.7717	118.67	. Q . V	.	.	.	.
13.250	85.6002	120.29	. Q . V	.	.	.	.
13.333	86.4402	121.97	. Q . V	.	.	.	.
13.417	87.2927	123.78	. Q . V	.	.	.	.
13.500	88.1581	125.65	. Q . V	.	.	.	.
13.583	89.0370	127.62	. Q . V	.	.	.	.

13.667	89.9301	129.67	. Q . V . . .
13.750	90.8380	131.84	. Q . V . . .
13.833	91.7615	134.09	. Q . V . . .
13.917	92.7015	136.49	. Q . V . . .
14.000	93.6587	138.99	. Q . V . . .
14.083	94.6348	141.73	. Q . V . . .
14.167	95.6321	144.80	. Q . V . . .
14.250	96.6543	148.43	. Q . V . . .
14.333	97.7041	152.43	. Q . V . . .
14.417	98.7844	156.86	. Q . V . . .
14.500	99.8960	161.40	. Q . V . . .
14.583	101.0388	165.93	. Q . V . . .
14.667	102.2127	170.45	. Q . V . . .
14.750	103.4191	175.17	. Q . V . . .
14.833	104.6594	180.09	. Q . V . . .
14.917	105.9363	185.41	. Q . V . . .
15.000	107.2522	191.07	. Q . V . . .
15.083	108.6113	197.34	. Q . V . . .
15.167	110.0173	204.15	. Q . V . . .
15.250	111.4760	211.80	. Q . V . . .
15.333	112.9928	220.25	. Q . V . . .
15.417	114.5715	229.23	. Q . V . . .
15.500	116.2098	237.88	. Q . V . . .
15.583	117.9011	245.57	. Q . V . . .
15.667	119.6476	253.59	. Q . V . . .
15.750	121.4624	263.51	. Q . V. . .
15.833	123.3803	278.48	. Q . V. . .
15.917	125.4915	306.54	. Q . V. . .
16.000	127.9632	358.89	. Q. V . .
16.083	131.4233	502.41	. . Q V . .
16.167	136.5755	748.09	. . Q.V . .
16.250	144.0688	1088.04	. . . V Q. .
16.333	152.9663	1291.92	. . . V . Q .
16.417	162.6707	1409.07	. . . V . Q .
16.500	171.4771	1278.70	. . . V . Q .
16.583	178.2023	976.50	. . . Q V . .
16.667	183.1824	723.10	. . Q. V. .
16.750	186.9297	544.11	. . Q . V. .
16.833	189.8882	429.58	. .Q . V .
16.917	192.2741	346.43	. Q. . V .
17.000	194.2196	282.48	. Q . . V .
17.083	195.9886	256.87	. Q . . .V .
17.167	197.6384	239.55	. Q . . .V .
17.250	199.1759	223.25	. Q . . .V .
17.333	200.5793	203.77	. Q . . .V .
17.417	201.8276	181.26	. Q . . .V .
17.500	203.0052	170.99	. Q . . . V .
17.583	204.1224	162.21	. Q . . . V .
17.667	205.1915	155.24	. Q . . . V .
17.750	206.2134	148.39	. Q . . . V .
17.833	207.1973	142.86	. Q . . . V .
17.917	208.1461	137.77	. Q . . . V .
18.000	209.0570	132.26	. Q . . . . V .
18.083	209.9401	128.22	. Q . . . . V .
18.167	210.8017	125.11	. Q . . . . V .
18.250	211.6473	122.79	. Q . . . . V .
18.333	212.4761	120.35	. Q . . . . V .
18.417	213.2904	118.23	. Q . . . . V .

18.500	214.0988	117.38	. Q . . . V .
18.583	214.8989	116.18	. Q . . . V .
18.667	215.6886	114.67	. Q . . . V .
18.750	216.4667	112.97	. Q . . . V .
18.833	217.2326	111.22	. Q . . . V .
18.917	217.9863	109.43	. Q . . . V .
19.000	218.7276	107.64	. Q . . . V .
19.083	219.4570	105.91	. Q . . . V .
19.167	220.1749	104.24	. Q . . . V .
19.250	220.8812	102.55	. Q . . . V .
19.333	221.5754	100.79	. Q . . . V .
19.417	222.2509	98.09	. Q . . . V .
19.500	222.9164	96.62	. Q . . . V .
19.583	223.5724	95.26	. Q . . . V .
19.667	224.2196	93.97	. Q . . . V .
19.750	224.8582	92.73	. Q . . . V .
19.833	225.4886	91.54	. Q . . . V .
19.917	226.1112	90.39	. Q . . . V .
20.000	226.7261	89.29	. Q . . . V .
20.083	227.3338	88.23	. Q . . . V .
20.167	227.9345	87.21	. Q . . . V .
20.250	228.5283	86.23	. Q . . . V .
20.333	229.1156	85.28	. Q . . . V .
20.417	229.6966	84.36	. Q . . . V .
20.500	230.2714	83.46	. Q . . . V .
20.583	230.8403	82.60	. Q . . . V .
20.667	231.4034	81.76	. Q . . . V .
20.750	231.9610	80.95	. Q . . . V .
20.833	232.5131	80.17	. Q . . . V .
20.917	233.0599	79.40	. Q . . . V .
21.000	233.6017	78.66	. Q . . . V .
21.083	234.1384	77.94	. Q . . . V .
21.167	234.6704	77.24	. Q . . . V .
21.250	235.1976	76.56	. Q . . . V .
21.333	235.7203	75.89	. Q . . . V .
21.417	236.2385	75.24	. Q . . . V .
21.500	236.7524	74.61	.Q . . . V .
21.583	237.2619	73.99	.Q . . . V .
21.667	237.7674	73.39	.Q . . . V .
21.750	238.2688	72.80	.Q . . . V .
21.833	238.7662	72.23	.Q . . . V .
21.917	239.2598	71.67	.Q . . . V .
22.000	239.7496	71.12	.Q . . . V .
22.083	240.2357	70.59	.Q . . . V .
22.167	240.7182	70.06	.Q . . . V .
22.250	241.1973	69.55	.Q . . . V .
22.333	241.6728	69.05	.Q . . . V .
22.417	242.1450	68.56	.Q . . . V .
22.500	242.6139	68.08	.Q . . . V .
22.583	243.0795	67.61	.Q . . . V .
22.667	243.5420	67.15	.Q . . . V .
22.750	244.0014	66.70	.Q . . . V .
22.833	244.4577	66.26	.Q . . . V .
22.917	244.9111	65.83	.Q . . . V .
23.000	245.3615	65.40	.Q . . . V .
23.083	245.8091	64.99	.Q . . . V .
23.167	246.2538	64.58	.Q . . . V .
23.250	246.6958	64.18	.Q . . . V.

23.333	247.1351	63.78	.Q	.	.	.	V.
23.417	247.5717	63.40	.Q	.	.	.	V.
23.500	248.0057	63.02	.Q	.	.	.	V.
23.583	248.4372	62.65	.Q	.	.	.	V.
23.667	248.8661	62.28	.Q	.	.	.	V.
23.750	249.2926	61.92	.Q	.	.	.	V.
23.833	249.7166	61.57	.Q	.	.	.	V.
23.917	250.1382	61.22	.Q	.	.	.	V.
24.000	250.5575	60.88	.Q	.	.	.	V.
24.083	250.9687	59.70	.Q	.	.	.	V.
24.167	251.3578	56.50	.Q	.	.	.	V.
24.250	251.6999	49.68	.Q	.	.	.	V.
24.333	251.9801	40.68	.Q	.	.	.	V.
24.417	252.1852	29.78	Q	.	.	.	V.
24.500	252.3211	19.73	Q	.	.	.	V.
24.583	252.4092	12.79	Q	.	.	.	V.
24.667	252.4669	8.37	Q	.	.	.	V.
24.750	252.5058	5.65	Q	.	.	.	V.
24.833	252.5329	3.93	Q	.	.	.	V.
24.917	252.5527	2.88	Q	.	.	.	V.
25.000	252.5691	2.38	Q	.	.	.	V.
25.083	252.5827	1.98	Q	.	.	.	V.
25.167	252.5939	1.62	Q	.	.	.	V.
25.250	252.6026	1.27	Q	.	.	.	V.
25.333	252.6095	1.00	Q	.	.	.	V.
25.417	252.6156	0.89	Q	.	.	.	V.
25.500	252.6211	0.79	Q	.	.	.	V.
25.583	252.6259	0.70	Q	.	.	.	V.
25.667	252.6302	0.62	Q	.	.	.	V.
25.750	252.6340	0.55	Q	.	.	.	V.
25.833	252.6373	0.48	Q	.	.	.	V.
25.917	252.6402	0.42	Q	.	.	.	V.
26.000	252.6427	0.37	Q	.	.	.	V.
26.083	252.6449	0.32	Q	.	.	.	V.
26.167	252.6468	0.28	Q	.	.	.	V.
26.250	252.6484	0.23	Q	.	.	.	V.
26.333	252.6497	0.20	Q	.	.	.	V.
26.417	252.6510	0.18	Q	.	.	.	V.
26.500	252.6521	0.16	Q	.	.	.	V.
26.583	252.6531	0.15	Q	.	.	.	V.
26.667	252.6540	0.13	Q	.	.	.	V.
26.750	252.6548	0.11	Q	.	.	.	V.
26.833	252.6555	0.10	Q	.	.	.	V.
26.917	252.6560	0.08	Q	.	.	.	V.
27.000	252.6565	0.06	Q	.	.	.	V.
27.083	252.6568	0.05	Q	.	.	.	V.
27.167	252.6570	0.03	Q	.	.	.	V.
27.250	252.6571	0.02	Q	.	.	.	V
27.333	252.6571	0.00	Q	.	.	.	V

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1640.0
10%	230.0
20%	70.0
30%	50.0
40%	35.0
50%	35.0
60%	25.0
70%	20.0
80%	15.0
90%	15.0

==========

END OF FLOODSCx ROUTING ANALYSIS

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

            F L O O D    R O U T I N G    A N A L Y S I S
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                        Analysis prepared by:

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                              Irvine, CA
                                92618

 ************************* DESCRIPTION OF STUDY *************************
* REDLANDS MASTER PLAN OF DRAINAGE                                      *
* UNIT HYDROGRAPH MODEL - NODE 20940 - REGIONAL                         *
* BY TMULI    JN: 136769    FEBRUARY 2014                               *
 ************************************************************************

  FILE NAME: 20940.DAT
  TIME/DATE OF STUDY: 10:11 02/27/2014


**************************************************************************
  FLOW PROCESS FROM NODE  20620.00 TO NODE  20940.00 IS CODE =   1
--------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
==========================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =    3993.800 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.400 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY(DEVELOPED):
                  "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.901
         FOOTHILL "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.000
         MOUNTAIN "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.000
         VALLEY(UNDEVELOPED)/DESERT:
                  "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.099
         DESERT(UNDEVELOPED) "S"-CURVE PERCENTAGE(DECIMAL NOTATION) =  0.000
         MAXIMUM WATERSHED LOSS RATE(INCH/HOUR) =  0.480
         LOW LOSS FRACTION = 0.510
         *HYDROGRAPH MODEL #1 SPECIFIED*

         SPECIFIED PEAK  5-MINUTES RAINFALL(INCH)=  0.43
         SPECIFIED PEAK 30-MINUTES RAINFALL(INCH)=  0.89
         SPECIFIED PEAK  1-HOUR RAINFALL(INCH) =  1.17
         SPECIFIED PEAK  3-HOUR RAINFALL(INCH) =  1.95
         SPECIFIED PEAK  6-HOUR RAINFALL(INCH) =  2.69
         SPECIFIED PEAK 24-HOUR RAINFALL(INCH) =  5.52

         *USER SPECIFIED PRECIPITATION DEPTH-AREA REDUCTION FACTORS:
```



```
          5-MINUTE FACTOR = 0.820
         30-MINUTE FACTOR = 0.820
          1-HOUR FACTOR = 0.820
          3-HOUR FACTOR = 0.970
          6-HOUR FACTOR = 0.990
         24-HOUR FACTOR = 0.990

       UNIT HYDROGRAPH TIME UNIT =   5.000 MINUTES
       UNIT INTERVAL PERCENTAGE OF LAG-TIME =  20.833
```

UNIT HYDROGRAPH DETERMINATION

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	1.268	612.297
2	5.276	1936.252
3	14.764	4582.287
4	27.810	6301.315
5	43.991	7815.470
6	60.879	8156.837
7	74.463	6561.334
8	83.445	4338.320
9	89.070	2716.493
10	92.808	1805.683
11	95.103	1108.411
12	96.506	677.568
13	97.093	283.745
14	97.608	248.870
15	98.103	238.792
16	98.576	228.709
17	99.011	209.816
18	99.109	47.654
19	99.203	45.285
20	99.282	38.213
21	99.359	36.894
22	99.429	33.957
23	99.490	29.351
24	99.550	29.296
25	99.607	27.416
26	99.649	20.069
27	99.689	19.346
28	99.729	19.339
29	99.769	19.346
30	99.803	16.597
31	99.819	7.801
32	99.834	7.145
33	99.849	7.153
34	99.864	7.149
35	99.879	7.145
36	99.893	7.153
37	99.908	7.156
38	99.923	7.153
39	99.938	7.156

40	99.953	7.153
41	99.967	7.156
42	99.982	7.153
43	99.997	7.156
44	100.000	1.430

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 874.0186
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 944.2702

==========

2 4 - H O U R S T O R M
R U N O F F H Y D R O G R A P H

==========

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0. 1000.0 2000.0 3000.0 4000.0
0.083	0.0203	2.95	Q . . . .
0.167	0.1051	12.30	Q . . . .
0.250	0.3423	34.44	Q . . . .
0.333	0.7893	64.92	Q . . . .
0.417	1.4972	102.78	VQ . . . .
0.500	2.4778	142.38	VQ . . . .
0.583	3.6788	174.39	VQ . . . .
0.667	5.0269	195.75	VQ . . . .
0.750	6.4688	209.36	V Q . . . .
0.833	7.9743	218.60	V Q . . . .
0.917	9.5205	224.51	V Q . . . .
1.000	11.0932	228.36	V Q . . . .
1.083	12.6795	230.32	V Q . . . .
1.167	14.2781	232.12	V Q . . . .
1.250	15.8889	233.89	V Q . . . .
1.333	17.5116	235.61	V Q . . . .
1.417	19.1455	237.25	V Q . . . .
1.500	20.7854	238.11	V Q . . . .
1.583	22.4312	238.97	V Q . . . .
1.667	24.0827	239.80	.VQ . . . .
1.750	25.7399	240.63	.VQ . . . .
1.833	27.4028	241.45	.VQ . . . .
1.917	29.0713	242.26	.VQ . . . .
2.000	30.7453	243.07	.VQ . . . .
2.083	32.4249	243.88	.VQ . . . .
2.167	34.1098	244.65	.VQ . . . .
2.250	35.8001	245.44	.VQ . . . .
2.333	37.4959	246.22	.VQ . . . .
2.417	39.1971	247.02	.VQ . . . .
2.500	40.9037	247.80	.VQ . . . .
2.583	42.6155	248.56	.VQ . . . .
2.667	44.3325	249.31	.VQ . . . .
2.750	46.0548	250.07	.VQ . . . .
2.833	47.7823	250.84	. Q . . . .
2.917	49.5151	251.61	. Q . . . .
3.000	51.2534	252.39	. Q . . . .
3.083	52.9970	253.18	. Q . . . .
3.167	54.7462	253.97	. Q . . . .
3.250	56.5008	254.78	. Q . . . .
3.333	58.2611	255.59	. Q . . . .
3.417	60.0269	256.41	. Q . . . .
3.500	61.7985	257.23	. Q . . . .
3.583	63.5758	258.06	. Q . . . .
3.667	65.3586	258.87	. Q . . . .
3.750	67.1471	259.69	. Q . . . .
3.833	68.9412	260.51	. Q . . . .
3.917	70.7411	261.34	. Q . . . .

4.000	72.5466	262.17	. QV	.	.	.	.	.
4.083	74.3581	263.02	. QV	.	.	.	.	.
4.167	76.1754	263.87	. QV	.	.	.	.	.
4.250	77.9986	264.74	. QV	.	.	.	.	.
4.333	79.8278	265.60	. QV	.	.	.	.	.
4.417	81.6631	266.49	. QV	.	.	.	.	.
4.500	83.5046	267.37	. QV	.	.	.	.	.
4.583	85.3522	268.27	. QV	.	.	.	.	.
4.667	87.2060	269.18	. QV	.	.	.	.	.
4.750	89.0662	270.10	. QV	.	.	.	.	.
4.833	90.9327	271.02	. QV	.	.	.	.	.
4.917	92.8058	271.96	. QV	.	.	.	.	.
5.000	94.6853	272.91	. Q V	.	.	.	.	.
5.083	96.5714	273.87	. Q V	.	.	.	.	.
5.167	98.4642	274.83	. Q V	.	.	.	.	.
5.250	100.3637	275.81	. Q V	.	.	.	.	.
5.333	102.2701	276.80	. Q V	.	.	.	.	.
5.417	104.1833	277.80	. Q V	.	.	.	.	.
5.500	106.1035	278.81	. Q V	.	.	.	.	.
5.583	108.0307	279.83	. Q V	.	.	.	.	.
5.667	109.9650	280.86	. Q V	.	.	.	.	.
5.750	111.9066	281.91	. Q V	.	.	.	.	.
5.833	113.8554	282.97	. Q V	.	.	.	.	.
5.917	115.8116	284.04	. Q V	.	.	.	.	.
6.000	117.7752	285.12	. Q V	.	.	.	.	.
6.083	119.7464	286.22	. Q V	.	.	.	.	.
6.167	121.7253	287.33	. Q V	.	.	.	.	.
6.250	123.7118	288.45	. Q V	.	.	.	.	.
6.333	125.7062	289.58	. Q V	.	.	.	.	.
6.417	127.7085	290.74	. Q V	.	.	.	.	.
6.500	129.7189	291.90	. Q V	.	.	.	.	.
6.583	131.7373	293.08	. Q V	.	.	.	.	.
6.667	133.7640	294.27	. Q V	.	.	.	.	.
6.750	135.7990	295.48	. Q V	.	.	.	.	.
6.833	137.8423	296.70	. Q V	.	.	.	.	.
6.917	139.8943	297.94	. Q V	.	.	.	.	.
7.000	141.9548	299.19	. Q V	.	.	.	.	.
7.083	144.0242	300.47	. Q V	.	.	.	.	.
7.167	146.1024	301.75	. Q V	.	.	.	.	.
7.250	148.1896	303.06	. Q V	.	.	.	.	.
7.333	150.2859	304.38	. Q V	.	.	.	.	.
7.417	152.3914	305.73	. Q V	.	.	.	.	.
7.500	154.5063	307.08	. Q V	.	.	.	.	.
7.583	156.6307	308.46	. Q V	.	.	.	.	.
7.667	158.7647	309.86	. Q V	.	.	.	.	.
7.750	160.9085	311.28	. Q V	.	.	.	.	.
7.833	163.0621	312.71	. Q V	.	.	.	.	.
7.917	165.2258	314.17	. Q V	.	.	.	.	.
8.000	167.3997	315.65	. Q V	.	.	.	.	.
8.083	169.5840	317.15	. Q V	.	.	.	.	.
8.167	171.7787	318.67	. Q V	.	.	.	.	.
8.250	173.9841	320.22	. Q V	.	.	.	.	.
8.333	176.2003	321.79	. Q V	.	.	.	.	.
8.417	178.4275	323.38	. Q V	.	.	.	.	.
8.500	180.6657	325.00	. Q V	.	.	.	.	.
8.583	182.9153	326.65	. Q V	.	.	.	.	.
8.667	185.1764	328.31	. Q V	.	.	.	.	.
8.750	187.4492	330.01	. Q V	.	.	.	.	.

8.833	189.7338	331.73	. Q V	.	.	.	.	.
8.917	192.0305	333.48	. Q V	.	.	.	.	.
9.000	194.3395	335.26	. Q V	.	.	.	.	.
9.083	196.6609	337.07	. Q V	.	.	.	.	.
9.167	198.9950	338.90	. Q V	.	.	.	.	.
9.250	201.3419	340.78	. Q V	.	.	.	.	.
9.333	203.7020	342.68	. Q V	.	.	.	.	.
9.417	206.0754	344.62	. Q V	.	.	.	.	.
9.500	208.4624	346.58	. Q V	.	.	.	.	.
9.583	210.8631	348.59	. Q V	.	.	.	.	.
9.667	213.2779	350.63	. Q V.	.	.	.	.	.
9.750	215.7071	352.71	. Q V.	.	.	.	.	.
9.833	218.1508	354.82	. Q V.	.	.	.	.	.
9.917	220.6094	356.99	. Q V.	.	.	.	.	.
10.000	223.0831	359.18	. Q V.	.	.	.	.	.
10.083	225.5722	361.42	. Q V.	.	.	.	.	.
10.167	228.0770	363.70	. Q V.	.	.	.	.	.
10.250	230.5979	366.04	. Q V.	.	.	.	.	.
10.333	233.1352	368.40	. Q V.	.	.	.	.	.
10.417	235.6891	370.83	. Q V.	.	.	.	.	.
10.500	238.2601	373.30	. Q V	.	.	.	.	.
10.583	240.8484	375.83	. Q V	.	.	.	.	.
10.667	243.4545	378.40	. Q V	.	.	.	.	.
10.750	246.0788	381.04	. Q V	.	.	.	.	.
10.833	248.7215	383.72	. Q V	.	.	.	.	.
10.917	251.3832	386.48	. Q V	.	.	.	.	.
11.000	254.0643	389.29	. Q V	.	.	.	.	.
11.083	256.7652	392.17	. Q V	.	.	.	.	.
11.167	259.4862	395.10	. Q V	.	.	.	.	.
11.250	262.2281	398.12	. Q .V	.	.	.	.	.
11.333	264.9912	401.19	. Q .V	.	.	.	.	.
11.417	267.7760	404.36	. Q .V	.	.	.	.	.
11.500	270.5831	407.59	. Q .V	.	.	.	.	.
11.583	273.4131	410.92	. Q .V	.	.	.	.	.
11.667	276.2664	414.31	. Q .V	.	.	.	.	.
11.750	279.1439	417.81	. Q .V	.	.	.	.	.
11.833	282.0459	421.38	. Q .V	.	.	.	.	.
11.917	284.9734	425.07	. Q . V	.	.	.	.	.
12.000	287.9268	428.84	. Q . V	.	.	.	.	.
12.083	290.9051	432.46	. Q . V	.	.	.	.	.
12.167	293.9049	435.56	. Q . V	.	.	.	.	.
12.250	296.9188	437.62	. Q . V	.	.	.	.	.
12.333	299.9421	438.99	. Q . V	.	.	.	.	.
12.417	302.9713	439.84	. Q . V	.	.	.	.	.
12.500	306.0060	440.63	. Q . V	.	.	.	.	.
12.583	309.0523	442.33	. Q . V	.	.	.	.	.
12.667	312.1181	445.15	. Q . V	.	.	.	.	.
12.750	315.2097	448.90	. Q . V	.	.	.	.	.
12.833	318.3308	453.19	. Q . V	.	.	.	.	.
12.917	321.4852	458.02	. Q . V	.	.	.	.	.
13.000	324.6752	463.19	. Q . V	.	.	.	.	.
13.083	327.9038	468.79	. Q . V	.	.	.	.	.
13.167	331.1722	474.57	. Q . V	.	.	.	.	.
13.250	334.4824	480.64	. Q . V	.	.	.	.	.
13.333	337.8358	486.90	. Q . V	.	.	.	.	.
13.417	341.2344	493.49	. Q . V	.	.	.	.	.
13.500	344.6805	500.38	. Q . V	.	.	.	.	.
13.583	348.1765	507.62	. Q . V	.	.	.	.	.

13.667	351.7242	515.13	. Q . V . . .
13.750	355.3265	523.05	. Q . V . . .
13.833	358.9855	531.28	. Q . V . . .
13.917	362.7044	539.99	. Q . V . . .
14.000	366.4858	549.07	. Q . V . . .
14.083	370.3470	560.65	. Q . V . . .
14.167	374.3203	576.91	. Q . V . . .
14.250	378.4680	602.25	. Q . V . . .
14.333	382.8313	633.55	. Q . V . . .
14.417	387.4480	670.35	. Q . V . . .
14.500	392.3292	708.75	. Q . V . . .
14.583	397.4449	742.80	. Q . V . . .
14.667	402.7506	770.39	. Q . V . . .
14.750	408.2173	793.76	. Q . V . . .
14.833	413.8310	815.10	. Q . V . . .
14.917	419.5850	835.49	. Q . V . . .
15.000	425.4780	855.66	. Q . V . . .
15.083	431.5127	876.24	. Q . V . . .
15.167	437.6992	898.28	. Q . V . . .
15.250	444.0529	922.56	. Q. V . . .
15.333	450.5887	948.99	. Q. V. . .
15.417	457.2912	973.21	. Q. V. . .
15.500	464.0998	988.61	. Q. V. . .
15.583	470.8894	985.85	. Q. V. . .
15.667	477.5952	973.68	. Q. V . . .
15.750	484.1924	957.90	. Q. V . . .
15.833	490.7470	951.73	. Q. V . . .
15.917	497.5326	985.27	. Q. .V . . .
16.000	505.0351	1089.37	. Q .V . . .
16.083	514.9335	1437.24	. . Q .V . . .
16.167	528.9828	2039.96	. . Q V . . .
16.250	549.3779	2961.37	. . . V Q. . .
16.333	573.9592	3569.20	. . . V . Q .
16.417	601.4869	3997.01	. . . V . Q.
16.500	628.7899	3964.40	. . . V . Q.
16.583	651.8176	3343.63	. . . V . Q .
16.667	669.4640	2562.26	. . . Q V . .
16.750	683.1661	1989.54	. . Q. V . .
16.833	694.5177	1648.26	. . Q . V. .
16.917	704.0595	1385.47	. . Q . V. .
17.000	712.3344	1201.51	. . Q . V . .
17.083	719.5175	1042.99	. Q . V . .
17.167	726.3068	985.80	. Q. . V . .
17.250	732.7247	931.89	. Q. . .V . .
17.333	738.7378	873.10	. Q . . .V . .
17.417	744.2751	804.02	. Q . . .V . .
17.500	749.1215	703.70	. Q . . .V . .
17.583	753.6380	655.80	. Q . . .V . .
17.667	757.8936	617.91	. Q . . . V . .
17.750	761.9517	589.24	. Q . . . V . .
17.833	765.8345	563.77	. Q . . . V . .
17.917	769.5674	542.03	. Q . . . V . .
18.000	773.1779	524.23	. Q . . . V . .
18.083	776.6806	508.60	. Q . . . V . .
18.167	780.0794	493.51	. Q . . . . V .
18.250	783.4020	482.43	. Q . . . . V .
18.333	786.6611	473.23	. Q . . . . V .
18.417	789.8660	465.34	. Q . . . . V .

18.500	793.0189	457.80	. Q . . . V .
18.583	796.1099	448.81	. Q . . . V .
18.667	799.1519	441.71	. Q . . . V .
18.750	802.1454	434.65	. Q . . . V .
18.833	805.0907	427.66	. Q . . . V .
18.917	807.9882	420.72	. Q . . . V .
19.000	810.8395	414.00	. Q . . . V .
19.083	813.6458	407.47	. Q . . . V .
19.167	816.4091	401.25	. Q . . . V .
19.250	819.1316	395.30	. Q . . . V .
19.333	821.8148	389.59	. Q . . . V .
19.417	824.4601	384.10	. Q . . . V .
19.500	827.0681	378.68	. Q . . . V .
19.583	829.6391	373.31	. Q . . . V .
19.667	832.1647	366.72	. Q . . . V .
19.750	834.6550	361.58	. Q . . . V .
19.833	837.1142	357.08	. Q . . . V .
19.917	839.5438	352.77	. Q . . . V .
20.000	841.9445	348.59	. Q . . . V .
20.083	844.3175	344.56	. Q . . . V .
20.167	846.6637	340.67	. Q . . . V .
20.250	848.9841	336.92	. Q . . . V .
20.333	851.2794	333.29	. Q . . . V .
20.417	853.5506	329.78	. Q . . . V .
20.500	855.7984	326.38	. Q . . . V .
20.583	858.0235	323.09	. Q . . . V .
20.667	860.2267	319.91	. Q . . . V .
20.750	862.4088	316.84	. Q . . . V .
20.833	864.5703	313.85	. Q . . . V .
20.917	866.7119	310.95	. Q . . . V .
21.000	868.8340	308.14	. Q . . . V .
21.083	870.9373	305.40	. Q . . . V .
21.167	873.0222	302.73	. Q . . . V .
21.250	875.0892	300.14	. Q . . . V .
21.333	877.1389	297.61	. Q . . . V .
21.417	879.1716	295.15	. Q . . . V .
21.500	881.1878	292.75	. Q . . . V .
21.583	883.1879	290.41	. Q . . . V .
21.667	885.1722	288.13	. Q . . . V .
21.750	887.1412	285.90	. Q . . . V .
21.833	889.0952	283.72	. Q . . . V .
21.917	891.0345	281.59	. Q . . . V .
22.000	892.9596	279.52	. Q . . . V .
22.083	894.8707	277.48	. Q . . . V .
22.167	896.7680	275.50	. Q . . . V .
22.250	898.6520	273.55	. Q . . . V .
22.333	900.5229	271.65	. Q . . . V .
22.417	902.3810	269.79	. Q . . . V .
22.500	904.2265	267.97	. Q . . . V .
22.583	906.0598	266.18	. Q . . . V .
22.667	907.8809	264.44	. Q . . . V .
22.750	909.6903	262.72	. Q . . . V .
22.833	911.4881	261.04	. Q . . . V .
22.917	913.2745	259.39	. Q . . . V .
23.000	915.0499	257.78	. Q . . . V .
23.083	916.8143	256.20	. Q . . . V .
23.167	918.5680	254.64	. Q . . . V .
23.250	920.3112	253.12	. Q . . . V .

23.333	922.0441	251.62	. Q	.	.	.	V.
23.417	923.7669	250.15	. Q	.	.	.	V.
23.500	925.4797	248.70	. Q	.	.	.	V.
23.583	927.1828	247.28	. Q	.	.	.	V.
23.667	928.8762	245.89	. Q	.	.	.	V.
23.750	930.5602	244.52	. Q	.	.	.	V.
23.833	932.2349	243.17	. Q	.	.	.	V.
23.917	933.9005	241.84	. Q	.	.	.	V.
24.000	935.5571	240.54	. Q	.	.	.	V.
24.083	937.1846	236.31	. Q	.	.	.	V.
24.167	938.7393	225.74	. Q	.	.	.	V.
24.250	940.1338	202.48	. Q	.	.	.	V.
24.333	941.3120	171.08	.Q	.	.	.	V.
24.417	942.2249	132.55	.Q	.	.	.	V.
24.500	942.8624	92.57	Q	.	.	.	V.
24.583	943.2790	60.49	Q	.	.	.	V.
24.667	943.5495	39.28	Q	.	.	.	V.
24.750	943.7285	25.99	Q	.	.	.	V.
24.833	943.8466	17.15	Q	.	.	.	V.
24.917	943.9274	11.72	Q	.	.	.	V.
25.000	943.9852	8.40	Q	.	.	.	V.
25.083	944.0333	6.99	Q	.	.	.	V.
25.167	944.0729	5.75	Q	.	.	.	V.
25.250	944.1044	4.57	Q	.	.	.	V.
25.333	944.1281	3.44	Q	.	.	.	V.
25.417	944.1447	2.41	Q	.	.	.	V.
25.500	944.1597	2.17	Q	.	.	.	V.
25.583	944.1730	1.94	Q	.	.	.	V.
25.667	944.1851	1.75	Q	.	.	.	V.
25.750	944.1958	1.56	Q	.	.	.	V.
25.833	944.2053	1.39	Q	.	.	.	V.
25.917	944.2139	1.24	Q	.	.	.	V.
26.000	944.2214	1.09	Q	.	.	.	V.
26.083	944.2279	0.95	Q	.	.	.	V.
26.167	944.2338	0.85	Q	.	.	.	V.
26.250	944.2390	0.75	Q	.	.	.	V.
26.333	944.2435	0.66	Q	.	.	.	V.
26.417	944.2473	0.56	Q	.	.	.	V.
26.500	944.2506	0.48	Q	.	.	.	V.
26.583	944.2536	0.44	Q	.	.	.	V.
26.667	944.2563	0.40	Q	.	.	.	V.
26.750	944.2589	0.36	Q	.	.	.	V.
26.833	944.2611	0.33	Q	.	.	.	V.
26.917	944.2631	0.29	Q	.	.	.	V.
27.000	944.2649	0.25	Q	.	.	.	V.
27.083	944.2664	0.22	Q	.	.	.	V.
27.167	944.2677	0.18	Q	.	.	.	V.
27.250	944.2687	0.15	Q	.	.	.	V.
27.333	944.2695	0.11	Q	.	.	.	V.
27.417	944.2701	0.08	Q	.	.	.	V.
27.500	944.2704	0.04	Q	.	.	.	V
27.583	944.2704	0.01	Q	.	.	.	V

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1655.0
10%	475.0
20%	160.0
30%	60.0
40%	45.0
50%	35.0
60%	30.0
70%	25.0
80%	20.0
90%	10.0

END OF FLOODSCx ROUTING ANALYSIS

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

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                        Analysis prepared by:

                            RBF Consulting
                          14257 Alton Parkway
                               Irvine, CA
                                 92618

 ************************* DESCRIPTION OF STUDY *************************
* REDLANDS MASTER PLAN OF DRAINAGE                                      *
* SMALL AREA HYDROGRAPH MODEL - NODE 20954                              *
* BY TMULI      JN: 136769     FEBRUARY 2014                            *
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    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   34.38
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.270
    LOW LOSS FRACTION = 0.380
    TIME OF CONCENTRATION(MIN.) = 13.78
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.46
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.95
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.25
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.03
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  2.75
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.50

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    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     9.31
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     6.45

**************************************************************************
  TIME     VOLUME       Q    0.       22.5      45.0      67.5      90.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------
  0.15      0.0139      2.20  Q         .         .         .         .
  0.38      0.0558      2.21  Q         .         .         .         .
  0.61      0.0979      2.23  Q         .         .         .         .
  0.84      0.1403      2.24  Q         .         .         .         .
  1.07      0.1831      2.26  .Q        .         .         .         .
  1.30      0.2262      2.28  .Q        .         .         .         .
  1.53      0.2696      2.30  .Q        .         .         .         .
  1.76      0.3134      2.31  .Q        .         .         .         .
  1.99      0.3575      2.34  .Q        .         .         .         .
  2.22      0.4019      2.35  .Q        .         .         .         .
```



```
  2.45      0.4468      2.38  .Q        .         .         .         .
  2.68      0.4920      2.39  .Q        .         .         .         .
  2.91      0.5376      2.42  .Q        .         .         .         .
  3.14      0.5836      2.43  .Q        .         .         .         .
  3.37      0.6300      2.46  .Q        .         .         .         .
  3.60      0.6768      2.47  .Q        .         .         .         .
  3.83      0.7240      2.50  .Q        .         .         .         .
  4.06      0.7717      2.52  .Q        .         .         .         .
  4.29      0.8199      2.55  .Q        .         .         .         .
  4.52      0.8685      2.57  .Q        .         .         .         .
  4.75      0.9176      2.60  .Q        .         .         .         .
  4.98      0.9671      2.62  .Q        .         .         .         .
  5.21      1.0172      2.66  .Q        .         .         .         .
  5.44      1.0679      2.68  .Q        .         .         .         .
  5.67      1.1190      2.72  .Q        .         .         .         .
  5.89      1.1707      2.74  .Q        .         .         .         .
  6.12      1.2231      2.78  .Q        .         .         .         .
  6.35      1.2760      2.80  .Q        .         .         .         .
  6.58      1.3295      2.84  .Q        .         .         .         .
  6.81      1.3837      2.87  .Q        .         .         .         .
  7.04      1.4385      2.91  .Q        .         .         .         .
  7.27      1.4940      2.94  .Q        .         .         .         .
  7.50      1.5503      2.99  .Q        .         .         .         .
  7.73      1.6073      3.02  .Q        .         .         .         .
  7.96      1.6651      3.07  .Q        .         .         .         .
  8.19      1.7236      3.10  .Q        .         .         .         .
  8.42      1.7831      3.16  .Q        .         .         .         .
  8.65      1.8434      3.19  .Q        .         .         .         .
  8.88      1.9047      3.26  .Q        .         .         .         .
  9.11      1.9669      3.30  .Q        .         .         .         .
  9.34      2.0301      3.37  .Q        .         .         .         .
  9.57      2.0944      3.41  .Q        .         .         .         .
  9.80      2.1599      3.49  .Q        .         .         .         .
 10.03      2.2265      3.53  .Q        .         .         .         .
 10.26      2.2944      3.62  .Q        .         .         .         .
 10.49      2.3636      3.67  .Q        .         .         .         .
 10.72      2.4342      3.77  .Q        .         .         .         .
 10.95      2.5063      3.83  .Q        .         .         .         .
 11.18      2.5800      3.94  .Q        .         .         .         .
 11.41      2.6554      4.00  .Q        .         .         .         .
 11.64      2.7327      4.14  .Q        .         .         .         .
 11.87      2.8119      4.21  .Q        .         .         .         .
 12.10      2.8926      4.30  .Q        .         .         .         .
 12.33      2.9704      3.90  .Q        .         .         .         .
 12.55      3.0463      4.09  .Q        .         .         .         .
 12.78      3.1248      4.19  .Q        .         .         .         .
 13.01      3.2064      4.41  .Q        .         .         .         .
 13.24      3.2914      4.54  . Q       .         .         .         .
 13.47      3.3803      4.82  . Q       .         .         .         .
 13.70      3.4734      4.99  . Q       .         .         .         .
 13.93      3.5716      5.36  . Q       .         .         .         .
 14.16      3.6755      5.58  . Q       .         .         .         .
 14.39      3.7869      6.15  . Q       .         .         .         .
 14.62      3.9067      6.47  . Q       .         .         .         .
 14.85      4.0373      7.29  .  Q      .         .         .         .
 15.08      4.1807      7.82  .  Q      .         .         .         .
 15.31      4.3431      9.30  .   Q     .         .         .         .
 15.54      4.5265     10.02  .   Q     .         .         .         .
```

15.77	4.7489	13.42	. Q	.	.	.	.
16.00	5.0841	21.90	.	Q.	.	.	.
16.23	6.0992	85.06	.	.	.	.	Q .
16.46	7.0096	10.87	. Q	.	.	.	.
16.69	7.1932	8.47	. Q	.	.	.	.
16.92	7.3385	6.85	. Q	.	.	.	.
17.15	7.4593	5.87	. Q	.	.	.	.
17.38	7.5640	5.16	. Q	.	.	.	.
17.61	7.6574	4.68	. Q	.	.	.	.
17.84	7.7425	4.30	.Q	.	.	.	.
18.07	7.8212	3.99	.Q	.	.	.	.
18.30	7.8998	4.29	.Q	.	.	.	.
18.53	7.9791	4.07	.Q	.	.	.	.
18.76	8.0545	3.88	.Q	.	.	.	.
18.99	8.1267	3.72	.Q	.	.	.	.
19.22	8.1959	3.58	.Q	.	.	.	.
19.44	8.2625	3.45	.Q	.	.	.	.
19.67	8.3269	3.33	.Q	.	.	.	.
19.90	8.3891	3.23	.Q	.	.	.	.
20.13	8.4494	3.13	.Q	.	.	.	.
20.36	8.5080	3.04	.Q	.	.	.	.
20.59	8.5651	2.96	.Q	.	.	.	.
20.82	8.6206	2.89	.Q	.	.	.	.
21.05	8.6748	2.82	.Q	.	.	.	.
21.28	8.7277	2.76	.Q	.	.	.	.
21.51	8.7794	2.70	.Q	.	.	.	.
21.74	8.8301	2.64	.Q	.	.	.	.
21.97	8.8796	2.59	.Q	.	.	.	.
22.20	8.9283	2.54	.Q	.	.	.	.
22.43	8.9759	2.49	.Q	.	.	.	.
22.66	9.0228	2.44	.Q	.	.	.	.
22.89	9.0688	2.40	.Q	.	.	.	.
23.12	9.1140	2.36	.Q	.	.	.	.
23.35	9.1585	2.32	.Q	.	.	.	.
23.58	9.2022	2.29	.Q	.	.	.	.
23.81	9.2453	2.25	.Q	.	.	.	.
24.04	9.2877	2.22	Q	.	.	.	.
24.27	9.3088	0.00	Q	.	.	.	.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1446.9
10%	82.7
20%	27.6
30%	13.8
40%	13.8
50%	13.8
60%	13.8
70%	13.8
80%	13.8
90%	13.8

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                        Analysis prepared by:

                            RBF Consulting
                          14257 Alton Parkway
                               Irvine, CA
                                 92618

 ************************* DESCRIPTION OF STUDY *************************
* REDLANDS MASTER PLAN OF DRAINAGE                                      *
* SMALL AREA HYDROGRAPH MODEL - NODE 20358                              *
* BY TMULI      JN: 136769     MARCH 2014                               *
 ************************************************************************

  ------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   28.46
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.300
    LOW LOSS FRACTION = 0.426
    TIME OF CONCENTRATION(MIN.) = 15.26
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.46
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.95
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.25
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.03
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  2.75
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.50

------------------------------------------------------------------------

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     7.25
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     5.80

**************************************************************************
  TIME     VOLUME       Q    0.       17.5      35.0      52.5      70.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------
  0.23      0.0177      1.69  Q         .         .         .         .
  0.49      0.0534      1.70  Q         .         .         .         .
  0.74      0.0893      1.71  Q         .         .         .         .
  0.99      0.1254      1.73  Q         .         .         .         .
  1.25      0.1619      1.74  Q         .         .         .         .
  1.50      0.1987      1.76  .Q        .         .         .         .
  1.76      0.2358      1.77  .Q        .         .         .         .
  2.01      0.2733      1.79  .Q        .         .         .         .
  2.27      0.3111      1.80  .Q        .         .         .         .
  2.52      0.3492      1.83  .Q        .         .         .         .
```



```
  2.77      0.3877      1.84  .Q        .         .         .         .
  3.03      0.4265      1.86  .Q        .         .         .         .
  3.28      0.4658      1.87  .Q        .         .         .         .
  3.54      0.5054      1.90  .Q        .         .         .         .
  3.79      0.5454      1.91  .Q        .         .         .         .
  4.05      0.5858      1.94  .Q        .         .         .         .
  4.30      0.6267      1.95  .Q        .         .         .         .
  4.55      0.6680      1.98  .Q        .         .         .         .
  4.81      0.7097      1.99  .Q        .         .         .         .
  5.06      0.7519      2.02  .Q        .         .         .         .
  5.32      0.7946      2.04  .Q        .         .         .         .
  5.57      0.8378      2.07  .Q        .         .         .         .
  5.83      0.8816      2.09  .Q        .         .         .         .
  6.08      0.9258      2.12  .Q        .         .         .         .
  6.34      0.9706      2.14  .Q        .         .         .         .
  6.59      1.0160      2.18  .Q        .         .         .         .
  6.84      1.0620      2.20  .Q        .         .         .         .
  7.10      1.1087      2.24  .Q        .         .         .         .
  7.35      1.1559      2.26  .Q        .         .         .         .
  7.61      1.2039      2.30  .Q        .         .         .         .
  7.86      1.2526      2.33  .Q        .         .         .         .
  8.12      1.3020      2.38  .Q        .         .         .         .
  8.37      1.3523      2.40  .Q        .         .         .         .
  8.62      1.4033      2.45  .Q        .         .         .         .
  8.88      1.4552      2.48  .Q        .         .         .         .
  9.13      1.5080      2.54  .Q        .         .         .         .
  9.39      1.5618      2.57  .Q        .         .         .         .
  9.64      1.6165      2.64  .Q        .         .         .         .
  9.90      1.6724      2.67  .Q        .         .         .         .
 10.15      1.7294      2.75  .Q        .         .         .         .
 10.40      1.7876      2.79  .Q        .         .         .         .
 10.66      1.8471      2.87  .Q        .         .         .         .
 10.91      1.9079      2.92  .Q        .         .         .         .
 11.17      1.9703      3.02  .Q        .         .         .         .
 11.42      2.0342      3.07  .Q        .         .         .         .
 11.68      2.0999      3.18  .Q        .         .         .         .
 11.93      2.1674      3.24  .Q        .         .         .         .
 12.18      2.2344      3.13  .Q        .         .         .         .
 12.44      2.2992      3.03  .Q        .         .         .         .
 12.69      2.3646      3.20  .Q        .         .         .         .
 12.95      2.4328      3.29  .Q        .         .         .         .
 13.20      2.5040      3.49  .Q        .         .         .         .
 13.46      2.5787      3.61  . Q       .         .         .         .
 13.71      2.6575      3.88  . Q       .         .         .         .
 13.97      2.7408      4.04  . Q       .         .         .         .
 14.22      2.8300      4.45  . Q       .         .         .         .
 14.47      2.9261      4.69  . Q       .         .         .         .
 14.73      3.0309      5.28  .  Q      .         .         .         .
 14.98      3.1459      5.66  .  Q      .         .         .         .
 15.24      3.2762      6.74  .  Q      .         .         .         .
 15.49      3.4263      7.54  .   Q     .         .         .         .
 15.75      3.6068      9.64  .    Q    .         .         .         .
 16.00      3.8748     15.87  .        Q.         .         .         .
 16.25      4.7257     65.09  .         .         .         .      Q  .
 16.51      5.4927      7.89  .   Q     .         .         .         .
 16.76      5.6402      6.14  .  Q      .         .         .         .
 17.02      5.7568      4.96  . Q       .         .         .         .
 17.27      5.8533      4.22  . Q       .         .         .         .
```

17.53	5.9370	3.74	. Q	.	.	.	.
17.78	6.0118	3.39	.Q	.	.	.	.
18.03	6.0801	3.11	.Q	.	.	.	.
18.29	6.1476	3.31	.Q	.	.	.	.
18.54	6.2152	3.12	.Q	.	.	.	.
18.80	6.2792	2.97	.Q	.	.	.	.
19.05	6.3401	2.83	.Q	.	.	.	.
19.31	6.3983	2.71	.Q	.	.	.	.
19.56	6.4542	2.61	.Q	.	.	.	.
19.82	6.5080	2.51	.Q	.	.	.	.
20.07	6.5599	2.43	.Q	.	.	.	.
20.32	6.6101	2.35	.Q	.	.	.	.
20.58	6.6588	2.28	.Q	.	.	.	.
20.83	6.7061	2.22	.Q	.	.	.	.
21.09	6.7521	2.16	.Q	.	.	.	.
21.34	6.7970	2.11	.Q	.	.	.	.
21.60	6.8407	2.06	.Q	.	.	.	.
21.85	6.8834	2.01	.Q	.	.	.	.
22.10	6.9251	1.96	.Q	.	.	.	.
22.36	6.9660	1.92	.Q	.	.	.	.
22.61	7.0060	1.88	.Q	.	.	.	.
22.87	7.0452	1.85	.Q	.	.	.	.
23.12	7.0837	1.81	.Q	.	.	.	.
23.38	7.1215	1.78	.Q	.	.	.	.
23.63	7.1586	1.75	.Q	.	.	.	.
23.88	7.1951	1.72	Q	.	.	.	.
24.14	7.2310	1.69	Q	.	.	.	.
24.39	7.2488	0.00	Q	.	.	.	.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1449.7
10%	91.6
20%	30.5
30%	15.3
40%	15.3
50%	15.3
60%	15.3
70%	15.3
80%	15.3
90%	15.3

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******************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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                          Analysis prepared by:




******************************************************************************
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 Problem Descriptions:
  REDLANDS
  NODE 20960 TO NODE 20968
  APR 2014 DMALOTT
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   12.87
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.102
    LOW LOSS FRACTION = 0.109
    TIME OF CONCENTRATION(MIN.) = 11.53
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.52
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  1.09
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.45
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.43
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  3.36
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.63

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    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     4.87
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     1.17

******************************************************************************
  TIME     VOLUME       Q    0.       12.5      25.0      37.5      50.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.05      0.0000      0.00  Q         .         .         .         .
  0.24      0.0072      0.90  Q         .         .         .         .
  0.43      0.0216      0.91  Q         .         .         .         .
  0.63      0.0361      0.92  Q         .         .         .         .
  0.82      0.0508      0.93  Q         .         .         .         .
  1.01      0.0655      0.93  Q         .         .         .         .
  1.20      0.0804      0.94  Q         .         .         .         .
  1.40      0.0954      0.95  Q         .         .         .         .
  1.59      0.1105      0.96  Q         .         .         .         .
  1.78      0.1258      0.96  Q         .         .         .         .
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  1.97      0.1411      0.97  Q         .         .         .         .
  2.16      0.1566      0.98  Q         .         .         .         .
  2.36      0.1723      0.99  Q         .         .         .         .
  2.55      0.1880      1.00  Q         .         .         .         .
  2.74      0.2040      1.01  Q         .         .         .         .
  2.93      0.2200      1.01  Q         .         .         .         .
  3.12      0.2362      1.03  Q         .         .         .         .
  3.32      0.2526      1.03  Q         .         .         .         .
  3.51      0.2691      1.05  Q         .         .         .         .
  3.70      0.2858      1.05  Q         .         .         .         .
  3.89      0.3026      1.07  Q         .         .         .         .
  4.09      0.3196      1.07  Q         .         .         .         .
  4.28      0.3368      1.09  Q         .         .         .         .
  4.47      0.3541      1.10  Q         .         .         .         .
  4.66      0.3716      1.11  Q         .         .         .         .
  4.85      0.3893      1.12  Q         .         .         .         .
  5.05      0.4072      1.14  Q         .         .         .         .
  5.24      0.4253      1.14  Q         .         .         .         .
  5.43      0.4436      1.16  Q         .         .         .         .
  5.62      0.4621      1.17  Q         .         .         .         .
  5.82      0.4809      1.19  Q         .         .         .         .
  6.01      0.4998      1.20  Q         .         .         .         .
  6.20      0.5190      1.22  Q         .         .         .         .
  6.39      0.5383      1.23  Q         .         .         .         .
  6.58      0.5580      1.25  Q         .         .         .         .
  6.78      0.5779      1.26  .Q        .         .         .         .
  6.97      0.5980      1.28  .Q        .         .         .         .
  7.16      0.6184      1.29  .Q        .         .         .         .
  7.35      0.6391      1.31  .Q        .         .         .         .
  7.54      0.6601      1.33  .Q        .         .         .         .
  7.74      0.6813      1.35  .Q        .         .         .         .
  7.93      0.7029      1.36  .Q        .         .         .         .
  8.12      0.7248      1.39  .Q        .         .         .         .
  8.31      0.7470      1.41  .Q        .         .         .         .
  8.51      0.7696      1.44  .Q        .         .         .         .
  8.70      0.7925      1.45  .Q        .         .         .         .
  8.89      0.8158      1.48  .Q        .         .         .         .
  9.08      0.8395      1.50  .Q        .         .         .         .
  9.27      0.8636      1.53  .Q        .         .         .         .
  9.47      0.8881      1.55  .Q        .         .         .         .
  9.66      0.9131      1.59  .Q        .         .         .         .
  9.85      0.9385      1.61  .Q        .         .         .         .
 10.04      0.9644      1.65  .Q        .         .         .         .
 10.24      0.9909      1.68  .Q        .         .         .         .
 10.43      1.0179      1.72  .Q        .         .         .         .
 10.62      1.0454      1.75  .Q        .         .         .         .
 10.81      1.0736      1.80  .Q        .         .         .         .
 11.00      1.1024      1.83  .Q        .         .         .         .
 11.20      1.1319      1.89  .Q        .         .         .         .
 11.39      1.1621      1.92  .Q        .         .         .         .
 11.58      1.1931      1.99  .Q        .         .         .         .
 11.77      1.2249      2.02  .Q        .         .         .         .
 11.96      1.2576      2.10  .Q        .         .         .         .
 12.16      1.2923      2.26  .Q        .         .         .         .
 12.35      1.3324      2.78  . Q       .         .         .         .
 12.54      1.3770      2.84  . Q       .         .         .         .
 12.73      1.4229      2.95  . Q       .         .         .         .
 12.93      1.4702      3.01  . Q       .         .         .         .
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13.12	1.5191	3.14	. Q . . . .
13.31	1.5696	3.22	. Q . . . .
13.50	1.6220	3.38	. Q . . . .
13.69	1.6764	3.47	. Q . . . .
13.89	1.7332	3.68	. Q . . . .
14.08	1.7925	3.80	. Q . . . .
14.27	1.8551	4.09	. Q . . . .
14.46	1.9213	4.24	. Q . . . .
14.65	1.9917	4.62	. Q . . . .
14.85	2.0669	4.85	. Q . . . .
15.04	2.1485	5.43	. Q . . . .
15.23	2.2376	5.80	. Q . . . .
15.42	2.3365	6.66	. Q . . . .
15.62	2.4428	6.72	. Q . . . .
15.81	2.5721	9.56	. Q . . . .
16.00	2.7552	13.49	. Q . . . .
16.19	3.2044	43.08	. . . . Q .
16.38	3.6085	7.81	. Q . . . .
16.58	3.7201	6.26	. Q . . . .
16.77	3.8104	5.11	. Q . . . .
16.96	3.8861	4.42	. Q . . . .
17.15	3.9525	3.94	. Q . . . .
17.35	4.0121	3.57	. Q . . . .
17.54	4.0666	3.30	. Q . . . .
17.73	4.1172	3.07	. Q . . . .
17.92	4.1646	2.89	. Q . . . .
18.11	4.2093	2.74	. Q . . . .
18.31	4.2473	2.06	.Q . . . .
18.50	4.2792	1.95	.Q . . . .
18.69	4.3094	1.86	.Q . . . .
18.88	4.3383	1.77	.Q . . . .
19.07	4.3658	1.70	.Q . . . .
19.27	4.3923	1.63	.Q . . . .
19.46	4.4177	1.57	.Q . . . .
19.65	4.4422	1.52	.Q . . . .
19.84	4.4659	1.47	.Q . . . .
20.04	4.4889	1.42	.Q . . . .
20.23	4.5111	1.38	.Q . . . .
20.42	4.5327	1.34	.Q . . . .
20.61	4.5536	1.30	.Q . . . .
20.80	4.5741	1.27	.Q . . . .
21.00	4.5939	1.24	Q . . . .
21.19	4.6133	1.21	Q . . . .
21.38	4.6323	1.18	Q . . . .
21.57	4.6508	1.15	Q . . . .
21.77	4.6689	1.13	Q . . . .
21.96	4.6866	1.10	Q . . . .
22.15	4.7039	1.08	Q . . . .
22.34	4.7209	1.06	Q . . . .
22.53	4.7376	1.04	Q . . . .
22.73	4.7540	1.02	Q . . . .
22.92	4.7700	1.00	Q . . . .
23.11	4.7858	0.98	Q . . . .
23.30	4.8013	0.97	Q . . . .
23.49	4.8166	0.95	Q . . . .
23.69	4.8316	0.94	Q . . . .
23.88	4.8463	0.92	Q . . . .
24.07	4.8608	0.91	Q . . . .

24.26	4.8680	0.00	Q . . . .

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1441.2
10%	149.9
20%	34.6
30%	23.1
40%	11.5
50%	11.5
60%	11.5
70%	11.5
80%	11.5
90%	11.5

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******************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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                          Analysis prepared by:

                              RBF Consulting
                            14257 Alton Parkway
                                 Irvine, CA
                                   92618

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 Problem Descriptions:
  REDLANDS
  NODE 20970 TO NODE 20971
  APR 2014 DMALOTT
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =    2.37
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.075
    LOW LOSS FRACTION = 0.930
    TIME OF CONCENTRATION(MIN.) =  8.17
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.46
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.95
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.25
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.03
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  2.75
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.50

------------------------------------------------------------------------------

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     0.65
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     0.43

******************************************************************************
  TIME     VOLUME       Q    0.        2.5       5.0       7.5      10.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.07      0.0002      0.08  Q         .         .         .         .
  0.20      0.0012      0.08  Q         .         .         .         .
  0.34      0.0022      0.09  Q         .         .         .         .
  0.48      0.0031      0.09  Q         .         .         .         .
  0.61      0.0041      0.09  Q         .         .         .         .
  0.75      0.0051      0.09  Q         .         .         .         .
  0.89      0.0061      0.09  Q         .         .         .         .
  1.02      0.0072      0.09  Q         .         .         .         .
  1.16      0.0082      0.09  Q         .         .         .         .
  1.29      0.0092      0.09  Q         .         .         .         .
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  1.43      0.0103      0.10  Q         .         .         .         .
  1.57      0.0114      0.10  Q         .         .         .         .
  1.70      0.0125      0.10  Q         .         .         .         .
  1.84      0.0136      0.10  Q         .         .         .         .
  1.97      0.0147      0.10  Q         .         .         .         .
  2.11      0.0158      0.10  Q         .         .         .         .
  2.25      0.0170      0.10  Q         .         .         .         .
  2.38      0.0181      0.10  Q         .         .         .         .
  2.52      0.0193      0.11  Q         .         .         .         .
  2.66      0.0205      0.11  Q         .         .         .         .
  2.79      0.0217      0.11  Q         .         .         .         .
  2.93      0.0229      0.11  Q         .         .         .         .
  3.06      0.0242      0.11  Q         .         .         .         .
  3.20      0.0254      0.11  Q         .         .         .         .
  3.34      0.0267      0.11  Q         .         .         .         .
  3.47      0.0280      0.11  Q         .         .         .         .
  3.61      0.0293      0.12  Q         .         .         .         .
  3.74      0.0306      0.12  Q         .         .         .         .
  3.88      0.0319      0.12  Q         .         .         .         .
  4.02      0.0333      0.12  Q         .         .         .         .
  4.15      0.0347      0.12  Q         .         .         .         .
  4.29      0.0361      0.12  Q         .         .         .         .
  4.43      0.0375      0.13  Q         .         .         .         .
  4.56      0.0389      0.13  Q         .         .         .         .
  4.70      0.0403      0.13  Q         .         .         .         .
  4.83      0.0418      0.13  Q         .         .         .         .
  4.97      0.0433      0.13  Q         .         .         .         .
  5.11      0.0448      0.13  Q         .         .         .         .
  5.24      0.0463      0.14  Q         .         .         .         .
  5.38      0.0479      0.14  Q         .         .         .         .
  5.52      0.0494      0.14  Q         .         .         .         .
  5.65      0.0510      0.14  Q         .         .         .         .
  5.79      0.0526      0.14  Q         .         .         .         .
  5.92      0.0543      0.15  Q         .         .         .         .
  6.06      0.0559      0.15  Q         .         .         .         .
  6.20      0.0576      0.15  Q         .         .         .         .
  6.33      0.0593      0.15  Q         .         .         .         .
  6.47      0.0611      0.15  Q         .         .         .         .
  6.60      0.0628      0.16  Q         .         .         .         .
  6.74      0.0646      0.16  Q         .         .         .         .
  6.88      0.0664      0.16  Q         .         .         .         .
  7.01      0.0682      0.16  Q         .         .         .         .
  7.15      0.0701      0.17  Q         .         .         .         .
  7.29      0.0720      0.17  Q         .         .         .         .
  7.42      0.0739      0.17  Q         .         .         .         .
  7.56      0.0758      0.17  Q         .         .         .         .
  7.69      0.0778      0.18  Q         .         .         .         .
  7.83      0.0798      0.18  Q         .         .         .         .
  7.97      0.0819      0.18  Q         .         .         .         .
  8.10      0.0839      0.18  Q         .         .         .         .
  8.24      0.0860      0.19  Q         .         .         .         .
  8.37      0.0882      0.19  Q         .         .         .         .
  8.51      0.0903      0.20  Q         .         .         .         .
  8.65      0.0926      0.20  Q         .         .         .         .
  8.78      0.0948      0.20  Q         .         .         .         .
  8.92      0.0971      0.20  Q         .         .         .         .
  9.06      0.0994      0.21  Q         .         .         .         .
  9.19      0.1018      0.21  Q         .         .         .         .
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9.33	0.1042	0.22	Q
9.46	0.1066	0.22	Q
9.60	0.1091	0.22	Q
9.74	0.1116	0.23	Q
9.87	0.1142	0.23	Q
10.01	0.1168	0.23	Q
10.14	0.1195	0.24	Q
10.28	0.1222	0.24	Q
10.42	0.1250	0.25	.Q
10.55	0.1279	0.25	.Q
10.69	0.1308	0.26	.Q
10.83	0.1337	0.26	.Q
10.96	0.1367	0.27	.Q
11.10	0.1398	0.28	.Q
11.23	0.1430	0.28	.Q
11.37	0.1462	0.29	.Q
11.51	0.1495	0.30	.Q
11.64	0.1528	0.30	.Q
11.78	0.1563	0.31	.Q
11.91	0.1598	0.32	.Q
12.05	0.1634	0.32	.Q
12.19	0.1667	0.27	.Q
12.32	0.1698	0.28	.Q
12.46	0.1731	0.29	.Q
12.60	0.1764	0.30	.Q
12.73	0.1798	0.31	.Q
12.87	0.1834	0.32	.Q
13.00	0.1871	0.33	.Q
13.14	0.1909	0.35	.Q
13.28	0.1949	0.36	.Q
13.41	0.1990	0.38	.Q
13.55	0.2033	0.39	.Q
13.69	0.2078	0.41	.Q
13.82	0.2124	0.42	.Q
13.96	0.2174	0.45	.Q
14.09	0.2225	0.46	.Q
14.23	0.2279	0.50	. Q
14.37	0.2337	0.52	. Q
14.50	0.2398	0.56	. Q
14.64	0.2463	0.59	. Q
14.77	0.2533	0.64	. Q
14.91	0.2607	0.68	. Q
15.05	0.2688	0.76	. Q
15.18	0.2776	0.80	. Q
15.32	0.2873	0.93	. Q
15.46	0.2979	0.96	. Q
15.59	0.3095	1.10	. Q
15.73	0.3228	1.26	. Q
15.86	0.3407	1.92	. Q
16.00	0.3666	2.69	. Q
16.14	0.4302	8.63	. Q
16.27	0.4874	1.52	. Q
16.41	0.5014	0.98	. Q
16.54	0.5118	0.86	. Q
16.68	0.5206	0.71	. Q
16.82	0.5281	0.62	. Q
16.95	0.5346	0.54	. Q
17.09	0.5404	0.49	.Q

17.23	0.5456	0.44	.Q
17.36	0.5503	0.40	.Q
17.50	0.5546	0.37	.Q
17.63	0.5586	0.34	.Q
17.77	0.5622	0.32	.Q
17.91	0.5657	0.30	.Q
18.04	0.5689	0.28	.Q
18.18	0.5723	0.32	.Q
18.31	0.5758	0.31	.Q
18.45	0.5792	0.29	.Q
18.59	0.5824	0.28	.Q
18.72	0.5855	0.27	.Q
18.86	0.5884	0.26	.Q
19.00	0.5912	0.25	Q
19.13	0.5940	0.24	Q
19.27	0.5966	0.23	Q
19.40	0.5991	0.22	Q
19.54	0.6016	0.21	Q
19.68	0.6039	0.21	Q
19.81	0.6062	0.20	Q
19.95	0.6084	0.19	Q
20.08	0.6106	0.19	Q
20.22	0.6126	0.18	Q
20.36	0.6147	0.18	Q
20.49	0.6166	0.17	Q
20.63	0.6185	0.17	Q
20.77	0.6203	0.16	Q
20.90	0.6221	0.16	Q
21.04	0.6238	0.15	Q
21.17	0.6255	0.15	Q
21.31	0.6271	0.14	Q
21.45	0.6287	0.14	Q
21.58	0.6303	0.14	Q
21.72	0.6318	0.13	Q
21.86	0.6333	0.13	Q
21.99	0.6347	0.13	Q
22.13	0.6361	0.12	Q
22.26	0.6374	0.12	Q
22.40	0.6387	0.12	Q
22.54	0.6400	0.11	Q
22.67	0.6413	0.11	Q
22.81	0.6425	0.11	Q
22.94	0.6437	0.10	Q
23.08	0.6449	0.10	Q
23.22	0.6460	0.10	Q
23.35	0.6471	0.10	Q
23.49	0.6482	0.09	Q
23.63	0.6492	0.09	Q
23.76	0.6503	0.09	Q
23.90	0.6513	0.09	Q
24.03	0.6522	0.09	Q
24.17	0.6527	0.00	Q

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1446.1
10%	73.5
20%	24.5
30%	16.3
40%	8.2
50%	8.2
60%	8.2
70%	8.2
80%	8.2
90%	8.2

```
______________________________________________________________________________
******************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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                          Analysis prepared by:

                              RBF Consulting
                            14257 Alton Parkway
                                 Irvine, CA
                                   92618

******************************************************************************
------------------------------------------------------------------------------

 Problem Descriptions:
  REDLANDS
  NODE 20972.5 TO NODE 20972
  APR 2014 DMALOTT
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =    3.23
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.086
    LOW LOSS FRACTION = 0.990
    TIME OF CONCENTRATION(MIN.) =  9.36
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.46
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.95
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.25
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.03
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  2.75
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.50

------------------------------------------------------------------------------

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     0.83
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     0.65

******************************************************************************
  TIME     VOLUME       Q    0.        5.0      10.0      15.0      20.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.09      0.0000      0.00  Q         .         .         .         .
  0.24      0.0005      0.08  Q         .         .         .         .
  0.40      0.0016      0.09  Q         .         .         .         .
  0.56      0.0028      0.09  Q         .         .         .         .
  0.71      0.0039      0.09  Q         .         .         .         .
  0.87      0.0051      0.09  Q         .         .         .         .
  1.02      0.0062      0.09  Q         .         .         .         .
  1.18      0.0075      0.09  Q         .         .         .         .
  1.34      0.0087      0.10  Q         .         .         .         .
  1.49      0.0099      0.10  Q         .         .         .         .
```



```
  1.65      0.0112      0.10  Q         .         .         .         .
  1.80      0.0125      0.10  Q         .         .         .         .
  1.96      0.0139      0.10  Q         .         .         .         .
  2.12      0.0152      0.11  Q         .         .         .         .
  2.27      0.0166      0.11  Q         .         .         .         .
  2.43      0.0180      0.11  Q         .         .         .         .
  2.58      0.0194      0.11  Q         .         .         .         .
  2.74      0.0209      0.11  Q         .         .         .         .
  2.90      0.0224      0.12  Q         .         .         .         .
  3.05      0.0239      0.12  Q         .         .         .         .
  3.21      0.0254      0.12  Q         .         .         .         .
  3.36      0.0270      0.12  Q         .         .         .         .
  3.52      0.0286      0.12  Q         .         .         .         .
  3.68      0.0302      0.13  Q         .         .         .         .
  3.83      0.0319      0.13  Q         .         .         .         .
  3.99      0.0336      0.13  Q         .         .         .         .
  4.14      0.0353      0.13  Q         .         .         .         .
  4.30      0.0370      0.14  Q         .         .         .         .
  4.46      0.0388      0.14  Q         .         .         .         .
  4.61      0.0407      0.14  Q         .         .         .         .
  4.77      0.0425      0.14  Q         .         .         .         .
  4.92      0.0444      0.15  Q         .         .         .         .
  5.08      0.0463      0.15  Q         .         .         .         .
  5.24      0.0483      0.15  Q         .         .         .         .
  5.39      0.0503      0.16  Q         .         .         .         .
  5.55      0.0523      0.16  Q         .         .         .         .
  5.70      0.0544      0.16  Q         .         .         .         .
  5.86      0.0565      0.17  Q         .         .         .         .
  6.02      0.0587      0.17  Q         .         .         .         .
  6.17      0.0609      0.17  Q         .         .         .         .
  6.33      0.0631      0.17  Q         .         .         .         .
  6.48      0.0654      0.18  Q         .         .         .         .
  6.64      0.0677      0.18  Q         .         .         .         .
  6.80      0.0701      0.19  Q         .         .         .         .
  6.95      0.0725      0.19  Q         .         .         .         .
  7.11      0.0750      0.19  Q         .         .         .         .
  7.26      0.0775      0.20  Q         .         .         .         .
  7.42      0.0801      0.20  Q         .         .         .         .
  7.58      0.0827      0.20  Q         .         .         .         .
  7.73      0.0854      0.21  Q         .         .         .         .
  7.89      0.0881      0.21  Q         .         .         .         .
  8.04      0.0909      0.22  Q         .         .         .         .
  8.20      0.0938      0.22  Q         .         .         .         .
  8.36      0.0967      0.23  Q         .         .         .         .
  8.51      0.0996      0.23  Q         .         .         .         .
  8.67      0.1027      0.24  Q         .         .         .         .
  8.82      0.1058      0.24  Q         .         .         .         .
  8.98      0.1089      0.25  Q         .         .         .         .
  9.14      0.1122      0.25  Q         .         .         .         .
  9.29      0.1155      0.26  Q         .         .         .         .
  9.45      0.1189      0.26  Q         .         .         .         .
  9.60      0.1223      0.27  Q         .         .         .         .
  9.76      0.1259      0.28  Q         .         .         .         .
  9.92      0.1295      0.29  Q         .         .         .         .
 10.07      0.1332      0.29  Q         .         .         .         .
 10.23      0.1370      0.30  Q         .         .         .         .
 10.38      0.1409      0.30  Q         .         .         .         .
 10.54      0.1449      0.31  Q         .         .         .         .
```

10.70	0.1490	0.32	Q	.	.	.	.
10.85	0.1532	0.33	Q	.	.	.	.
11.01	0.1575	0.34	Q	.	.	.	.
11.16	0.1619	0.35	Q	.	.	.	.
11.32	0.1665	0.36	Q	.	.	.	.
11.48	0.1712	0.37	Q	.	.	.	.
11.63	0.1760	0.38	Q	.	.	.	.
11.79	0.1809	0.39	Q	.	.	.	.
11.94	0.1860	0.40	Q	.	.	.	.
12.10	0.1910	0.38	Q	.	.	.	.
12.26	0.1957	0.34	Q	.	.	.	.
12.41	0.2002	0.36	Q	.	.	.	.
12.57	0.2049	0.37	Q	.	.	.	.
12.72	0.2098	0.39	Q	.	.	.	.
12.88	0.2149	0.40	Q	.	.	.	.
13.04	0.2203	0.43	Q	.	.	.	.
13.19	0.2259	0.44	Q	.	.	.	.
13.35	0.2317	0.47	Q	.	.	.	.
13.50	0.2379	0.49	Q	.	.	.	.
13.66	0.2444	0.52	.Q	.	.	.	.
13.82	0.2512	0.54	.Q	.	.	.	.
13.97	0.2584	0.58	.Q	.	.	.	.
14.13	0.2661	0.61	.Q	.	.	.	.
14.28	0.2743	0.67	.Q	.	.	.	.
14.44	0.2830	0.70	.Q	.	.	.	.
14.60	0.2925	0.77	.Q	.	.	.	.
14.75	0.3026	0.81	.Q	.	.	.	.
14.91	0.3137	0.91	.Q	.	.	.	.
15.06	0.3258	0.97	.Q	.	.	.	.
15.22	0.3392	1.12	. Q	.	.	.	.
15.38	0.3543	1.22	. Q	.	.	.	.
15.53	0.3708	1.33	. Q	.	.	.	.
15.69	0.3892	1.54	. Q	.	.	.	.
15.84	0.4143	2.36	. Q	.	.	.	.
16.00	0.4510	3.33	. Q	.	.	.	.
16.16	0.5421	10.80	.	.	.Q	.	.
16.31	0.6235	1.84	. Q	.	.	.	.
16.47	0.6436	1.27	. Q	.	.	.	.
16.62	0.6585	1.04	. Q	.	.	.	.
16.78	0.6707	0.85	.Q	.	.	.	.
16.94	0.6809	0.73	.Q	.	.	.	.
17.09	0.6897	0.64	.Q	.	.	.	.
17.25	0.6975	0.56	.Q	.	.	.	.
17.40	0.7043	0.50	.Q	.	.	.	.
17.56	0.7105	0.45	Q	.	.	.	.
17.72	0.7161	0.41	Q	.	.	.	.
17.87	0.7212	0.38	Q	.	.	.	.
18.03	0.7259	0.35	Q	.	.	.	.
18.18	0.7308	0.41	Q	.	.	.	.
18.34	0.7359	0.38	Q	.	.	.	.
18.50	0.7407	0.36	Q	.	.	.	.
18.65	0.7453	0.34	Q	.	.	.	.
18.81	0.7496	0.33	Q	.	.	.	.
18.96	0.7537	0.31	Q	.	.	.	.
19.12	0.7576	0.29	Q	.	.	.	.
19.28	0.7613	0.28	Q	.	.	.	.
19.43	0.7648	0.27	Q	.	.	.	.
19.59	0.7682	0.26	Q	.	.	.	.

19.74	0.7714	0.25	Q	.	.	.	.
19.90	0.7745	0.24	Q	.	.	.	.
20.06	0.7775	0.23	Q	.	.	.	.
20.21	0.7804	0.22	Q	.	.	.	.
20.37	0.7831	0.21	Q	.	.	.	.
20.52	0.7857	0.20	Q	.	.	.	.
20.68	0.7882	0.19	Q	.	.	.	.
20.84	0.7907	0.18	Q	.	.	.	.
20.99	0.7930	0.18	Q	.	.	.	.
21.15	0.7952	0.17	Q	.	.	.	.
21.30	0.7974	0.16	Q	.	.	.	.
21.46	0.7995	0.16	Q	.	.	.	.
21.62	0.8015	0.15	Q	.	.	.	.
21.77	0.8034	0.15	Q	.	.	.	.
21.93	0.8052	0.14	Q	.	.	.	.
22.08	0.8070	0.14	Q	.	.	.	.
22.24	0.8088	0.13	Q	.	.	.	.
22.40	0.8104	0.13	Q	.	.	.	.
22.55	0.8120	0.12	Q	.	.	.	.
22.71	0.8136	0.12	Q	.	.	.	.
22.86	0.8150	0.11	Q	.	.	.	.
23.02	0.8165	0.11	Q	.	.	.	.
23.18	0.8179	0.10	Q	.	.	.	.
23.33	0.8192	0.10	Q	.	.	.	.
23.49	0.8205	0.10	Q	.	.	.	.
23.64	0.8217	0.09	Q	.	.	.	.
23.80	0.8229	0.09	Q	.	.	.	.
23.96	0.8240	0.09	Q	.	.	.	.
24.11	0.8251	0.08	Q	.	.	.	.
24.27	0.8257	0.00	Q	.	.	.	.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1441.4
10%	84.2
20%	28.1
30%	18.7
40%	9.4
50%	9.4
60%	9.4
70%	9.4
80%	9.4
90%	9.4

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******************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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                          Analysis prepared by:

                              RBF Consulting
                            14257 Alton Parkway
                                 Irvine, CA
                                   92618

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 Problem Descriptions:
  REDLANDS
  NODE 20973.5 TO NODE 20973
  APR 2014 DMALOTT
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =    3.61
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.075
    LOW LOSS FRACTION = 0.930
    TIME OF CONCENTRATION(MIN.) =  9.07
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.46
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.95
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.25
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.03
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  2.75
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.50

------------------------------------------------------------------------------

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     0.99
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     0.66

******************************************************************************
  TIME     VOLUME       Q    0.        5.0      10.0      15.0      20.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.13      0.0007      0.13  Q         .         .         .         .
  0.28      0.0023      0.13  Q         .         .         .         .
  0.43      0.0039      0.13  Q         .         .         .         .
  0.58      0.0056      0.13  Q         .         .         .         .
  0.73      0.0073      0.14  Q         .         .         .         .
  0.88      0.0090      0.14  Q         .         .         .         .
  1.03      0.0107      0.14  Q         .         .         .         .
  1.19      0.0125      0.14  Q         .         .         .         .
  1.34      0.0143      0.14  Q         .         .         .         .
  1.49      0.0161      0.15  Q         .         .         .         .
```



```
  1.64      0.0179      0.15  Q         .         .         .         .
  1.79      0.0198      0.15  Q         .         .         .         .
  1.94      0.0216      0.15  Q         .         .         .         .
  2.09      0.0236      0.15  Q         .         .         .         .
  2.24      0.0255      0.16  Q         .         .         .         .
  2.40      0.0274      0.16  Q         .         .         .         .
  2.55      0.0294      0.16  Q         .         .         .         .
  2.70      0.0315      0.16  Q         .         .         .         .
  2.85      0.0335      0.17  Q         .         .         .         .
  3.00      0.0356      0.17  Q         .         .         .         .
  3.15      0.0377      0.17  Q         .         .         .         .
  3.30      0.0398      0.17  Q         .         .         .         .
  3.45      0.0420      0.18  Q         .         .         .         .
  3.60      0.0442      0.18  Q         .         .         .         .
  3.76      0.0464      0.18  Q         .         .         .         .
  3.91      0.0487      0.18  Q         .         .         .         .
  4.06      0.0510      0.19  Q         .         .         .         .
  4.21      0.0533      0.19  Q         .         .         .         .
  4.36      0.0557      0.19  Q         .         .         .         .
  4.51      0.0581      0.19  Q         .         .         .         .
  4.66      0.0605      0.20  Q         .         .         .         .
  4.81      0.0630      0.20  Q         .         .         .         .
  4.96      0.0655      0.20  Q         .         .         .         .
  5.12      0.0680      0.20  Q         .         .         .         .
  5.27      0.0706      0.21  Q         .         .         .         .
  5.42      0.0732      0.21  Q         .         .         .         .
  5.57      0.0759      0.22  Q         .         .         .         .
  5.72      0.0786      0.22  Q         .         .         .         .
  5.87      0.0813      0.22  Q         .         .         .         .
  6.02      0.0841      0.22  Q         .         .         .         .
  6.17      0.0869      0.23  Q         .         .         .         .
  6.33      0.0898      0.23  Q         .         .         .         .
  6.48      0.0927      0.24  Q         .         .         .         .
  6.63      0.0957      0.24  Q         .         .         .         .
  6.78      0.0987      0.24  Q         .         .         .         .
  6.93      0.1018      0.25  Q         .         .         .         .
  7.08      0.1049      0.25  Q         .         .         .         .
  7.23      0.1081      0.25  Q         .         .         .         .
  7.38      0.1113      0.26  Q         .         .         .         .
  7.53      0.1146      0.26  Q         .         .         .         .
  7.69      0.1179      0.27  Q         .         .         .         .
  7.84      0.1213      0.27  Q         .         .         .         .
  7.99      0.1247      0.28  Q         .         .         .         .
  8.14      0.1282      0.28  Q         .         .         .         .
  8.29      0.1318      0.29  Q         .         .         .         .
  8.44      0.1354      0.29  Q         .         .         .         .
  8.59      0.1391      0.30  Q         .         .         .         .
  8.74      0.1429      0.30  Q         .         .         .         .
  8.90      0.1468      0.31  Q         .         .         .         .
  9.05      0.1507      0.31  Q         .         .         .         .
  9.20      0.1546      0.32  Q         .         .         .         .
  9.35      0.1587      0.33  Q         .         .         .         .
  9.50      0.1629      0.34  Q         .         .         .         .
  9.65      0.1671      0.34  Q         .         .         .         .
  9.80      0.1714      0.35  Q         .         .         .         .
  9.95      0.1758      0.35  Q         .         .         .         .
 10.10      0.1803      0.36  Q         .         .         .         .
 10.26      0.1849      0.37  Q         .         .         .         .
```

10.41	0.1895	0.38	Q	.	.	.	.	
10.56	0.1943	0.39	Q	.	.	.	.	
10.71	0.1992	0.40	Q	.	.	.	.	
10.86	0.2042	0.40	Q	.	.	.	.	
11.01	0.2094	0.42	Q	.	.	.	.	
11.16	0.2146	0.42	Q	.	.	.	.	
11.31	0.2200	0.44	Q	.	.	.	.	
11.47	0.2255	0.44	Q	.	.	.	.	
11.62	0.2311	0.46	Q	.	.	.	.	
11.77	0.2369	0.47	Q	.	.	.	.	
11.92	0.2429	0.48	Q	.	.	.	.	
12.07	0.2490	0.49	Q	.	.	.	.	
12.22	0.2547	0.42	Q	.	.	.	.	
12.37	0.2600	0.43	Q	.	.	.	.	
12.52	0.2655	0.45	Q	.	.	.	.	
12.67	0.2712	0.46	Q	.	.	.	.	
12.83	0.2771	0.49	Q	.	.	.	.	
12.98	0.2833	0.50	Q	.	.	.	.	
13.13	0.2897	0.53	.Q	.	.	.	.	
13.28	0.2963	0.54	.Q	.	.	.	.	
13.43	0.3033	0.57	.Q	.	.	.	.	
13.58	0.3106	0.59	.Q	.	.	.	.	
13.73	0.3183	0.63	.Q	.	.	.	.	
13.88	0.3263	0.65	.Q	.	.	.	.	
14.03	0.3348	0.70	.Q	.	.	.	.	
14.19	0.3437	0.74	.Q	.	.	.	.	
14.34	0.3533	0.80	.Q	.	.	.	.	
14.49	0.3635	0.83	.Q	.	.	.	.	
14.64	0.3744	0.91	.Q	.	.	.	.	
14.79	0.3861	0.96	.Q	.	.	.	.	
14.94	0.3988	1.07	. Q	.	.	.	.	
15.09	0.4126	1.14	. Q	.	.	.	.	
15.24	0.4280	1.32	. Q	.	.	.	.	
15.40	0.4451	1.43	. Q	.	.	.	.	
15.55	0.4638	1.56	. Q	.	.	.	.	
15.70	0.4847	1.79	. Q	.	.	.	.	
15.85	0.5129	2.73	. Q	.	.	.	.	
16.00	0.5538	3.83	. Q	.	.	.	.	
16.15	0.6548	12.34	.	.	.	Q	.	
16.30	0.7453	2.14	. Q	.	.	.	.	
16.45	0.7678	1.45	. Q	.	.	.	.	
16.60	0.7845	1.22	. Q	.	.	.	.	
16.76	0.7984	1.01	. Q	.	.	.	.	
16.91	0.8102	0.87	.Q	.	.	.	.	
17.06	0.8204	0.77	.Q	.	.	.	.	
17.21	0.8294	0.68	.Q	.	.	.	.	
17.36	0.8375	0.61	.Q	.	.	.	.	
17.51	0.8448	0.56	.Q	.	.	.	.	
17.66	0.8515	0.51	.Q	.	.	.	.	
17.81	0.8576	0.47	Q	.	.	.	.	
17.97	0.8633	0.44	Q	.	.	.	.	
18.12	0.8688	0.44	Q	.	.	.	.	
18.27	0.8745	0.48	Q	.	.	.	.	
18.42	0.8803	0.45	Q	.	.	.	.	
18.57	0.8858	0.43	Q	.	.	.	.	
18.72	0.8911	0.41	Q	.	.	.	.	
18.87	0.8961	0.39	Q	.	.	.	.	
19.02	0.9009	0.37	Q	.	.	.	.	

19.17	0.9055	0.36	Q	.	.	.	.	
19.33	0.9099	0.34	Q	.	.	.	.	
19.48	0.9141	0.33	Q	.	.	.	.	
19.63	0.9182	0.32	Q	.	.	.	.	
19.78	0.9221	0.31	Q	.	.	.	.	
19.93	0.9258	0.30	Q	.	.	.	.	
20.08	0.9295	0.29	Q	.	.	.	.	
20.23	0.9330	0.28	Q	.	.	.	.	
20.38	0.9364	0.27	Q	.	.	.	.	
20.53	0.9396	0.26	Q	.	.	.	.	
20.69	0.9428	0.25	Q	.	.	.	.	
20.84	0.9459	0.24	Q	.	.	.	.	
20.99	0.9488	0.23	Q	.	.	.	.	
21.14	0.9517	0.23	Q	.	.	.	.	
21.29	0.9545	0.22	Q	.	.	.	.	
21.44	0.9572	0.21	Q	.	.	.	.	
21.59	0.9598	0.21	Q	.	.	.	.	
21.74	0.9624	0.20	Q	.	.	.	.	
21.90	0.9648	0.19	Q	.	.	.	.	
22.05	0.9672	0.19	Q	.	.	.	.	
22.20	0.9696	0.18	Q	.	.	.	.	
22.35	0.9718	0.18	Q	.	.	.	.	
22.50	0.9740	0.17	Q	.	.	.	.	
22.65	0.9762	0.17	Q	.	.	.	.	
22.80	0.9782	0.16	Q	.	.	.	.	
22.95	0.9803	0.16	Q	.	.	.	.	
23.10	0.9822	0.15	Q	.	.	.	.	
23.26	0.9841	0.15	Q	.	.	.	.	
23.41	0.9860	0.15	Q	.	.	.	.	
23.56	0.9878	0.14	Q	.	.	.	.	
23.71	0.9896	0.14	Q	.	.	.	.	
23.86	0.9913	0.13	Q	.	.	.	.	
24.01	0.9929	0.13	Q	.	.	.	.	
24.16	0.9937	0.00	Q	.	.	.	.	

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1442.1
10%	81.6
20%	27.2
30%	18.1
40%	9.1
50%	9.1
60%	9.1
70%	9.1
80%	9.1
90%	9.1

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******************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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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

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 Problem Descriptions:
  REDLANDS
  NODE 20974.5 TO NODE 20974
  APR 2014 DMALOTT
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =    3.67
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.075
    LOW LOSS FRACTION = 0.930
    TIME OF CONCENTRATION(MIN.) =  9.31
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.46
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.95
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.25
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.03
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  2.75
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.50

------------------------------------------------------------------------------

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     1.01
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     0.67

******************************************************************************
  TIME     VOLUME       Q    0.        5.0      10.0      15.0      20.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.02      0.0000      0.00  Q         .         .         .         .
  0.17      0.0008      0.13  Q         .         .         .         .
  0.33      0.0025      0.13  Q         .         .         .         .
  0.48      0.0043      0.13  Q         .         .         .         .
  0.64      0.0060      0.14  Q         .         .         .         .
  0.79      0.0078      0.14  Q         .         .         .         .
  0.95      0.0096      0.14  Q         .         .         .         .
  1.10      0.0114      0.14  Q         .         .         .         .
  1.26      0.0132      0.15  Q         .         .         .         .
  1.41      0.0151      0.15  Q         .         .         .         .
```



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  1.57      0.0170      0.15  Q         .         .         .         .
  1.72      0.0189      0.15  Q         .         .         .         .
  1.88      0.0209      0.15  Q         .         .         .         .
  2.03      0.0229      0.16  Q         .         .         .         .
  2.19      0.0249      0.16  Q         .         .         .         .
  2.35      0.0269      0.16  Q         .         .         .         .
  2.50      0.0290      0.16  Q         .         .         .         .
  2.66      0.0311      0.16  Q         .         .         .         .
  2.81      0.0332      0.17  Q         .         .         .         .
  2.97      0.0353      0.17  Q         .         .         .         .
  3.12      0.0375      0.17  Q         .         .         .         .
  3.28      0.0398      0.17  Q         .         .         .         .
  3.43      0.0420      0.18  Q         .         .         .         .
  3.59      0.0443      0.18  Q         .         .         .         .
  3.74      0.0466      0.18  Q         .         .         .         .
  3.90      0.0490      0.18  Q         .         .         .         .
  4.05      0.0514      0.19  Q         .         .         .         .
  4.21      0.0538      0.19  Q         .         .         .         .
  4.36      0.0563      0.19  Q         .         .         .         .
  4.52      0.0588      0.20  Q         .         .         .         .
  4.67      0.0613      0.20  Q         .         .         .         .
  4.83      0.0639      0.20  Q         .         .         .         .
  4.98      0.0665      0.21  Q         .         .         .         .
  5.14      0.0692      0.21  Q         .         .         .         .
  5.29      0.0719      0.21  Q         .         .         .         .
  5.45      0.0746      0.21  Q         .         .         .         .
  5.60      0.0774      0.22  Q         .         .         .         .
  5.76      0.0802      0.22  Q         .         .         .         .
  5.91      0.0831      0.23  Q         .         .         .         .
  6.07      0.0860      0.23  Q         .         .         .         .
  6.22      0.0890      0.23  Q         .         .         .         .
  6.38      0.0920      0.24  Q         .         .         .         .
  6.53      0.0951      0.24  Q         .         .         .         .
  6.69      0.0982      0.24  Q         .         .         .         .
  6.85      0.1013      0.25  Q         .         .         .         .
  7.00      0.1046      0.25  Q         .         .         .         .
  7.16      0.1078      0.26  Q         .         .         .         .
  7.31      0.1112      0.26  Q         .         .         .         .
  7.47      0.1146      0.27  Q         .         .         .         .
  7.62      0.1180      0.27  Q         .         .         .         .
  7.78      0.1215      0.28  Q         .         .         .         .
  7.93      0.1251      0.28  Q         .         .         .         .
  8.09      0.1287      0.29  Q         .         .         .         .
  8.24      0.1324      0.29  Q         .         .         .         .
  8.40      0.1362      0.30  Q         .         .         .         .
  8.55      0.1400      0.30  Q         .         .         .         .
  8.71      0.1440      0.31  Q         .         .         .         .
  8.86      0.1479      0.31  Q         .         .         .         .
  9.02      0.1520      0.32  Q         .         .         .         .
  9.17      0.1562      0.33  Q         .         .         .         .
  9.33      0.1604      0.33  Q         .         .         .         .
  9.48      0.1647      0.34  Q         .         .         .         .
  9.64      0.1691      0.35  Q         .         .         .         .
  9.79      0.1736      0.35  Q         .         .         .         .
  9.95      0.1782      0.36  Q         .         .         .         .
 10.10      0.1828      0.37  Q         .         .         .         .
 10.26      0.1876      0.38  Q         .         .         .         .
 10.41      0.1925      0.38  Q         .         .         .         .
```

10.57	0.1975	0.40	Q	.	.	.	.	
10.72	0.2026	0.40	Q	.	.	.	.	
10.88	0.2079	0.41	Q	.	.	.	.	
11.03	0.2132	0.42	Q	.	.	.	.	
11.19	0.2187	0.44	Q	.	.	.	.	
11.35	0.2243	0.44	Q	.	.	.	.	
11.50	0.2301	0.46	Q	.	.	.	.	
11.66	0.2360	0.47	Q	.	.	.	.	
11.81	0.2421	0.48	Q	.	.	.	.	
11.97	0.2484	0.49	Q	.	.	.	.	
12.12	0.2544	0.45	Q	.	.	.	.	
12.28	0.2600	0.43	Q	.	.	.	.	
12.43	0.2656	0.45	Q	.	.	.	.	
12.59	0.2714	0.46	Q	.	.	.	.	
12.74	0.2775	0.48	Q	.	.	.	.	
12.90	0.2838	0.50	Q	.	.	.	.	
13.05	0.2903	0.52	.Q	.	.	.	.	
13.21	0.2971	0.54	.Q	.	.	.	.	
13.36	0.3043	0.57	.Q	.	.	.	.	
13.52	0.3117	0.59	.Q	.	.	.	.	
13.67	0.3195	0.63	.Q	.	.	.	.	
13.83	0.3277	0.65	.Q	.	.	.	.	
13.98	0.3364	0.70	.Q	.	.	.	.	
14.14	0.3456	0.73	.Q	.	.	.	.	
14.29	0.3553	0.80	.Q	.	.	.	.	
14.45	0.3658	0.83	.Q	.	.	.	.	
14.60	0.3769	0.91	.Q	.	.	.	.	
14.76	0.3889	0.96	.Q	.	.	.	.	
14.91	0.4019	1.07	. Q	.	.	.	.	
15.07	0.4161	1.14	. Q	.	.	.	.	
15.22	0.4318	1.31	. Q	.	.	.	.	
15.38	0.4494	1.43	. Q	.	.	.	.	
15.53	0.4685	1.55	. Q	.	.	.	.	
15.69	0.4900	1.79	. Q	.	.	.	.	
15.84	0.5189	2.73	. Q	.	.	.	.	
16.00	0.5609	3.83	. Q	.	.	.	.	
16.16	0.6647	12.35	.	.	.	Q	.	
16.31	0.7575	2.14	. Q	.	.	.	.	
16.47	0.7807	1.48	. Q	.	.	.	.	
16.62	0.7981	1.22	. Q	.	.	.	.	
16.78	0.8124	1.01	. Q	.	.	.	.	
16.93	0.8244	0.87	.Q	.	.	.	.	
17.09	0.8349	0.76	.Q	.	.	.	.	
17.24	0.8441	0.67	.Q	.	.	.	.	
17.40	0.8523	0.61	.Q	.	.	.	.	
17.55	0.8598	0.56	.Q	.	.	.	.	
17.71	0.8666	0.51	.Q	.	.	.	.	
17.86	0.8729	0.47	Q	.	.	.	.	
18.02	0.8787	0.44	Q	.	.	.	.	
18.17	0.8848	0.50	.Q	.	.	.	.	
18.33	0.8910	0.47	Q	.	.	.	.	
18.48	0.8969	0.45	Q	.	.	.	.	
18.64	0.9026	0.43	Q	.	.	.	.	
18.79	0.9079	0.41	Q	.	.	.	.	
18.95	0.9130	0.39	Q	.	.	.	.	
19.10	0.9179	0.37	Q	.	.	.	.	
19.26	0.9226	0.36	Q	.	.	.	.	
19.41	0.9271	0.34	Q	.	.	.	.	

19.57	0.9314	0.33	Q	.	.	.	.	
19.72	0.9356	0.32	Q	.	.	.	.	
19.88	0.9396	0.31	Q	.	.	.	.	
20.03	0.9434	0.29	Q	.	.	.	.	
20.19	0.9471	0.28	Q	.	.	.	.	
20.34	0.9507	0.27	Q	.	.	.	.	
20.50	0.9541	0.26	Q	.	.	.	.	
20.66	0.9575	0.26	Q	.	.	.	.	
20.81	0.9607	0.25	Q	.	.	.	.	
20.97	0.9638	0.24	Q	.	.	.	.	
21.12	0.9668	0.23	Q	.	.	.	.	
21.28	0.9697	0.22	Q	.	.	.	.	
21.43	0.9726	0.22	Q	.	.	.	.	
21.59	0.9753	0.21	Q	.	.	.	.	
21.74	0.9780	0.20	Q	.	.	.	.	
21.90	0.9805	0.20	Q	.	.	.	.	
22.05	0.9830	0.19	Q	.	.	.	.	
22.21	0.9855	0.19	Q	.	.	.	.	
22.36	0.9878	0.18	Q	.	.	.	.	
22.52	0.9901	0.18	Q	.	.	.	.	
22.67	0.9923	0.17	Q	.	.	.	.	
22.83	0.9945	0.17	Q	.	.	.	.	
22.98	0.9966	0.16	Q	.	.	.	.	
23.14	0.9986	0.16	Q	.	.	.	.	
23.29	1.0006	0.15	Q	.	.	.	.	
23.45	1.0025	0.15	Q	.	.	.	.	
23.60	1.0044	0.14	Q	.	.	.	.	
23.76	1.0062	0.14	Q	.	.	.	.	
23.91	1.0080	0.14	Q	.	.	.	.	
24.07	1.0097	0.13	Q	.	.	.	.	
24.22	1.0106	0.00	Q	.	.	.	.	

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1443.1
10%	83.8
20%	27.9
30%	18.6
40%	9.3
50%	9.3
60%	9.3
70%	9.3
80%	9.3
90%	9.3

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******************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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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

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 Problem Descriptions:
  REDLANDS
  NODE 20975.5 TO NODE 20975
  APR 2014 DMALOTT
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =    3.73
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.101
    LOW LOSS FRACTION = 0.108
    TIME OF CONCENTRATION(MIN.) =  9.35
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.46
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.95
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.25
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.03
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  2.75
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.50

------------------------------------------------------------------------------

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     1.38
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     0.33

******************************************************************************
  TIME     VOLUME       Q    0.        5.0      10.0      15.0      20.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.10      0.0022      0.34  Q         .         .         .         .
  0.26      0.0066      0.34  Q         .         .         .         .
  0.42      0.0111      0.35  Q         .         .         .         .
  0.57      0.0156      0.35  Q         .         .         .         .
  0.73      0.0200      0.35  Q         .         .         .         .
  0.88      0.0246      0.35  Q         .         .         .         .
  1.04      0.0291      0.35  Q         .         .         .         .
  1.20      0.0337      0.36  Q         .         .         .         .
  1.35      0.0383      0.36  Q         .         .         .         .
  1.51      0.0429      0.36  Q         .         .         .         .
```



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  1.66      0.0475      0.36  Q         .         .         .         .
  1.82      0.0522      0.36  Q         .         .         .         .
  1.97      0.0568      0.36  Q         .         .         .         .
  2.13      0.0616      0.37  Q         .         .         .         .
  2.29      0.0663      0.37  Q         .         .         .         .
  2.44      0.0711      0.37  Q         .         .         .         .
  2.60      0.0758      0.37  Q         .         .         .         .
  2.75      0.0807      0.38  Q         .         .         .         .
  2.91      0.0855      0.38  Q         .         .         .         .
  3.07      0.0904      0.38  Q         .         .         .         .
  3.22      0.0953      0.38  Q         .         .         .         .
  3.38      0.1002      0.38  Q         .         .         .         .
  3.53      0.1052      0.39  Q         .         .         .         .
  3.69      0.1102      0.39  Q         .         .         .         .
  3.84      0.1152      0.39  Q         .         .         .         .
  4.00      0.1203      0.39  Q         .         .         .         .
  4.16      0.1254      0.40  Q         .         .         .         .
  4.31      0.1305      0.40  Q         .         .         .         .
  4.47      0.1356      0.40  Q         .         .         .         .
  4.62      0.1408      0.41  Q         .         .         .         .
  4.78      0.1461      0.41  Q         .         .         .         .
  4.94      0.1513      0.41  Q         .         .         .         .
  5.09      0.1566      0.41  Q         .         .         .         .
  5.25      0.1620      0.42  Q         .         .         .         .
  5.40      0.1674      0.42  Q         .         .         .         .
  5.56      0.1728      0.42  Q         .         .         .         .
  5.71      0.1782      0.42  Q         .         .         .         .
  5.87      0.1837      0.43  Q         .         .         .         .
  6.03      0.1893      0.43  Q         .         .         .         .
  6.18      0.1948      0.44  Q         .         .         .         .
  6.34      0.2005      0.44  Q         .         .         .         .
  6.49      0.2061      0.44  Q         .         .         .         .
  6.65      0.2119      0.45  Q         .         .         .         .
  6.81      0.2176      0.45  Q         .         .         .         .
  6.96      0.2234      0.45  Q         .         .         .         .
  7.12      0.2293      0.46  Q         .         .         .         .
  7.27      0.2352      0.46  Q         .         .         .         .
  7.43      0.2412      0.47  Q         .         .         .         .
  7.58      0.2472      0.47  Q         .         .         .         .
  7.74      0.2533      0.47  Q         .         .         .         .
  7.90      0.2594      0.48  Q         .         .         .         .
  8.05      0.2656      0.48  Q         .         .         .         .
  8.21      0.2718      0.49  Q         .         .         .         .
  8.36      0.2782      0.49  Q         .         .         .         .
  8.52      0.2845      0.50  Q         .         .         .         .
  8.68      0.2910      0.50  .Q        .         .         .         .
  8.83      0.2975      0.51  .Q        .         .         .         .
  8.99      0.3041      0.51  .Q        .         .         .         .
  9.14      0.3107      0.52  .Q        .         .         .         .
  9.30      0.3174      0.53  .Q        .         .         .         .
  9.45      0.3242      0.53  .Q        .         .         .         .
  9.61      0.3311      0.54  .Q        .         .         .         .
  9.77      0.3381      0.54  .Q        .         .         .         .
  9.92      0.3451      0.55  .Q        .         .         .         .
 10.08      0.3523      0.56  .Q        .         .         .         .
 10.23      0.3595      0.57  .Q        .         .         .         .
 10.39      0.3668      0.57  .Q        .         .         .         .
 10.55      0.3743      0.58  .Q        .         .         .         .
```

10.70	0.3818	0.59	.Q	.	.	.	.
10.86	0.3894	0.60	.Q	.	.	.	.
11.01	0.3972	0.61	.Q	.	.	.	.
11.17	0.4051	0.62	.Q	.	.	.	.
11.32	0.4131	0.62	.Q	.	.	.	.
11.48	0.4212	0.64	.Q	.	.	.	.
11.64	0.4295	0.65	.Q	.	.	.	.
11.79	0.4379	0.66	.Q	.	.	.	.
11.95	0.4465	0.67	.Q	.	.	.	.
12.10	0.4549	0.64	.Q	.	.	.	.
12.26	0.4630	0.61	.Q	.	.	.	.
12.42	0.4710	0.63	.Q	.	.	.	.
12.57	0.4791	0.64	.Q	.	.	.	.
12.73	0.4875	0.66	.Q	.	.	.	.
12.88	0.4961	0.67	.Q	.	.	.	.
13.04	0.5049	0.70	.Q	.	.	.	.
13.20	0.5140	0.71	.Q	.	.	.	.
13.35	0.5234	0.74	.Q	.	.	.	.
13.51	0.5330	0.76	.Q	.	.	.	.
13.66	0.5430	0.79	.Q	.	.	.	.
13.82	0.5533	0.81	.Q	.	.	.	.
13.97	0.5641	0.86	.Q	.	.	.	.
14.13	0.5753	0.88	.Q	.	.	.	.
14.29	0.5871	0.94	.Q	.	.	.	.
14.44	0.5994	0.97	.Q	.	.	.	.
14.60	0.6124	1.05	. Q	.	.	.	.
14.75	0.6262	1.09	. Q	.	.	.	.
14.91	0.6409	1.19	. Q	.	.	.	.
15.07	0.6567	1.26	. Q	.	.	.	.
15.22	0.6739	1.41	. Q	.	.	.	.
15.38	0.6927	1.52	. Q	.	.	.	.
15.53	0.7130	1.63	. Q	.	.	.	.
15.69	0.7353	1.84	. Q	.	.	.	.
15.84	0.7645	2.69	. Q	.	.	.	.
16.00	0.8062	3.80	. Q	.	.	.	.
16.16	0.9107	12.43	.	.	.	Q	.
16.31	1.0046	2.16	. Q	.	.	.	.
16.47	1.0286	1.57	. Q	.	.	.	.
16.62	1.0472	1.33	. Q	.	.	.	.
16.78	1.0631	1.14	. Q	.	.	.	.
16.93	1.0769	1.01	. Q	.	.	.	.
17.09	1.0893	0.91	.Q	.	.	.	.
17.25	1.1006	0.83	.Q	.	.	.	.
17.40	1.1110	0.77	.Q	.	.	.	.
17.56	1.1206	0.73	.Q	.	.	.	.
17.71	1.1297	0.69	.Q	.	.	.	.
17.87	1.1383	0.65	.Q	.	.	.	.
18.03	1.1465	0.62	.Q	.	.	.	.
18.18	1.1548	0.68	.Q	.	.	.	.
18.34	1.1634	0.65	.Q	.	.	.	.
18.49	1.1717	0.63	.Q	.	.	.	.
18.65	1.1797	0.61	.Q	.	.	.	.
18.81	1.1874	0.59	.Q	.	.	.	.
18.96	1.1950	0.58	.Q	.	.	.	.
19.12	1.2023	0.56	.Q	.	.	.	.
19.27	1.2094	0.55	.Q	.	.	.	.
19.43	1.2164	0.53	.Q	.	.	.	.
19.58	1.2232	0.52	.Q	.	.	.	.

19.74	1.2299	0.51	.Q	.	.	.	.
19.90	1.2364	0.50	.Q	.	.	.	.
20.05	1.2428	0.49	Q	.	.	.	.
20.21	1.2490	0.48	Q	.	.	.	.
20.36	1.2551	0.47	Q	.	.	.	.
20.52	1.2612	0.46	Q	.	.	.	.
20.67	1.2671	0.46	Q	.	.	.	.
20.83	1.2729	0.45	Q	.	.	.	.
20.99	1.2786	0.44	Q	.	.	.	.
21.14	1.2842	0.43	Q	.	.	.	.
21.30	1.2898	0.43	Q	.	.	.	.
21.45	1.2952	0.42	Q	.	.	.	.
21.61	1.3006	0.41	Q	.	.	.	.
21.77	1.3059	0.41	Q	.	.	.	.
21.92	1.3111	0.40	Q	.	.	.	.
22.08	1.3163	0.40	Q	.	.	.	.
22.23	1.3214	0.39	Q	.	.	.	.
22.39	1.3264	0.39	Q	.	.	.	.
22.55	1.3314	0.38	Q	.	.	.	.
22.70	1.3363	0.38	Q	.	.	.	.
22.86	1.3411	0.37	Q	.	.	.	.
23.01	1.3459	0.37	Q	.	.	.	.
23.17	1.3507	0.37	Q	.	.	.	.
23.32	1.3553	0.36	Q	.	.	.	.
23.48	1.3600	0.36	Q	.	.	.	.
23.64	1.3646	0.35	Q	.	.	.	.
23.79	1.3691	0.35	Q	.	.	.	.
23.95	1.3736	0.35	Q	.	.	.	.
24.10	1.3780	0.34	Q	.	.	.	.
24.26	1.3803	0.00	Q	.	.	.	.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1449.2
10%	102.9
20%	28.1
30%	18.7
40%	9.4
50%	9.4
60%	9.4
70%	9.4
80%	9.4
90%	9.4

```
******************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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                          Analysis prepared by:

                              RBF Consulting
                            14257 Alton Parkway
                                 Irvine, CA
                                   92618

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 Problem Descriptions:
  REDLANDS
  NODE 20976.5 TO NODE 20965
  APR 2014 DMALOTT
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =    5.41
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.298
    LOW LOSS FRACTION = 0.227
    TIME OF CONCENTRATION(MIN.) = 10.25
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.46
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.95
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.25
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.03
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  2.75
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.50

------------------------------------------------------------------------------

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     1.75
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     0.73

******************************************************************************
  TIME     VOLUME       Q    0.        5.0      10.0      15.0      20.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.11      0.0020      0.43  Q         .         .         .         .
  0.28      0.0081      0.43  Q         .         .         .         .
  0.45      0.0142      0.44  Q         .         .         .         .
  0.62      0.0204      0.44  Q         .         .         .         .
  0.80      0.0266      0.44  Q         .         .         .         .
  0.97      0.0328      0.44  Q         .         .         .         .
  1.14      0.0391      0.45  Q         .         .         .         .
  1.31      0.0454      0.45  Q         .         .         .         .
  1.48      0.0518      0.45  Q         .         .         .         .
  1.65      0.0581      0.45  Q         .         .         .         .
```



```
  1.82      0.0646      0.46  Q         .         .         .         .
  1.99      0.0710      0.46  Q         .         .         .         .
  2.16      0.0775      0.46  Q         .         .         .         .
  2.33      0.0840      0.46  Q         .         .         .         .
  2.50      0.0906      0.47  Q         .         .         .         .
  2.67      0.0972      0.47  Q         .         .         .         .
  2.85      0.1039      0.47  Q         .         .         .         .
  3.02      0.1106      0.48  Q         .         .         .         .
  3.19      0.1173      0.48  Q         .         .         .         .
  3.36      0.1241      0.48  Q         .         .         .         .
  3.53      0.1310      0.49  Q         .         .         .         .
  3.70      0.1378      0.49  Q         .         .         .         .
  3.87      0.1448      0.49  Q         .         .         .         .
  4.04      0.1517      0.50  Q         .         .         .         .
  4.21      0.1588      0.50  .Q        .         .         .         .
  4.38      0.1658      0.50  .Q        .         .         .         .
  4.55      0.1730      0.51  .Q        .         .         .         .
  4.72      0.1802      0.51  .Q        .         .         .         .
  4.90      0.1874      0.52  .Q        .         .         .         .
  5.07      0.1947      0.52  .Q        .         .         .         .
  5.24      0.2020      0.52  .Q        .         .         .         .
  5.41      0.2094      0.53  .Q        .         .         .         .
  5.58      0.2169      0.53  .Q        .         .         .         .
  5.75      0.2244      0.53  .Q        .         .         .         .
  5.92      0.2320      0.54  .Q        .         .         .         .
  6.09      0.2397      0.54  .Q        .         .         .         .
  6.26      0.2474      0.55  .Q        .         .         .         .
  6.43      0.2552      0.55  .Q        .         .         .         .
  6.60      0.2630      0.56  .Q        .         .         .         .
  6.78      0.2709      0.56  .Q        .         .         .         .
  6.95      0.2789      0.57  .Q        .         .         .         .
  7.12      0.2870      0.57  .Q        .         .         .         .
  7.29      0.2951      0.58  .Q        .         .         .         .
  7.46      0.3034      0.58  .Q        .         .         .         .
  7.63      0.3117      0.59  .Q        .         .         .         .
  7.80      0.3201      0.60  .Q        .         .         .         .
  7.97      0.3285      0.60  .Q        .         .         .         .
  8.14      0.3371      0.61  .Q        .         .         .         .
  8.31      0.3458      0.62  .Q        .         .         .         .
  8.48      0.3545      0.62  .Q        .         .         .         .
  8.65      0.3634      0.63  .Q        .         .         .         .
  8.82      0.3723      0.64  .Q        .         .         .         .
  9.00      0.3814      0.65  .Q        .         .         .         .
  9.17      0.3905      0.65  .Q        .         .         .         .
  9.34      0.3998      0.66  .Q        .         .         .         .
  9.51      0.4092      0.67  .Q        .         .         .         .
  9.68      0.4187      0.68  .Q        .         .         .         .
  9.85      0.4284      0.69  .Q        .         .         .         .
 10.02      0.4381      0.70  .Q        .         .         .         .
 10.19      0.4481      0.71  .Q        .         .         .         .
 10.36      0.4581      0.72  .Q        .         .         .         .
 10.53      0.4683      0.73  .Q        .         .         .         .
 10.70      0.4787      0.74  .Q        .         .         .         .
 10.88      0.4892      0.75  .Q        .         .         .         .
 11.05      0.4999      0.77  .Q        .         .         .         .
 11.22      0.5108      0.78  .Q        .         .         .         .
 11.39      0.5219      0.79  .Q        .         .         .         .
 11.56      0.5331      0.80  .Q        .         .         .         .
```

11.73	0.5446	0.82	.Q	.	.	.	.
11.90	0.5563	0.83	.Q	.	.	.	.
12.07	0.5682	0.84	.Q	.	.	.	.
12.24	0.5795	0.76	.Q	.	.	.	.
12.41	0.5905	0.79	.Q	.	.	.	.
12.58	0.6017	0.80	.Q	.	.	.	.
12.75	0.6133	0.83	.Q	.	.	.	.
12.93	0.6252	0.85	.Q	.	.	.	.
13.10	0.6374	0.89	.Q	.	.	.	.
13.27	0.6501	0.90	.Q	.	.	.	.
13.44	0.6631	0.95	.Q	.	.	.	.
13.61	0.6767	0.97	.Q	.	.	.	.
13.78	0.6907	1.02	. Q	.	.	.	.
13.95	0.7054	1.05	. Q	.	.	.	.
14.12	0.7207	1.12	. Q	.	.	.	.
14.29	0.7369	1.16	. Q	.	.	.	.
14.46	0.7539	1.25	. Q	.	.	.	.
14.63	0.7719	1.30	. Q	.	.	.	.
14.80	0.7912	1.42	. Q	.	.	.	.
14.98	0.8118	1.50	. Q	.	.	.	.
15.15	0.8343	1.69	. Q	.	.	.	.
15.32	0.8590	1.81	. Q	.	.	.	.
15.49	0.8857	1.97	. Q	.	.	.	.
15.66	0.9150	2.19	. Q	.	.	.	.
15.83	0.9530	3.20	. Q	.	.	.	.
16.00	1.0065	4.39	. Q	.	.	.	.
16.17	1.1510	16.08	.	.	.	. Q	.
16.34	1.2825	2.55	. Q	.	.	.	.
16.51	1.3144	1.96	. Q	.	.	.	.
16.68	1.3394	1.58	. Q	.	.	.	.
16.85	1.3602	1.36	. Q	.	.	.	.
17.02	1.3783	1.21	. Q	.	.	.	.
17.20	1.3944	1.08	. Q	.	.	.	.
17.37	1.4091	1.00	.Q	.	.	.	.
17.54	1.4227	0.93	.Q	.	.	.	.
17.71	1.4353	0.87	.Q	.	.	.	.
17.88	1.4472	0.82	.Q	.	.	.	.
18.05	1.4585	0.78	.Q	.	.	.	.
18.22	1.4699	0.85	.Q	.	.	.	.
18.39	1.4816	0.81	.Q	.	.	.	.
18.56	1.4929	0.78	.Q	.	.	.	.
18.73	1.5038	0.76	.Q	.	.	.	.
18.90	1.5143	0.73	.Q	.	.	.	.
19.08	1.5245	0.71	.Q	.	.	.	.
19.25	1.5345	0.69	.Q	.	.	.	.
19.42	1.5441	0.67	.Q	.	.	.	.
19.59	1.5535	0.66	.Q	.	.	.	.
19.76	1.5627	0.64	.Q	.	.	.	.
19.93	1.5716	0.63	.Q	.	.	.	.
20.10	1.5804	0.61	.Q	.	.	.	.
20.27	1.5889	0.60	.Q	.	.	.	.
20.44	1.5973	0.59	.Q	.	.	.	.
20.61	1.6056	0.58	.Q	.	.	.	.
20.78	1.6136	0.57	.Q	.	.	.	.
20.95	1.6215	0.56	.Q	.	.	.	.
21.12	1.6293	0.55	.Q	.	.	.	.
21.30	1.6370	0.54	.Q	.	.	.	.
21.47	1.6445	0.53	.Q	.	.	.	.

21.64	1.6519	0.52	.Q	.	.	.	.
21.81	1.6592	0.51	.Q	.	.	.	.
21.98	1.6664	0.50	.Q	.	.	.	.
22.15	1.6735	0.50	Q	.	.	.	.
22.32	1.6804	0.49	Q	.	.	.	.
22.49	1.6873	0.48	Q	.	.	.	.
22.66	1.6941	0.48	Q	.	.	.	.
22.83	1.7008	0.47	Q	.	.	.	.
23.00	1.7074	0.47	Q	.	.	.	.
23.17	1.7140	0.46	Q	.	.	.	.
23.35	1.7204	0.45	Q	.	.	.	.
23.52	1.7268	0.45	Q	.	.	.	.
23.69	1.7331	0.44	Q	.	.	.	.
23.86	1.7393	0.44	Q	.	.	.	.
24.03	1.7455	0.43	Q	.	.	.	.
24.20	1.7486	0.00	Q	.	.	.	.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1445.2
10%	92.2
20%	20.5
30%	10.2
40%	10.2
50%	10.2
60%	10.2
70%	10.2
80%	10.2
90%	10.2

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______________________________________________________________________________
******************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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             Ver. 18.0  Release Date: 05/01/2011  License ID 1264

                          Analysis prepared by:




******************************************************************************
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 Problem Descriptions:
  REDLANDS
  NODE 20977 TO NODE 20965
  APR 2014 DMALOTT
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =    4.50
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.075
    LOW LOSS FRACTION = 0.093
    TIME OF CONCENTRATION(MIN.) =  7.34
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.46
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.95
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.25
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.03
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  2.75
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.50

------------------------------------------------------------------------------

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     1.69
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     0.37

******************************************************************************
  TIME     VOLUME       Q    0.        5.0      10.0      15.0      20.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.10      0.0021      0.42  Q         .         .         .         .
  0.22      0.0064      0.42  Q         .         .         .         .
  0.34      0.0107      0.42  Q         .         .         .         .
  0.46      0.0150      0.43  Q         .         .         .         .
  0.59      0.0193      0.43  Q         .         .         .         .
  0.71      0.0236      0.43  Q         .         .         .         .
  0.83      0.0280      0.43  Q         .         .         .         .
  0.95      0.0323      0.43  Q         .         .         .         .
  1.08      0.0367      0.43  Q         .         .         .         .
  1.20      0.0411      0.44  Q         .         .         .         .
```



```
  1.32      0.0455      0.44  Q         .         .         .         .
  1.44      0.0500      0.44  Q         .         .         .         .
  1.56      0.0544      0.44  Q         .         .         .         .
  1.69      0.0589      0.44  Q         .         .         .         .
  1.81      0.0634      0.44  Q         .         .         .         .
  1.93      0.0679      0.45  Q         .         .         .         .
  2.05      0.0724      0.45  Q         .         .         .         .
  2.18      0.0770      0.45  Q         .         .         .         .
  2.30      0.0815      0.45  Q         .         .         .         .
  2.42      0.0861      0.46  Q         .         .         .         .
  2.54      0.0908      0.46  Q         .         .         .         .
  2.67      0.0954      0.46  Q         .         .         .         .
  2.79      0.1000      0.46  Q         .         .         .         .
  2.91      0.1047      0.46  Q         .         .         .         .
  3.03      0.1094      0.47  Q         .         .         .         .
  3.15      0.1141      0.47  Q         .         .         .         .
  3.28      0.1189      0.47  Q         .         .         .         .
  3.40      0.1236      0.47  Q         .         .         .         .
  3.52      0.1284      0.47  Q         .         .         .         .
  3.64      0.1332      0.48  Q         .         .         .         .
  3.77      0.1381      0.48  Q         .         .         .         .
  3.89      0.1429      0.48  Q         .         .         .         .
  4.01      0.1478      0.48  Q         .         .         .         .
  4.13      0.1527      0.49  Q         .         .         .         .
  4.26      0.1577      0.49  Q         .         .         .         .
  4.38      0.1626      0.49  Q         .         .         .         .
  4.50      0.1676      0.49  Q         .         .         .         .
  4.62      0.1726      0.50  Q         .         .         .         .
  4.75      0.1776      0.50  Q         .         .         .         .
  4.87      0.1827      0.50  .Q        .         .         .         .
  4.99      0.1878      0.50  .Q        .         .         .         .
  5.11      0.1929      0.51  .Q        .         .         .         .
  5.23      0.1981      0.51  .Q        .         .         .         .
  5.36      0.2033      0.51  .Q        .         .         .         .
  5.48      0.2085      0.52  .Q        .         .         .         .
  5.60      0.2137      0.52  .Q        .         .         .         .
  5.72      0.2190      0.52  .Q        .         .         .         .
  5.85      0.2243      0.53  .Q        .         .         .         .
  5.97      0.2296      0.53  .Q        .         .         .         .
  6.09      0.2350      0.53  .Q        .         .         .         .
  6.21      0.2404      0.53  .Q        .         .         .         .
  6.34      0.2458      0.54  .Q        .         .         .         .
  6.46      0.2512      0.54  .Q        .         .         .         .
  6.58      0.2567      0.55  .Q        .         .         .         .
  6.70      0.2623      0.55  .Q        .         .         .         .
  6.82      0.2679      0.55  .Q        .         .         .         .
  6.95      0.2735      0.56  .Q        .         .         .         .
  7.07      0.2791      0.56  .Q        .         .         .         .
  7.19      0.2848      0.56  .Q        .         .         .         .
  7.31      0.2905      0.57  .Q        .         .         .         .
  7.44      0.2963      0.57  .Q        .         .         .         .
  7.56      0.3021      0.58  .Q        .         .         .         .
  7.68      0.3079      0.58  .Q        .         .         .         .
  7.80      0.3138      0.59  .Q        .         .         .         .
  7.93      0.3197      0.59  .Q        .         .         .         .
  8.05      0.3257      0.59  .Q        .         .         .         .
  8.17      0.3317      0.60  .Q        .         .         .         .
  8.29      0.3378      0.60  .Q        .         .         .         .
```

8.42	0.3439	0.61	.Q
8.54	0.3501	0.61	.Q
8.66	0.3563	0.62	.Q
8.78	0.3626	0.62	.Q
8.90	0.3689	0.63	.Q
9.03	0.3753	0.63	.Q
9.15	0.3817	0.64	.Q
9.27	0.3882	0.65	.Q
9.39	0.3947	0.65	.Q
9.52	0.4013	0.66	.Q
9.64	0.4080	0.66	.Q
9.76	0.4147	0.67	.Q
9.88	0.4215	0.67	.Q
10.01	0.4284	0.68	.Q
10.13	0.4353	0.69	.Q
10.25	0.4423	0.70	.Q
10.37	0.4494	0.70	.Q
10.49	0.4565	0.71	.Q
10.62	0.4637	0.72	.Q
10.74	0.4710	0.73	.Q
10.86	0.4784	0.73	.Q
10.98	0.4859	0.75	.Q
11.11	0.4935	0.75	.Q
11.23	0.5012	0.76	.Q
11.35	0.5089	0.77	.Q
11.47	0.5168	0.78	.Q
11.60	0.5247	0.79	.Q
11.72	0.5328	0.81	.Q
11.84	0.5410	0.81	.Q
11.96	0.5493	0.83	.Q
12.09	0.5577	0.83	.Q
12.21	0.5657	0.75	.Q
12.33	0.5734	0.76	.Q
12.45	0.5811	0.78	.Q
12.57	0.5891	0.79	.Q
12.70	0.5971	0.81	.Q
12.82	0.6054	0.82	.Q
12.94	0.6138	0.84	.Q
13.06	0.6224	0.86	.Q
13.19	0.6312	0.88	.Q
13.31	0.6402	0.90	.Q
13.43	0.6495	0.93	.Q
13.55	0.6590	0.95	.Q
13.68	0.6687	0.98	.Q
13.80	0.6787	1.00	. Q
13.92	0.6890	1.04	. Q
14.04	0.6997	1.07	. Q
14.16	0.7108	1.12	. Q
14.29	0.7223	1.15	. Q
14.41	0.7342	1.21	. Q
14.53	0.7466	1.25	. Q
14.65	0.7596	1.32	. Q
14.78	0.7733	1.37	. Q
14.90	0.7876	1.47	. Q
15.02	0.8028	1.53	. Q
15.14	0.8190	1.68	. Q
15.27	0.8364	1.76	. Q
15.39	0.8551	1.95	. Q

15.51	0.8747	1.92	. Q
15.63	0.8961	2.31	. Q
15.76	0.9210	2.62	. Q
15.88	0.9539	3.90	. Q
16.00	1.0012	5.46	. Q
16.12	1.1172	17.49	.
16.24	1.2213	3.12	. Q
16.37	1.2477	2.09	. Q
16.49	1.2677	1.86	. Q
16.61	1.2852	1.60	. Q
16.73	1.3004	1.42	. Q
16.86	1.3141	1.28	. Q
16.98	1.3266	1.18	. Q
17.10	1.3381	1.09	. Q
17.22	1.3488	1.02	. Q
17.35	1.3588	0.96	.Q
17.47	1.3683	0.91	.Q
17.59	1.3773	0.87	.Q
17.71	1.3859	0.83	.Q
17.83	1.3941	0.80	.Q
17.96	1.4021	0.77	.Q
18.08	1.4097	0.74	.Q
18.20	1.4176	0.82	.Q
18.32	1.4258	0.80	.Q
18.45	1.4338	0.78	.Q
18.57	1.4415	0.76	.Q
18.69	1.4491	0.74	.Q
18.81	1.4565	0.72	.Q
18.94	1.4637	0.71	.Q
19.06	1.4708	0.69	.Q
19.18	1.4777	0.68	.Q
19.30	1.4845	0.67	.Q
19.43	1.4912	0.65	.Q
19.55	1.4977	0.64	.Q
19.67	1.5042	0.63	.Q
19.79	1.5105	0.62	.Q
19.91	1.5167	0.61	.Q
20.04	1.5228	0.60	.Q
20.16	1.5288	0.59	.Q
20.28	1.5348	0.58	.Q
20.40	1.5406	0.57	.Q
20.53	1.5464	0.57	.Q
20.65	1.5521	0.56	.Q
20.77	1.5577	0.55	.Q
20.89	1.5632	0.54	.Q
21.02	1.5687	0.54	.Q
21.14	1.5741	0.53	.Q
21.26	1.5794	0.52	.Q
21.38	1.5847	0.52	.Q
21.51	1.5899	0.51	.Q
21.63	1.5950	0.51	.Q
21.75	1.6001	0.50	.Q
21.87	1.6052	0.50	Q
21.99	1.6101	0.49	Q
22.12	1.6151	0.49	Q
22.24	1.6200	0.48	Q
22.36	1.6248	0.48	Q
22.48	1.6296	0.47	Q

22.61	1.6343	0.47	Q	.	.	.	.
22.73	1.6390	0.46	Q	.	.	.	.
22.85	1.6437	0.46	Q	.	.	.	.
22.97	1.6483	0.45	Q	.	.	.	.
23.10	1.6529	0.45	Q	.	.	.	.
23.22	1.6574	0.45	Q	.	.	.	.
23.34	1.6619	0.44	Q	.	.	.	.
23.46	1.6663	0.44	Q	.	.	.	.
23.58	1.6707	0.44	Q	.	.	.	.
23.71	1.6751	0.43	Q	.	.	.	.
23.83	1.6795	0.43	Q	.	.	.	.
23.95	1.6838	0.42	Q	.	.	.	.
24.07	1.6881	0.42	Q	.	.	.	.
24.20	1.6902	0.00	Q	.	.	.	.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1446.0
10%	80.7
20%	22.0
30%	14.7
40%	7.3
50%	7.3
60%	7.3
70%	7.3
80%	7.3
90%	7.3

```
______________________________________________________________________________
******************************************************************************
                     SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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             Ver. 18.0  Release Date: 05/01/2011  License ID 1264

                          Analysis prepared by:




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 Problem Descriptions:
  REDLNADS
  NODE 21000 TO NODE 21044
  APR 2014 DMALOTT
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    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =  220.79
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.350
    LOW LOSS FRACTION = 0.258
    TIME OF CONCENTRATION(MIN.) = 24.87
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.46
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.95
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.25
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.03
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  2.75
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.50

------------------------------------------------------------------------------

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =    68.43
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =    32.77

******************************************************************************
  TIME     VOLUME       Q    0.       90.0     180.0     270.0     360.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.25      0.0000      0.00  Q         .         .         .         .
  0.66      0.2929     17.10  .Q        .         .         .         .
  1.08      0.8814     17.26  .Q        .         .         .         .
  1.49      1.4780     17.58  .Q        .         .         .         .
  1.91      2.0830     17.74  .Q        .         .         .         .
  2.32      2.6967     18.09  . Q       .         .         .         .
  2.74      3.3196     18.27  . Q       .         .         .         .
  3.15      3.9520     18.65  . Q       .         .         .         .
  3.56      4.5944     18.85  . Q       .         .         .         .
  3.98      5.2474     19.27  . Q       .         .         .         .
```



```
  4.39      5.9114     19.49  . Q       .         .         .         .
  4.81      6.5870     19.96  . Q       .         .         .         .
  5.22      7.2748     20.20  . Q       .         .         .         .
  5.64      7.9757     20.72  . Q       .         .         .         .
  6.05      8.6902     20.99  . Q       .         .         .         .
  6.47      9.4193     21.58  . Q       .         .         .         .
  6.88     10.1638     21.89  . Q       .         .         .         .
  7.30     10.9249     22.55  . Q       .         .         .         .
  7.71     11.7035     22.91  . Q       .         .         .         .
  8.12     12.5013     23.67  . Q       .         .         .         .
  8.54     13.3192     24.08  . Q       .         .         .         .
  8.95     14.1594     24.97  . Q       .         .         .         .
  9.37     15.0232     25.46  . Q       .         .         .         .
  9.78     15.9135     26.52  . Q       .         .         .         .
 10.20     16.8320     27.10  .  Q      .         .         .         .
 10.61     17.7826     28.40  .  Q      .         .         .         .
 11.03     18.7676     29.11  .  Q      .         .         .         .
 11.44     19.7927     30.73  .  Q      .         .         .         .
 11.85     20.8613     31.65  .  Q      .         .         .         .
 12.27     21.9476     31.77  .  Q      .         .         .         .
 12.68     23.0190     30.79  .  Q      .         .         .         .
 13.10     24.1234     33.69  .  Q      .         .         .         .
 13.51     25.3078     35.46  .  Q      .         .         .         .
 13.93     26.5993     39.94  .   Q     .         .         .         .
 14.34     28.0188     42.94  .   Q     .         .         .         .
 14.76     29.6346     51.40  .    Q    .         .         .         .
 15.17     31.5003     57.53  .     Q   .         .         .         .
 15.59     33.7995     76.71  .       Q .         .         .         .
 16.00     36.8194     99.60  .         .Q        .         .         .
 16.41     44.5645    352.59  .         .         .         .         Q.
 16.83     51.7389     66.28  .       Q .         .         .         .
 17.24     53.6757     46.80  .    Q    .         .         .         .
 17.66     55.1199     37.52  .   Q     .         .         .         .
 18.07     56.3130     32.15  .  Q      .         .         .         .
 18.49     57.4230     32.66  .  Q      .         .         .         .
 18.90     58.4944     29.89  .  Q      .         .         .         .
 19.32     59.4813     27.73  .  Q      .         .         .         .
 19.73     60.4010     25.97  . Q       .         .         .         .
 20.14     61.2658     24.52  . Q       .         .         .         .
 20.56     62.0844     23.28  . Q       .         .         .         .
 20.97     62.8636     22.21  . Q       .         .         .         .
 21.39     63.6085     21.28  . Q       .         .         .         .
 21.80     64.3233     20.45  . Q       .         .         .         .
 22.22     65.0115     19.72  . Q       .         .         .         .
 22.63     65.6757     19.06  . Q       .         .         .         .
 23.05     66.3183     18.46  . Q       .         .         .         .
 23.46     66.9413     17.91  .Q        .         .         .         .
 23.88     67.5464     17.41  .Q        .         .         .         .
 24.29     68.1352     16.96  .Q        .         .         .         .
 24.70     68.4257      0.00  Q         .         .         .         .
------------------------------------------------------------------------------
------------------------------------------------------------------------------
    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
    (Note: 100% of Peak Flow Rate estimate assumed to have
    an instantaneous time duration)

    Percentile of Estimated               Duration
        Peak Flow Rate                    (minutes)
```

0%	1442.5
10%	273.6
20%	74.6
30%	24.9
40%	24.9
50%	24.9
60%	24.9
70%	24.9
80%	24.9
90%	24.9

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******************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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                          Analysis prepared by:

                              RBF Consulting
                            14257 Alton Parkway
                                 Irvine, CA
                                   92618

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 Problem Descriptions:
  REDLANDS
  NODET 21097 TO NODE 21045
  APR 2014 DMALOTT
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   25.64
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.169
    LOW LOSS FRACTION = 0.149
    TIME OF CONCENTRATION(MIN.) = 12.26
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.46
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.95
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.25
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  1.94
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  2.56
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  4.77

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    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     7.88
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     2.31

******************************************************************************
  TIME     VOLUME       Q    0.       20.0      40.0      60.0      80.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.06      0.0000      0.00  Q         .         .         .         .
  0.27      0.0149      1.76  Q         .         .         .         .
  0.47      0.0447      1.77  Q         .         .         .         .
  0.67      0.0747      1.79  Q         .         .         .         .
  0.88      0.1049      1.79  Q         .         .         .         .
  1.08      0.1353      1.81  Q         .         .         .         .
  1.29      0.1660      1.82  Q         .         .         .         .
  1.49      0.1969      1.84  Q         .         .         .         .
  1.70      0.2281      1.85  Q         .         .         .         .
  1.90      0.2595      1.87  Q         .         .         .         .
```



```
  2.11      0.2911      1.88  Q         .         .         .         .
  2.31      0.3230      1.90  Q         .         .         .         .
  2.51      0.3552      1.91  Q         .         .         .         .
  2.72      0.3876      1.93  Q         .         .         .         .
  2.92      0.4203      1.94  Q         .         .         .         .
  3.13      0.4533      1.96  Q         .         .         .         .
  3.33      0.4865      1.98  Q         .         .         .         .
  3.54      0.5201      2.00  Q         .         .         .         .
  3.74      0.5539      2.01  .Q        .         .         .         .
  3.94      0.5881      2.04  .Q        .         .         .         .
  4.15      0.6226      2.05  .Q        .         .         .         .
  4.35      0.6574      2.07  .Q        .         .         .         .
  4.56      0.6925      2.09  .Q        .         .         .         .
  4.76      0.7280      2.11  .Q        .         .         .         .
  4.97      0.7638      2.13  .Q        .         .         .         .
  5.17      0.8000      2.16  .Q        .         .         .         .
  5.37      0.8366      2.17  .Q        .         .         .         .
  5.58      0.8735      2.20  .Q        .         .         .         .
  5.78      0.9108      2.22  .Q        .         .         .         .
  5.99      0.9486      2.25  .Q        .         .         .         .
  6.19      0.9868      2.27  .Q        .         .         .         .
  6.40      1.0254      2.30  .Q        .         .         .         .
  6.60      1.0644      2.32  .Q        .         .         .         .
  6.80      1.1039      2.36  .Q        .         .         .         .
  7.01      1.1439      2.38  .Q        .         .         .         .
  7.21      1.1844      2.42  .Q        .         .         .         .
  7.42      1.2254      2.44  .Q        .         .         .         .
  7.62      1.2669      2.48  .Q        .         .         .         .
  7.83      1.3090      2.50  .Q        .         .         .         .
  8.03      1.3517      2.55  .Q        .         .         .         .
  8.24      1.3949      2.57  .Q        .         .         .         .
  8.44      1.4388      2.62  .Q        .         .         .         .
  8.64      1.4833      2.65  .Q        .         .         .         .
  8.85      1.5285      2.70  .Q        .         .         .         .
  9.05      1.5743      2.73  .Q        .         .         .         .
  9.26      1.6210      2.79  .Q        .         .         .         .
  9.46      1.6683      2.82  .Q        .         .         .         .
  9.67      1.7165      2.89  .Q        .         .         .         .
  9.87      1.7655      2.92  .Q        .         .         .         .
 10.07      1.8154      2.99  .Q        .         .         .         .
 10.28      1.8663      3.03  .Q        .         .         .         .
 10.48      1.9181      3.11  .Q        .         .         .         .
 10.69      1.9709      3.15  .Q        .         .         .         .
 10.89      2.0249      3.24  .Q        .         .         .         .
 11.10      2.0800      3.29  .Q        .         .         .         .
 11.30      2.1364      3.39  .Q        .         .         .         .
 11.50      2.1940      3.44  .Q        .         .         .         .
 11.71      2.2531      3.56  .Q        .         .         .         .
 11.91      2.3137      3.62  .Q        .         .         .         .
 12.12      2.3747      3.60  .Q        .         .         .         .
 12.32      2.4339      3.41  .Q        .         .         .         .
 12.53      2.4929      3.57  .Q        .         .         .         .
 12.73      2.5538      3.65  .Q        .         .         .         .
 12.93      2.6169      3.83  .Q        .         .         .         .
 13.14      2.6825      3.93  .Q        .         .         .         .
 13.34      2.7508      4.16  . Q       .         .         .         .
 13.55      2.8221      4.29  . Q       .         .         .         .
 13.75      2.8969      4.57  . Q       .         .         .         .
```

13.96	2.9755	4.74	. Q	.	.	.	.	
14.16	3.0588	5.12	. Q	.	.	.	.	
14.37	3.1471	5.34	. Q	.	.	.	.	
14.57	3.2419	5.88	. Q	.	.	.	.	
14.77	3.3441	6.21	. Q	.	.	.	.	
14.98	3.4562	7.06	. Q	.	.	.	.	
15.18	3.5800	7.61	. Q	.	.	.	.	
15.39	3.7216	9.17	. Q	.	.	.	.	
15.59	3.8856	10.26	. Q	.	.	.	.	
15.80	4.0974	14.83	. Q	.	.	.	.	
16.00	4.3964	20.58	. Q	.	.	.	.	
16.20	5.1679	70.79	.	.	.	.	Q	.
16.41	5.8665	11.94	. Q	.	.	.	.	
16.61	6.0373	8.29	. Q	.	.	.	.	
16.82	6.1630	6.60	. Q	.	.	.	.	
17.02	6.2660	5.60	. Q	.	.	.	.	
17.23	6.3548	4.92	. Q	.	.	.	.	
17.43	6.4337	4.42	. Q	.	.	.	.	
17.63	6.5051	4.04	. Q	.	.	.	.	
17.84	6.5708	3.74	.Q	.	.	.	.	
18.04	6.6318	3.49	.Q	.	.	.	.	
18.25	6.6924	3.68	.Q	.	.	.	.	
18.45	6.7530	3.50	.Q	.	.	.	.	
18.66	6.8107	3.34	.Q	.	.	.	.	
18.86	6.8659	3.19	.Q	.	.	.	.	
19.07	6.9187	3.07	.Q	.	.	.	.	
19.27	6.9696	2.95	.Q	.	.	.	.	
19.47	7.0186	2.85	.Q	.	.	.	.	
19.68	7.0660	2.76	.Q	.	.	.	.	
19.88	7.1119	2.68	.Q	.	.	.	.	
20.09	7.1564	2.60	.Q	.	.	.	.	
20.29	7.1997	2.53	.Q	.	.	.	.	
20.50	7.2418	2.46	.Q	.	.	.	.	
20.70	7.2828	2.40	.Q	.	.	.	.	
20.90	7.3228	2.34	.Q	.	.	.	.	
21.11	7.3618	2.29	.Q	.	.	.	.	
21.31	7.4000	2.24	.Q	.	.	.	.	
21.52	7.4374	2.19	.Q	.	.	.	.	
21.72	7.4739	2.14	.Q	.	.	.	.	
21.93	7.5098	2.10	.Q	.	.	.	.	
22.13	7.5449	2.06	.Q	.	.	.	.	
22.33	7.5794	2.02	.Q	.	.	.	.	
22.54	7.6132	1.99	Q	.	.	.	.	
22.74	7.6465	1.95	Q	.	.	.	.	
22.95	7.6792	1.92	Q	.	.	.	.	
23.15	7.7113	1.89	Q	.	.	.	.	
23.36	7.7430	1.86	Q	.	.	.	.	
23.56	7.7741	1.83	Q	.	.	.	.	
23.76	7.8048	1.80	Q	.	.	.	.	
23.97	7.8350	1.78	Q	.	.	.	.	
24.17	7.8649	1.75	Q	.	.	.	.	
24.38	7.8797	0.00	Q	.	.	.	.	

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1446.7
10%	98.1
20%	36.8
30%	12.3
40%	12.3
50%	12.3
60%	12.3
70%	12.3
80%	12.3
90%	12.3

```
******************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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             Ver. 18.0  Release Date: 05/01/2011  License ID 1264

                          Analysis prepared by:




******************************************************************************
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 Problem Descriptions:
  REDLANDS
  NODE 21080 TO NODE 21084
  APR 2014 DMALOTT
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   20.39
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.237
    LOW LOSS FRACTION = 0.190
    TIME OF CONCENTRATION(MIN.) = 15.12
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.46
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.95
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.25
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.03
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  2.75
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.50

------------------------------------------------------------------------------

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     6.89
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     2.45

******************************************************************************
  TIME     VOLUME       Q    0.       12.5      25.0      37.5      50.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.12      0.0087      1.70  .Q        .         .         .         .
  0.38      0.0443      1.71  .Q        .         .         .         .
  0.63      0.0801      1.73  .Q        .         .         .         .
  0.88      0.1162      1.74  .Q        .         .         .         .
  1.13      0.1526      1.76  .Q        .         .         .         .
  1.38      0.1893      1.77  .Q        .         .         .         .
  1.64      0.2263      1.79  .Q        .         .         .         .
  1.89      0.2636      1.80  .Q        .         .         .         .
  2.14      0.3013      1.82  .Q        .         .         .         .
  2.39      0.3393      1.83  .Q        .         .         .         .
```



```
  2.64      0.3776      1.85  .Q        .         .         .         .
  2.90      0.4163      1.86  .Q        .         .         .         .
  3.15      0.4554      1.89  .Q        .         .         .         .
  3.40      0.4948      1.90  .Q        .         .         .         .
  3.65      0.5347      1.93  .Q        .         .         .         .
  3.90      0.5749      1.94  .Q        .         .         .         .
  4.16      0.6156      1.97  .Q        .         .         .         .
  4.41      0.6567      1.98  .Q        .         .         .         .
  4.66      0.6982      2.01  .Q        .         .         .         .
  4.91      0.7402      2.02  .Q        .         .         .         .
  5.16      0.7826      2.05  .Q        .         .         .         .
  5.42      0.8256      2.07  .Q        .         .         .         .
  5.67      0.8690      2.10  .Q        .         .         .         .
  5.92      0.9130      2.12  .Q        .         .         .         .
  6.17      0.9575      2.15  .Q        .         .         .         .
  6.42      1.0025      2.17  .Q        .         .         .         .
  6.68      1.0482      2.21  .Q        .         .         .         .
  6.93      1.0945      2.23  .Q        .         .         .         .
  7.18      1.1414      2.27  .Q        .         .         .         .
  7.43      1.1889      2.29  .Q        .         .         .         .
  7.68      1.2372      2.34  .Q        .         .         .         .
  7.94      1.2861      2.36  .Q        .         .         .         .
  8.19      1.3358      2.41  .Q        .         .         .         .
  8.44      1.3863      2.44  .Q        .         .         .         .
  8.69      1.4377      2.49  .Q        .         .         .         .
  8.94      1.4898      2.52  . Q       .         .         .         .
  9.20      1.5430      2.58  . Q       .         .         .         .
  9.45      1.5970      2.61  . Q       .         .         .         .
  9.70      1.6521      2.68  . Q       .         .         .         .
  9.95      1.7083      2.71  . Q       .         .         .         .
 10.20      1.7656      2.79  . Q       .         .         .         .
 10.46      1.8241      2.83  . Q       .         .         .         .
 10.71      1.8839      2.92  . Q       .         .         .         .
 10.96      1.9451      2.96  . Q       .         .         .         .
 11.21      2.0079      3.06  . Q       .         .         .         .
 11.46      2.0721      3.11  . Q       .         .         .         .
 11.72      2.1382      3.23  . Q       .         .         .         .
 11.97      2.2061      3.29  . Q       .         .         .         .
 12.22      2.2725      3.09  . Q       .         .         .         .
 12.47      2.3367      3.08  . Q       .         .         .         .
 12.72      2.4026      3.25  . Q       .         .         .         .
 12.98      2.4712      3.34  . Q       .         .         .         .
 13.23      2.5429      3.55  . Q       .         .         .         .
 13.48      2.6180      3.67  . Q       .         .         .         .
 13.73      2.6973      3.94  .  Q      .         .         .         .
 13.98      2.7811      4.11  .  Q      .         .         .         .
 14.24      2.8709      4.52  .  Q      .         .         .         .
 14.49      2.9676      4.76  .  Q      .         .         .         .
 14.74      3.0731      5.36  .   Q     .         .         .         .
 14.99      3.1888      5.75  .   Q     .         .         .         .
 15.24      3.3199      6.84  .    Q    .         .         .         .
 15.50      3.4709      7.66  .     Q   .         .         .         .
 15.75      3.6526      9.79  .      Q  .         .         .         .
 16.00      3.8977     13.75  .         Q         .         .         .
 16.25      4.5415     48.08  .         .         .         .       Q .
 16.50      5.1253      7.99  .     Q   .         .         .         .
 16.76      5.2734      6.23  .   Q     .         .         .         .
 17.01      5.3907      5.04  .   Q     .         .         .         .
```

```
 17.26      5.4878      4.29  .  Q      .         .         .         .
 17.51      5.5720      3.80  .  Q      .         .         .         .
 17.76      5.6474      3.44  . Q       .         .         .         .
 18.02      5.7161      3.16  . Q       .         .         .         .
 18.27      5.7840      3.36  . Q       .         .         .         .
 18.52      5.8519      3.17  . Q       .         .         .         .
 18.77      5.9163      3.01  . Q       .         .         .         .
 19.02      5.9775      2.87  . Q       .         .         .         .
 19.28      6.0361      2.75  . Q       .         .         .         .
 19.53      6.0923      2.64  . Q       .         .         .         .
 19.78      6.1464      2.55  . Q       .         .         .         .
 20.03      6.1986      2.46  .Q        .         .         .         .
 20.28      6.2491      2.39  .Q        .         .         .         .
 20.54      6.2981      2.32  .Q        .         .         .         .
 20.79      6.3456      2.25  .Q        .         .         .         .
 21.04      6.3919      2.19  .Q        .         .         .         .
 21.29      6.4370      2.14  .Q        .         .         .         .
 21.54      6.4809      2.09  .Q        .         .         .         .
 21.80      6.5239      2.04  .Q        .         .         .         .
 22.05      6.5659      1.99  .Q        .         .         .         .
 22.30      6.6070      1.95  .Q        .         .         .         .
 22.55      6.6472      1.91  .Q        .         .         .         .
 22.80      6.6867      1.88  .Q        .         .         .         .
 23.06      6.7254      1.84  .Q        .         .         .         .
 23.31      6.7634      1.81  .Q        .         .         .         .
 23.56      6.8007      1.78  .Q        .         .         .         .
 23.81      6.8374      1.75  .Q        .         .         .         .
 24.06      6.8735      1.72  .Q        .         .         .         .
 24.32      6.8914      0.00  Q         .         .         .         .
 --------------------------------------------------------------------------
--------------------------------------------------------------------------------
   TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
   (Note: 100% of Peak Flow Rate estimate assumed to have
   an instantaneous time duration)

   Percentile of Estimated                Duration
       Peak Flow Rate                     (minutes)
   ======================                 =========
              0%                           1451.5
             10%                            151.2
             20%                             45.4
             30%                             15.1
             40%                             15.1
             50%                             15.1
             60%                             15.1
             70%                             15.1
             80%                             15.1
             90%                             15.1
```

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




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 Problem Descriptions:
  REDLANDS
  NODE 21085 TO NODE 21087
  APR 2014 DMALOTT
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   14.61
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.188
    LOW LOSS FRACTION = 0.170
    TIME OF CONCENTRATION(MIN.) = 21.58
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.46
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.95
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.25
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.03
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  2.75
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.50

------------------------------------------------------------------------------

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     5.05
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     1.65

******************************************************************************
  TIME     VOLUME       Q    0.        7.5      15.0      22.5      30.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.17      0.0000      0.00  Q         .         .         .         .
  0.53      0.0188      1.26  .Q        .         .         .         .
  0.89      0.0564      1.27  .Q        .         .         .         .
  1.25      0.0945      1.29  .Q        .         .         .         .
  1.61      0.1331      1.30  .Q        .         .         .         .
  1.97      0.1721      1.32  .Q        .         .         .         .
  2.33      0.2117      1.34  .Q        .         .         .         .
  2.69      0.2517      1.36  .Q        .         .         .         .
  3.05      0.2923      1.37  .Q        .         .         .         .
  3.41      0.3334      1.40  .Q        .         .         .         .
```



```
  3.77      0.3751      1.41  .Q        .         .         .         .
  4.13      0.4175      1.44  .Q        .         .         .         .
  4.49      0.4604      1.45  .Q        .         .         .         .
  4.85      0.5040      1.48  .Q        .         .         .         .
  5.21      0.5483      1.50  .Q        .         .         .         .
  5.57      0.5933      1.53  . Q       .         .         .         .
  5.93      0.6391      1.55  . Q       .         .         .         .
  6.29      0.6857      1.59  . Q       .         .         .         .
  6.65      0.7331      1.61  . Q       .         .         .         .
  7.01      0.7814      1.65  . Q       .         .         .         .
  7.37      0.8307      1.67  . Q       .         .         .         .
  7.73      0.8810      1.71  . Q       .         .         .         .
  8.09      0.9323      1.74  . Q       .         .         .         .
  8.45      0.9848      1.79  . Q       .         .         .         .
  8.81      1.0385      1.82  . Q       .         .         .         .
  9.17      1.0935      1.88  . Q       .         .         .         .
  9.53      1.1499      1.91  . Q       .         .         .         .
  9.89      1.2078      1.98  . Q       .         .         .         .
 10.25      1.2674      2.02  . Q       .         .         .         .
 10.60      1.3288      2.11  . Q       .         .         .         .
 10.96      1.3921      2.15  . Q       .         .         .         .
 11.32      1.4576      2.26  .  Q      .         .         .         .
 11.68      1.5255      2.31  .  Q      .         .         .         .
 12.04      1.5962      2.44  .  Q      .         .         .         .
 12.40      1.6667      2.30  .  Q      .         .         .         .
 12.76      1.7362      2.37  .  Q      .         .         .         .
 13.12      1.8081      2.47  .  Q      .         .         .         .
 13.48      1.8849      2.70  .  Q      .         .         .         .
 13.84      1.9673      2.84  .  Q      .         .         .         .
 14.20      2.0573      3.21  .   Q     .         .         .         .
 14.56      2.1564      3.46  .   Q     .         .         .         .
 14.92      2.2691      4.12  .    Q    .         .         .         .
 15.28      2.3988      4.61  .     Q   .         .         .         .
 15.64      2.5555      5.93  .      Q  .         .         .         .
 16.00      2.7635      8.06  .         Q         .         .         .
 16.36      3.2983     27.92  .         .         .         .         Q .
 16.72      3.7923      5.31  .      Q  .         .         .         .
 17.08      3.9269      3.75  .   Q     .         .         .         .
 17.44      4.0274      3.01  .   Q     .         .         .         .
 17.80      4.1104      2.58  .  Q      .         .         .         .
 18.16      4.1826      2.28  .  Q      .         .         .         .
 18.52      4.2518      2.38  .  Q      .         .         .         .
 18.88      4.3199      2.20  . Q       .         .         .         .
 19.24      4.3833      2.06  . Q       .         .         .         .
 19.60      4.4429      1.95  . Q       .         .         .         .
 19.96      4.4994      1.85  . Q       .         .         .         .
 20.32      4.5531      1.76  . Q       .         .         .         .
 20.68      4.6045      1.69  . Q       .         .         .         .
 21.04      4.6537      1.63  . Q       .         .         .         .
 21.39      4.7012      1.57  . Q       .         .         .         .
 21.75      4.7470      1.51  . Q       .         .         .         .
 22.11      4.7913      1.47  .Q        .         .         .         .
 22.47      4.8342      1.42  .Q        .         .         .         .
 22.83      4.8760      1.38  .Q        .         .         .         .
 23.19      4.9166      1.35  .Q        .         .         .         .
 23.55      4.9561      1.31  .Q        .         .         .         .
 23.91      4.9947      1.28  .Q        .         .         .         .
 24.27      5.0324      1.25  .Q        .         .         .         .
```

```
 24.63      5.0510      0.00  Q         .         .         .         .
 ------------------------------------------------------------------------------
-------------------------------------------------------------------------------
    TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
    (Note: 100% of Peak Flow Rate estimate assumed to have
    an instantaneous time duration)

    Percentile of Estimated                Duration
        Peak Flow Rate                     (minutes)
    ======================                 =========
               0%                           1445.9
              10%                            237.4
              20%                             64.7
              30%                             21.6
              40%                             21.6
              50%                             21.6
              60%                             21.6
              70%                             21.6
              80%                             21.6
              90%                             21.6
```

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

                              RBF Consulting
                            14257 Alton Parkway
                                 Irvine, CA
                                   92618

******************************************************************************
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 Problem Descriptions:
  REDLANDS
  NODE 21090 TO NODE 21093
  APR 2014 DMALOTT
------------------------------------------------------------------------------


    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =    7.44
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.075
    LOW LOSS FRACTION = 0.093
    TIME OF CONCENTRATION(MIN.) =  9.46
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.46
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.95
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.25
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.03
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  2.75
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.50

------------------------------------------------------------------------------

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =     2.79
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     0.62

******************************************************************************
  TIME     VOLUME       Q    0.        7.5      15.0      22.5      30.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.08      0.0022      0.70  Q         .         .         .         .
  0.23      0.0113      0.70  Q         .         .         .         .
  0.39      0.0204      0.70  Q         .         .         .         .
  0.55      0.0295      0.70  Q         .         .         .         .
  0.71      0.0388      0.71  Q         .         .         .         .
  0.86      0.0480      0.71  Q         .         .         .         .
  1.02      0.0573      0.72  Q         .         .         .         .
  1.18      0.0667      0.72  Q         .         .         .         .
  1.34      0.0761      0.72  Q         .         .         .         .
  1.49      0.0855      0.73  Q         .         .         .         .
```



```
  1.65      0.0950      0.73  Q         .         .         .         .
  1.81      0.1046      0.73  Q         .         .         .         .
  1.97      0.1142      0.74  Q         .         .         .         .
  2.13      0.1239      0.74  Q         .         .         .         .
  2.28      0.1336      0.75  Q         .         .         .         .
  2.44      0.1434      0.75  .Q        .         .         .         .
  2.60      0.1532      0.76  .Q        .         .         .         .
  2.76      0.1631      0.76  .Q        .         .         .         .
  2.91      0.1730      0.77  .Q        .         .         .         .
  3.07      0.1830      0.77  .Q        .         .         .         .
  3.23      0.1931      0.78  .Q        .         .         .         .
  3.39      0.2032      0.78  .Q        .         .         .         .
  3.54      0.2134      0.79  .Q        .         .         .         .
  3.70      0.2237      0.79  .Q        .         .         .         .
  3.86      0.2340      0.80  .Q        .         .         .         .
  4.02      0.2444      0.80  .Q        .         .         .         .
  4.18      0.2549      0.81  .Q        .         .         .         .
  4.33      0.2654      0.81  .Q        .         .         .         .
  4.49      0.2760      0.82  .Q        .         .         .         .
  4.65      0.2866      0.82  .Q        .         .         .         .
  4.81      0.2974      0.83  .Q        .         .         .         .
  4.96      0.3082      0.83  .Q        .         .         .         .
  5.12      0.3191      0.84  .Q        .         .         .         .
  5.28      0.3301      0.84  .Q        .         .         .         .
  5.44      0.3411      0.85  .Q        .         .         .         .
  5.59      0.3522      0.86  .Q        .         .         .         .
  5.75      0.3635      0.87  .Q        .         .         .         .
  5.91      0.3748      0.87  .Q        .         .         .         .
  6.07      0.3861      0.88  .Q        .         .         .         .
  6.22      0.3976      0.88  .Q        .         .         .         .
  6.38      0.4092      0.89  .Q        .         .         .         .
  6.54      0.4209      0.90  .Q        .         .         .         .
  6.70      0.4326      0.91  .Q        .         .         .         .
  6.86      0.4445      0.91  .Q        .         .         .         .
  7.01      0.4564      0.92  .Q        .         .         .         .
  7.17      0.4685      0.93  .Q        .         .         .         .
  7.33      0.4807      0.94  .Q        .         .         .         .
  7.49      0.4930      0.95  .Q        .         .         .         .
  7.64      0.5053      0.96  .Q        .         .         .         .
  7.80      0.5179      0.96  .Q        .         .         .         .
  7.96      0.5305      0.98  .Q        .         .         .         .
  8.12      0.5432      0.98  .Q        .         .         .         .
  8.27      0.5561      0.99  .Q        .         .         .         .
  8.43      0.5691      1.00  .Q        .         .         .         .
  8.59      0.5823      1.02  .Q        .         .         .         .
  8.75      0.5955      1.02  .Q        .         .         .         .
  8.90      0.6090      1.04  .Q        .         .         .         .
  9.06      0.6225      1.05  .Q        .         .         .         .
  9.22      0.6362      1.06  .Q        .         .         .         .
  9.38      0.6501      1.07  .Q        .         .         .         .
  9.54      0.6642      1.09  .Q        .         .         .         .
  9.69      0.6784      1.09  .Q        .         .         .         .
  9.85      0.6928      1.11  .Q        .         .         .         .
 10.01      0.7073      1.12  .Q        .         .         .         .
 10.17      0.7221      1.14  .Q        .         .         .         .
 10.32      0.7370      1.15  .Q        .         .         .         .
 10.48      0.7522      1.17  .Q        .         .         .         .
 10.64      0.7675      1.18  .Q        .         .         .         .
```

10.80	0.7831	1.21	.Q	.	.	.	.	
10.95	0.7990	1.22	.Q	.	.	.	.	
11.11	0.8150	1.25	.Q	.	.	.	.	
11.27	0.8313	1.26	.Q	.	.	.	.	
11.43	0.8479	1.29	.Q	.	.	.	.	
11.59	0.8648	1.30	.Q	.	.	.	.	
11.74	0.8820	1.33	.Q	.	.	.	.	
11.90	0.8994	1.35	.Q	.	.	.	.	
12.06	0.9172	1.37	.Q	.	.	.	.	
12.22	0.9341	1.23	.Q	.	.	.	.	
12.37	0.9504	1.27	.Q	.	.	.	.	
12.53	0.9671	1.29	.Q	.	.	.	.	
12.69	0.9841	1.33	.Q	.	.	.	.	
12.85	1.0017	1.36	.Q	.	.	.	.	
13.00	1.0197	1.41	.Q	.	.	.	.	
13.16	1.0382	1.43	.Q	.	.	.	.	
13.32	1.0572	1.49	.Q	.	.	.	.	
13.48	1.0769	1.53	. Q	.	.	.	.	
13.63	1.0973	1.60	. Q	.	.	.	.	
13.79	1.1184	1.64	. Q	.	.	.	.	
13.95	1.1403	1.73	. Q	.	.	.	.	
14.11	1.1631	1.78	. Q	.	.	.	.	
14.27	1.1871	1.90	. Q	.	.	.	.	
14.42	1.2122	1.96	. Q	.	.	.	.	
14.58	1.2388	2.11	. Q	.	.	.	.	
14.74	1.2669	2.20	. Q	.	.	.	.	
14.90	1.2968	2.40	. Q	.	.	.	.	
15.05	1.3290	2.53	. Q	.	.	.	.	
15.21	1.3640	2.85	. Q	.	.	.	.	
15.37	1.4024	3.05	. Q	.	.	.	.	
15.53	1.4437	3.28	. Q	.	.	.	.	
15.68	1.4892	3.71	. Q	.	.	.	.	
15.84	1.5490	5.47	. Q	.	.	.	.	
16.00	1.6347	7.69	. Q	.	.	.	.	
16.16	1.8463	24.79	.	.	.	.	Q	.
16.32	2.0360	4.34	. Q	.	.	.	.	
16.47	2.0851	3.19	. Q	.	.	.	.	
16.63	2.1233	2.67	. Q	.	.	.	.	
16.79	2.1556	2.29	. Q	.	.	.	.	
16.95	2.1838	2.03	. Q	.	.	.	.	
17.10	2.2091	1.84	. Q	.	.	.	.	
17.26	2.2320	1.68	. Q	.	.	.	.	
17.42	2.2532	1.56	. Q	.	.	.	.	
17.58	2.2729	1.46	.Q	.	.	.	.	
17.73	2.2914	1.38	.Q	.	.	.	.	
17.89	2.3089	1.31	.Q	.	.	.	.	
18.05	2.3256	1.25	.Q	.	.	.	.	
18.21	2.3426	1.37	.Q	.	.	.	.	
18.36	2.3601	1.32	.Q	.	.	.	.	
18.52	2.3770	1.27	.Q	.	.	.	.	
18.68	2.3933	1.23	.Q	.	.	.	.	
18.84	2.4091	1.20	.Q	.	.	.	.	
19.00	2.4245	1.16	.Q	.	.	.	.	
19.15	2.4395	1.13	.Q	.	.	.	.	
19.31	2.4540	1.10	.Q	.	.	.	.	
19.47	2.4682	1.08	.Q	.	.	.	.	
19.63	2.4821	1.05	.Q	.	.	.	.	
19.78	2.4957	1.03	.Q	.	.	.	.	

19.94	2.5090	1.01	.Q	.	.	.	.	
20.10	2.5220	0.99	.Q	.	.	.	.	
20.26	2.5347	0.97	.Q	.	.	.	.	
20.41	2.5472	0.95	.Q	.	.	.	.	
20.57	2.5595	0.93	.Q	.	.	.	.	
20.73	2.5716	0.92	.Q	.	.	.	.	
20.89	2.5834	0.90	.Q	.	.	.	.	
21.05	2.5951	0.89	.Q	.	.	.	.	
21.20	2.6066	0.87	.Q	.	.	.	.	
21.36	2.6179	0.86	.Q	.	.	.	.	
21.52	2.6290	0.85	.Q	.	.	.	.	
21.68	2.6400	0.84	.Q	.	.	.	.	
21.83	2.6508	0.82	.Q	.	.	.	.	
21.99	2.6615	0.81	.Q	.	.	.	.	
22.15	2.6720	0.80	.Q	.	.	.	.	
22.31	2.6824	0.79	.Q	.	.	.	.	
22.46	2.6926	0.78	.Q	.	.	.	.	
22.62	2.7028	0.77	.Q	.	.	.	.	
22.78	2.7128	0.76	.Q	.	.	.	.	
22.94	2.7227	0.75	.Q	.	.	.	.	
23.09	2.7324	0.75	Q	.	.	.	.	
23.25	2.7421	0.74	Q	.	.	.	.	
23.41	2.7517	0.73	Q	.	.	.	.	
23.57	2.7611	0.72	Q	.	.	.	.	
23.73	2.7705	0.71	Q	.	.	.	.	
23.88	2.7797	0.71	Q	.	.	.	.	
24.04	2.7889	0.70	Q	.	.	.	.	
24.20	2.7935	0.00	Q	.	.	.	.	

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1447.4
10%	104.1
20%	28.4
30%	18.9
40%	9.5
50%	9.5
60%	9.5
70%	9.5
80%	9.5
90%	9.5

```
******************************************************************************
                    SMALL AREA UNIT HYDROGRAPH MODEL
==============================================================================
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             Ver. 18.0  Release Date: 05/01/2011  License ID 1264

                          Analysis prepared by:




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------------------------------------------------------------------------------

 Problem Descriptions:
  REDLANDS
  NODE 21087 TO NODE 21097
  APR 2014 DMALOTT
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    RATIONAL METHOD CALIBRATION COEFFICIENT = 0.90
    TOTAL CATCHMENT AREA(ACRES) =   66.18
    SOIL-LOSS RATE, Fm,(INCH/HR) =  0.210
    LOW LOSS FRACTION = 0.193
    TIME OF CONCENTRATION(MIN.) = 16.53
    SMALL AREA PEAK Q COMPUTED USING PEAK FLOW RATE FORMULA
    USER SPECIFIED RAINFALL VALUES ARE USED
    RETURN FREQUENCY(YEARS) = 100
       5-MINUTE POINT RAINFALL VALUE(INCHES) =  0.46
      30-MINUTE POINT RAINFALL VALUE(INCHES) =  0.95
       1-HOUR   POINT RAINFALL VALUE(INCHES) =  1.25
       3-HOUR   POINT RAINFALL VALUE(INCHES) =  2.03
       6-HOUR   POINT RAINFALL VALUE(INCHES) =  2.75
      24-HOUR   POINT RAINFALL VALUE(INCHES) =  5.50

------------------------------------------------------------------------------

    TOTAL CATCHMENT   RUNOFF  VOLUME(ACRE-FEET) =    22.38
    TOTAL CATCHMENT SOIL-LOSS VOLUME(ACRE-FEET) =     7.95

******************************************************************************
  TIME     VOLUME       Q    0.       37.5      75.0     112.5     150.0
 (HOURS)    (AF)      (CFS)
------------------------------------------------------------------------------
  0.02      0.0000      0.00  Q        .         .         .         .
  0.30      0.0629      5.53  .Q       .         .         .         .
  0.57      0.1891      5.56  .Q       .         .         .         .
  0.85      0.3165      5.63  .Q       .         .         .         .
  1.12      0.4449      5.66  .Q       .         .         .         .
  1.40      0.5746      5.73  .Q       .         .         .         .
  1.67      0.7055      5.77  .Q       .         .         .         .
  1.95      0.8376      5.84  .Q       .         .         .         .
  2.22      0.9709      5.88  .Q       .         .         .         .
  2.50      1.1057      5.96  .Q       .         .         .         .
```



```
  2.78      1.2417      6.00  .Q       .         .         .         .
  3.05      1.3792      6.08  .Q       .         .         .         .
  3.33      1.5181      6.12  .Q       .         .         .         .
  3.60      1.6585      6.21  .Q       .         .         .         .
  3.88      1.8004      6.26  .Q       .         .         .         .
  4.15      1.9440      6.35  .Q       .         .         .         .
  4.43      2.0892      6.40  .Q       .         .         .         .
  4.70      2.2361      6.50  .Q       .         .         .         .
  4.98      2.3847      6.55  .Q       .         .         .         .
  5.26      2.5352      6.66  .Q       .         .         .         .
  5.53      2.6876      6.72  .Q       .         .         .         .
  5.81      2.8419      6.84  .Q       .         .         .         .
  6.08      2.9984      6.90  .Q       .         .         .         .
  6.36      3.1569      7.03  .Q       .         .         .         .
  6.63      3.3177      7.09  .Q       .         .         .         .
  6.91      3.4808      7.23  .Q       .         .         .         .
  7.18      3.6464      7.31  .Q       .         .         .         .
  7.46      3.8144      7.46  .Q       .         .         .         .
  7.73      3.9852      7.54  . Q      .         .         .         .
  8.01      4.1587      7.71  . Q      .         .         .         .
  8.29      4.3352      7.79  . Q      .         .         .         .
  8.56      4.5148      7.98  . Q      .         .         .         .
  8.84      4.6976      8.08  . Q      .         .         .         .
  9.11      4.8839      8.28  . Q      .         .         .         .
  9.39      5.0737      8.39  . Q      .         .         .         .
  9.66      5.2675      8.63  . Q      .         .         .         .
  9.94      5.4654      8.75  . Q      .         .         .         .
 10.21      5.6677      9.02  . Q      .         .         .         .
 10.49      5.8746      9.16  . Q      .         .         .         .
 10.77      6.0866      9.46  . Q      .         .         .         .
 11.04      6.3040      9.63  . Q      .         .         .         .
 11.32      6.5273      9.99  . Q      .         .         .         .
 11.59      6.7569     10.18  . Q      .         .         .         .
 11.87      6.9935     10.60  . Q      .         .         .         .
 12.14      7.2376     10.84  . Q      .         .         .         .
 12.42      7.4747      9.98  . Q      .         .         .         .
 12.69      7.7052     10.27  . Q      .         .         .         .
 12.97      7.9463     10.91  . Q      .         .         .         .
 13.24      8.1989     11.28  .  Q     .         .         .         .
 13.52      8.4654     12.13  .  Q     .         .         .         .
 13.80      8.7472     12.63  .  Q     .         .         .         .
 14.07      9.0483     13.82  .  Q     .         .         .         .
 14.35      9.3723     14.64  .  Q     .         .         .         .
 14.62      9.7268     16.49  .   Q    .         .         .         .
 14.90     10.1159     17.69  .   Q    .         .         .         .
 15.17     10.5570     21.05  .    Q   .         .         .         .
 15.45     11.0649     23.56  .     Q  .         .         .         .
 15.72     11.6745     29.99  .      Q .         .         .         .
 16.00     12.4945     42.03  .        .Q       .         .         .
 16.28     14.6675    148.85  .         .       .         .        Q.
 16.55     16.6512     25.40  .     Q   .         .         .         .
 16.83     17.1586     19.17  .    Q    .         .         .         .
 17.10     17.5533     15.50  .   Q     .         .         .         .
 17.38     17.8798     13.18  .  Q      .         .         .         .
 17.65     18.1629     11.68  .  Q      .         .         .         .
 17.93     18.4163     10.58  . Q       .         .         .         .
 18.20     18.6508     10.02  . Q       .         .         .         .
 18.48     18.8831     10.39  . Q       .         .         .         .
```

18.76	19.1130	9.80	. Q	.	.	.	.
19.03	19.3306	9.31	. Q	.	.	.	.
19.31	19.5376	8.88	. Q	.	.	.	.
19.58	19.7356	8.51	. Q	.	.	.	.
19.86	19.9256	8.18	. Q	.	.	.	.
20.13	20.1085	7.89	. Q	.	.	.	.
20.41	20.2850	7.62	. Q	.	.	.	.
20.68	20.4558	7.38	.Q	.	.	.	.
20.96	20.6214	7.16	.Q	.	.	.	.
21.23	20.7822	6.96	.Q	.	.	.	.
21.51	20.9387	6.78	.Q	.	.	.	.
21.79	21.0911	6.61	.Q	.	.	.	.
22.06	21.2398	6.45	.Q	.	.	.	.
22.34	21.3850	6.30	.Q	.	.	.	.
22.61	21.5269	6.17	.Q	.	.	.	.
22.89	21.6659	6.04	.Q	.	.	.	.
23.16	21.8019	5.92	.Q	.	.	.	.
23.44	21.9353	5.80	.Q	.	.	.	.
23.71	22.0662	5.69	.Q	.	.	.	.
23.99	22.1947	5.59	.Q	.	.	.	.
24.27	22.3211	5.51	.Q	.	.	.	.
24.54	22.3838	0.00	Q	.	.	.	.

TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
(Note: 100% of Peak Flow Rate estimate assumed to have
an instantaneous time duration)

Percentile of Estimated Peak Flow Rate	Duration (minutes)
0%	1454.6
10%	165.3
20%	49.6
30%	16.5
40%	16.5
50%	16.5
60%	16.5
70%	16.5
80%	16.5
90%	16.5