Attachment 5 – Updated Rational Method Hydrology Calculations Q10

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*************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
              (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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                Ver. 23.0  Release Date: 07/01/2016  License ID 1355

                         Analysis prepared by:
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  ************************ DESCRIPTION OF STUDY ************************
* SANTA ANA MPD - GARDEN WATERSHED                                      *
* RATIONAL METHOD HYDROLOGY - EXISTING CONDITION-UPDATED 1-2023         *
* 10-YEAR SEPTEMBER 2014 KCHAN REV FEB 2015 MCHANDOO REV DEC 2022 SAUSILI *
  *********************************************************************
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  FILE NAME: GC10EX.DAT
  TIME/DATE OF STUDY: 18:07 01/18/2023
===============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
===============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  18.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*
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  *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   20.0    10.0     0.020/0.020/0.020   0.50   2.00 0.0313 0.125 0.0150
  2   42.0    21.0     0.020/0.020/0.020   0.67   2.00 0.0313 0.167 0.0150
  3   51.0    25.0     0.020/0.020/0.020   0.67   2.00 0.0313 0.167 0.0150
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  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 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
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  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
-------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
===============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    330.00
  ELEVATION DATA: UPSTREAM(FEET) =     108.00  DOWNSTREAM(FEET) =    106.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
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   SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.586
   * 10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.978
   SUBAREA Tc 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"        C       1.40     0.25     0.500    69   10.99
   COMMERCIAL                  C       1.50     0.25     0.100    69    8.59
   URBAN POOR COVER
   "TURF"                      C       0.20     0.25     1.000    83   14.83
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.339
   SUBAREA RUNOFF(CFS) =      8.07
   TOTAL AREA(ACRES) =      3.10   PEAK FLOW RATE(CFS) =      8.07


***************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  62
---------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
===========================================================================
  UPSTREAM ELEVATION(FEET) =  106.00  DOWNSTREAM ELEVATION(FEET) =  100.00
  STREET LENGTH(FEET) =   641.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.77
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.43
    HALFSTREET FLOOD WIDTH(FEET) =   15.66
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.84
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.22
  STREET FLOW TRAVEL TIME(MIN.) =   3.76   Tc(MIN.) =   12.35
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.418
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp        Ap    SCS
       LAND USE            GROUP    (ACRES)  (INCH/HR) (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"        C       5.00     0.25     0.500    69
  COMMERCIAL                  C       1.40     0.25     0.100    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.413
  SUBAREA AREA(ACRES) =    6.40      SUBAREA RUNOFF(CFS) =   13.33
  EFFECTIVE AREA(ACRES) =      9.50    AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.39
  TOTAL AREA(ACRES) =       9.5       PEAK FLOW RATE(CFS) =      19.84

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.47   HALFSTREET FLOOD WIDTH(FEET) =  17.62
  FLOW VELOCITY(FEET/SEC.) = 3.05   DEPTH*VELOCITY(FT*FT/SEC.) =   1.43
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =     971.00 FEET.
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  FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  62
-------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
=============================================================================
  UPSTREAM ELEVATION(FEET) =  100.00  DOWNSTREAM ELEVATION(FEET) =   92.00
  STREET LENGTH(FEET) =  1712.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      38.72
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.62
    HALFSTREET FLOOD WIDTH(FEET) =   26.03
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.93
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.82
  STREET FLOW TRAVEL TIME(MIN.) =   9.73   Tc(MIN.) =   22.08
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.733
  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      16.80     0.30     0.500    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       C       2.80     0.25     0.500    69
  COMMERCIAL                 B       4.40     0.30     0.100    56
  COMMERCIAL                 C       1.60     0.25     0.100    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.406
  SUBAREA AREA(ACRES) =   25.60       SUBAREA RUNOFF(CFS) =   37.20
  EFFECTIVE AREA(ACRES) =    35.10    AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.28  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =      35.1         PEAK FLOW RATE(CFS) =     51.19

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.67   HALFSTREET FLOOD WIDTH(FEET) =  28.72
  FLOW VELOCITY(FEET/SEC.) =  3.17   DEPTH*VELOCITY(FT*FT/SEC.) =   2.14
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1712.0 FT WITH ELEVATION-DROP =   8.0 FT, IS   42.9 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    103.00
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =   2683.00 FEET.

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  FLOW PROCESS FROM NODE    103.00 TO NODE    109.00 IS CODE =  62
-------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
=============================================================================
  UPSTREAM ELEVATION(FEET) =   92.00  DOWNSTREAM ELEVATION(FEET) =   86.00
  STREET LENGTH(FEET) =  2064.00   CURB HEIGHT(INCHES) =  8.0
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   STREET HALFWIDTH(FEET) = 42.00

   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  21.00
   INSIDE STREET CROSSFALL(DECIMAL) =  0.020
   OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
   STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      89.58
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) =  0.93
     HALFSTREET FLOOD WIDTH(FEET) =   52.10
     AVERAGE FLOW VELOCITY(FEET/SEC.) =     2.64
     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =     2.46
   STREET FLOW TRAVEL TIME(MIN.) =  13.05   Tc(MIN.) =   35.13
   *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.328
   SUBAREA LOSS RATE DATA(AMC  II):
    DEVELOPMENT TYPE/       SCS SOIL    AREA      Fp        Ap     SCS
        LAND USE           GROUP    (ACRES)  (INCH/HR) (DECIMAL)  CN
   RESIDENTIAL
   "5-7 DWELLINGS/ACRE"       B       19.80     0.30      0.500    56
   RESIDENTIAL
   "5-7 DWELLINGS/ACRE"       C       30.00     0.25      0.500    69
   COMMERCIAL                 B        7.20     0.30      0.100    56
   COMMERCIAL                 C       11.30     0.25      0.100    69
   URBAN POOR COVER
   "TURF"                     C        1.20     0.25      1.000    83
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.402
   SUBAREA AREA(ACRES) =   69.50       SUBAREA RUNOFF(CFS) =   76.33
   EFFECTIVE AREA(ACRES) =    104.60    AREA-AVERAGED Fm(INCH/HR) =  0.11
   AREA-AVERAGED Fp(INCH/HR) =  0.27  AREA-AVERAGED Ap =  0.40
   TOTAL AREA(ACRES) =      104.6         PEAK FLOW RATE(CFS) =      114.72

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 1.00   HALFSTREET FLOOD WIDTH(FEET) =  58.73
   FLOW VELOCITY(FEET/SEC.) =  2.76   DEPTH*VELOCITY(FT*FT/SEC.) =   2.77
   *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 2064.0 FT WITH ELEVATION-DROP =   6.0 FT, IS  105.7 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    109.00
   LONGEST FLOWPATH FROM NODE    100.00 TO NODE    109.00 =    4747.00 FEET.

   **************************************************************************
     FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 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.) =   35.13
     RAINFALL INTENSITY(INCH/HR) =   1.33
     AREA-AVERAGED Fm(INCH/HR) =  0.11
     AREA-AVERAGED Fp(INCH/HR) =  0.27
     AREA-AVERAGED Ap =  0.40
     EFFECTIVE STREAM AREA(ACRES) =      104.60
     TOTAL STREAM AREA(ACRES) =      104.60
     PEAK FLOW RATE(CFS) AT CONFLUENCE =      114.72
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***************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    105.00 IS CODE =  21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
===============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =     92.50  DOWNSTREAM(FEET) =     92.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.329
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.541
  SUBAREA Tc 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       2.00     0.30     0.500    56   14.50
  COMMERCIAL                B       0.80     0.30     0.100    56   11.33
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.386
  SUBAREA RUNOFF(CFS) =      6.11
  TOTAL AREA(ACRES) =      2.80   PEAK FLOW RATE(CFS) =       6.11

***************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    106.00 IS CODE =  62
-------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
===============================================================================
  UPSTREAM ELEVATION(FEET) =   92.00  DOWNSTREAM ELEVATION(FEET) =   90.00
  STREET LENGTH(FEET) =   650.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.65
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.47
    HALFSTREET FLOOD WIDTH(FEET) =   17.77
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.76
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.83
  STREET FLOW TRAVEL TIME(MIN.) =   6.15   Tc(MIN.) =   17.48
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.982
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/     SCS SOIL   AREA      Fp        Ap     SCS
       LAND USE          GROUP   (ACRES)  (INCH/HR) (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"      B       5.40     0.30     0.500    56
  COMMERCIAL                B       1.20     0.30     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.427
  SUBAREA AREA(ACRES) =   6.60       SUBAREA RUNOFF(CFS) =   11.01
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  EFFECTIVE AREA(ACRES) =   9.40   AREA-AVERAGED Fm(INCH/HR) = 0.12
  AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.41
  TOTAL AREA(ACRES) =   9.4   PEAK FLOW RATE(CFS) =   15.71

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.52   HALFSTREET FLOOD WIDTH(FEET) = 20.84
  FLOW VELOCITY(FEET/SEC.) = 1.89   DEPTH*VELOCITY(FT*FT/SEC.) =   0.97
  LONGEST FLOWPATH FROM NODE   104.00 TO NODE   106.00 =   980.00 FEET.

  ****
  FLOW PROCESS FROM NODE   106.00 TO NODE   107.00 IS CODE = 62

  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 1 USED)<<<<<
  ==
  UPSTREAM ELEVATION(FEET) =   90.00 DOWNSTREAM ELEVATION(FEET) =   88.00
  STREET LENGTH(FEET) =   712.00   CURB HEIGHT(INCHES) = 6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   26.08
    STREET FLOWING FULL
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) = 0.60
    HALFSTREET FLOOD WIDTH(FEET) =   24.81
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   2.18
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.30
  STREET FLOW TRAVEL TIME(MIN.) =   5.44   Tc(MIN.) =   22.92
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.697
  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   11.20   0.30   0.500   56
  COMMERCIAL   B   3.40   0.30   0.100   56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.407
  SUBAREA AREA(ACRES) =   14.60   SUBAREA RUNOFF(CFS) =   20.69
  EFFECTIVE AREA(ACRES) =   24.00   AREA-AVERAGED Fm(INCH/HR) = 0.12
  AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.41
  TOTAL AREA(ACRES) =   24.0   PEAK FLOW RATE(CFS) =   33.99

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.64   HALFSTREET FLOOD WIDTH(FEET) = 27.19
  FLOW VELOCITY(FEET/SEC.) = 2.36   DEPTH*VELOCITY(FT*FT/SEC.) =   1.52
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 712.0 FT WITH ELEVATION-DROP =   2.0 FT, IS   28.4 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   107.00
  LONGEST FLOWPATH FROM NODE   104.00 TO NODE   107.00 =   1692.00 FEET.

  ****
  FLOW PROCESS FROM NODE   107.00 TO NODE   108.00 IS CODE = 62

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  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
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  UPSTREAM ELEVATION(FEET) =   88.00  DOWNSTREAM ELEVATION(FEET) =   87.00
  STREET LENGTH(FEET) =   293.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      52.60
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.71
    HALFSTREET FLOOD WIDTH(FEET) =   30.67
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.85
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.03
  STREET FLOW TRAVEL TIME(MIN.) =   1.71   Tc(MIN.) =   24.63
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.628
  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       20.20      0.30      0.500     56
  COMMERCIAL                 B        7.20      0.30      0.100     56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.395
  SUBAREA AREA(ACRES) =   27.40       SUBAREA RUNOFF(CFS) =   37.22
  EFFECTIVE AREA(ACRES) =     51.40    AREA-AVERAGED Fm(INCH/HR) =  0.12
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =        51.4        PEAK FLOW RATE(CFS) =      69.73

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.78   HALFSTREET FLOOD WIDTH(FEET) =  34.03
  FLOW VELOCITY(FEET/SEC.) =  3.06   DEPTH*VELOCITY(FT*FT/SEC.) =   2.39
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  293.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   67.7 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE     108.00
  LONGEST FLOWPATH FROM NODE    104.00 TO NODE    108.00 =   1985.00 FEET.
```

```
**************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    109.00 IS CODE =  62
```

```
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
```
==
```
  UPSTREAM ELEVATION(FEET) =   87.00  DOWNSTREAM ELEVATION(FEET) =   86.00
  STREET LENGTH(FEET) =   533.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

```
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      87.60
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.93
   HALFSTREET FLOOD WIDTH(FEET) =   41.60
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.56
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.38
 STREET FLOW TRAVEL TIME(MIN.) =   3.47   Tc(MIN.) =   28.11
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.509
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL    AREA      Fp        Ap     SCS
      LAND USE           GROUP    (ACRES)  (INCH/HR) (DECIMAL)  CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"        B      12.00     0.30     0.500    56
 COMMERCIAL                  B       6.10     0.30     0.100    56
 URBAN POOR COVER
 "TURF"                      B       4.50     0.30     1.000    74
 SCHOOL                      B       6.70     0.30     0.600    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.516
 SUBAREA AREA(ACRES) =   29.30      SUBAREA RUNOFF(CFS) =   35.72
 EFFECTIVE AREA(ACRES) =      80.70    AREA-AVERAGED Fm(INCH/HR) =  0.13
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.44
 TOTAL AREA(ACRES) =       80.7       PEAK FLOW RATE(CFS) =      99.97

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.98   HALFSTREET FLOOD WIDTH(FEET) = 43.79
 FLOW VELOCITY(FEET/SEC.) = 2.63   DEPTH*VELOCITY(FT*FT/SEC.) =   2.57
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  533.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   57.4 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    109.00
 LONGEST FLOWPATH FROM NODE    104.00 TO NODE    109.00 =    2518.00 FEET.

 *************************************************************************
   FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 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.) =   28.11
  RAINFALL INTENSITY(INCH/HR) =   1.51
  AREA-AVERAGED Fm(INCH/HR) =  0.13
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.44
  EFFECTIVE STREAM AREA(ACRES) =      80.70
  TOTAL STREAM AREA(ACRES) =      80.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      99.97

  ** CONFLUENCE DATA **
   STREAM      Q     Tc   Intensity  Fp(Fm)    Ap     Ae    HEADWATER
   NUMBER    (CFS) (MIN.) (INCH/HR) (INCH/HR)       (ACRES)   NODE
      1     114.72  35.13    1.328  0.27( 0.11) 0.40    104.6    100.00
```

```
      2       99.97   28.11    1.509  0.30( 0.13) 0.44      80.7     104.00
```

  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      205.40  28.11    1.509  0.29( 0.12) 0.42     164.4    104.00
    2      201.54  35.13    1.328  0.29( 0.12) 0.42     185.3    100.00
```

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   205.40   Tc(MIN.) =   28.11
  EFFECTIVE AREA(ACRES) =   164.39   AREA-AVERAGED Fm(INCH/HR) = 0.12
  AREA-AVERAGED Fp(INCH/HR) = 0.29 AREA-AVERAGED Ap = 0.42
  TOTAL AREA(ACRES) =   185.3
  LONGEST FLOWPATH FROM NODE   100.00 TO NODE   109.00 =   4747.00 FEET.

****
  FLOW PROCESS FROM NODE   109.00 TO NODE   115.00 IS CODE = 31

  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==
  ELEVATION DATA: UPSTREAM(FEET) =   86.00 DOWNSTREAM(FEET) =   85.50
  FLOW LENGTH(FEET) = 1021.00   MANNING'S N = 0.013
  DEPTH OF FLOW IN 102.0 INCH PIPE IS 76.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.50
  ESTIMATED PIPE DIAMETER(INCH) = 102.00   NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =   205.40
  PIPE TRAVEL TIME(MIN.) =   3.78   Tc(MIN.) =   31.89
  LONGEST FLOWPATH FROM NODE   100.00 TO NODE   115.00 =   5768.00 FEET.

****
  FLOW PROCESS FROM NODE   115.00 TO NODE   115.00 IS CODE =   1

  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==
  TOTAL NUMBER OF STREAMS = 2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
  TIME OF CONCENTRATION(MIN.) =   31.89
  RAINFALL INTENSITY(INCH/HR) =   1.40
  AREA-AVERAGED Fm(INCH/HR) = 0.12
  AREA-AVERAGED Fp(INCH/HR) = 0.29
  AREA-AVERAGED Ap = 0.42
  EFFECTIVE STREAM AREA(ACRES) =   164.39
  TOTAL STREAM AREA(ACRES) =   185.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   205.40

****
  FLOW PROCESS FROM NODE   112.00 TO NODE   113.00 IS CODE = 21

  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   281.00
  ELEVATION DATA: UPSTREAM(FEET) =   103.00 DOWNSTREAM(FEET) =   102.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   8.956
```

```
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.907
  SUBAREA Tc 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"        C       0.90     0.25     0.500    69   11.46
  COMMERCIAL                  C       1.10     0.25     0.100    69    8.96
  NATURAL FAIR COVER
  "OPEN BRUSH"                C       0.10     0.25     1.000    77   20.80
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.314
  SUBAREA RUNOFF(CFS) =      5.35
  TOTAL AREA(ACRES) =      2.10   PEAK FLOW RATE(CFS) =       5.35

****************************************************************************
  FLOW PROCESS FROM NODE    113.00 TO NODE    114.00 IS CODE =  62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  3 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =  103.00  DOWNSTREAM ELEVATION(FEET) =   96.00
  STREET LENGTH(FEET) =  1341.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 51.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  25.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      19.40
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.55
    HALFSTREET FLOOD WIDTH(FEET) =   19.48
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.43
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.33
  STREET FLOW TRAVEL TIME(MIN.) =   9.19   Tc(MIN.) =   18.14
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.940
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp        Ap     SCS
       LAND USE            GROUP    (ACRES)  (INCH/HR) (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"        B      12.10     0.30     0.500    56
  COMMERCIAL                  C       4.60     0.25     0.100    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.390
  SUBAREA AREA(ACRES) =   16.70       SUBAREA RUNOFF(CFS) =   27.42
  EFFECTIVE AREA(ACRES) =      18.80    AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.29  AREA-AVERAGED Ap =  0.38
  TOTAL AREA(ACRES) =       18.8        PEAK FLOW RATE(CFS) =      30.94

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.63   HALFSTREET FLOOD WIDTH(FEET) =  23.42
  FLOW VELOCITY(FEET/SEC.) =  2.73   DEPTH*VELOCITY(FT*FT/SEC.) =   1.71
  LONGEST FLOWPATH FROM NODE    112.00 TO NODE    114.00 =    1622.00 FEET.

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

```
  FLOW PROCESS FROM NODE    114.00 TO NODE    115.00 IS CODE =  62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =   96.00  DOWNSTREAM ELEVATION(FEET) =   85.50
  STREET LENGTH(FEET) = 2539.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      68.63
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.75
    HALFSTREET FLOOD WIDTH(FEET) =   32.68
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.27
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.46
  STREET FLOW TRAVEL TIME(MIN.) = 12.95   Tc(MIN.) =   31.09
*  10 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
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"       B       16.90     0.30     0.500    56
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"       C       19.40     0.25     0.500    69
 COMMERCIAL                 B        8.00     0.30     0.100    56
 COMMERCIAL                 C       13.50     0.25     0.100    69
 URBAN POOR COVER
 "TURF"                     C        0.10     0.25     1.000    83
 SCHOOL                     C        4.60     0.25     0.600    69
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.371
 SUBAREA AREA(ACRES) =   62.50      SUBAREA RUNOFF(CFS) =   74.50
 EFFECTIVE AREA(ACRES) =    81.30    AREA-AVERAGED Fm(INCH/HR) =  0.10
 AREA-AVERAGED Fp(INCH/HR) =  0.28  AREA-AVERAGED Ap =  0.37
 TOTAL AREA(ACRES) =       81.3        PEAK FLOW RATE(CFS) =      96.72

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.84   HALFSTREET FLOOD WIDTH(FEET) = 37.14
  FLOW VELOCITY(FEET/SEC.) = 3.55   DEPTH*VELOCITY(FT*FT/SEC.) =   2.99
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L = 2539.0 FT WITH ELEVATION-DROP =  10.5 FT, IS   94.8 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    115.00
  LONGEST FLOWPATH FROM NODE    112.00 TO NODE    115.00 =    4161.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    115.00 TO NODE    115.00 IS CODE =   1
--------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
```

```
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   31.09
  RAINFALL INTENSITY(INCH/HR) =   1.42
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.28
  AREA-AVERAGED Ap =  0.37
  EFFECTIVE STREAM AREA(ACRES) =      81.30
  TOTAL STREAM AREA(ACRES) =      81.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      96.72

  ** CONFLUENCE DATA **
```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	205.40	31.89	1.404	0.29(0.12)	0.42	164.4	104.00
1	201.54	38.92	1.253	0.29(0.12)	0.42	185.3	100.00
2	96.72	31.09	1.425	0.28(0.10)	0.37	81.3	112.00

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

  ** PEAK FLOW RATE TABLE **
```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	300.19	31.09	1.425	0.28(0.11)	0.41	241.6	112.00
2	300.62	31.89	1.404	0.28(0.12)	0.41	245.7	104.00
3	285.68	38.92	1.253	0.28(0.11)	0.41	266.6	100.00

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     300.62    Tc(MIN.) =    31.89
  EFFECTIVE AREA(ACRES) =     245.69   AREA-AVERAGED Fm(INCH/HR) =  0.12
  AREA-AVERAGED Fp(INCH/HR) =  0.28  AREA-AVERAGED Ap =  0.41
  TOTAL AREA(ACRES) =     266.6
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    115.00 =    5768.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE    115.00 TO NODE    120.00 IS CODE =  31
  ---------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     85.50  DOWNSTREAM(FEET) =     85.00
  FLOW LENGTH(FEET) =    473.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN 102.0 INCH PIPE IS  76.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.60
  ESTIMATED PIPE DIAMETER(INCH) = 102.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     300.62
  PIPE TRAVEL TIME(MIN.) =   1.19    Tc(MIN.) =   33.08
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    120.00 =    6241.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE    120.00 TO NODE    120.00 IS CODE =   1
  ---------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
=============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   33.08
  RAINFALL INTENSITY(INCH/HR) =   1.37
  AREA-AVERAGED Fm(INCH/HR) =  0.12
```

```
  AREA-AVERAGED Fp(INCH/HR) =  0.28
  AREA-AVERAGED Ap =  0.41
  EFFECTIVE STREAM AREA(ACRES) =     245.69
  TOTAL STREAM AREA(ACRES) =     266.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     300.62


**************************************************************************
  FLOW PROCESS FROM NODE    116.00 TO NODE    117.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =     88.50  DOWNSTREAM(FEET) =     88.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.329
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.541
  SUBAREA Tc 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      1.70     0.30     0.500     56   14.50
  COMMERCIAL                B      0.30     0.30     0.100     56   11.33
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.440
  SUBAREA RUNOFF(CFS) =      4.34
  TOTAL AREA(ACRES) =      2.00   PEAK FLOW RATE(CFS) =      4.34


**************************************************************************
  FLOW PROCESS FROM NODE    117.00 TO NODE    118.00 IS CODE =  62
--------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
==========================================================================
  UPSTREAM ELEVATION(FEET) =   88.00  DOWNSTREAM ELEVATION(FEET) =   87.00
  STREET LENGTH(FEET) =   506.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.76
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.45
    HALFSTREET FLOOD WIDTH(FEET) =   16.52
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.35
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.60
  STREET FLOW TRAVEL TIME(MIN.) =   6.25   Tc(MIN.) =   17.58
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.975
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp        Ap      SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR) (DECIMAL)  CN
  RESIDENTIAL
```

```
  "5-7 DWELLINGS/ACRE"        B        3.40      0.30      0.500     56
  COMMERCIAL                  B        0.70      0.30      0.100     56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.432
  SUBAREA AREA(ACRES) =    4.10      SUBAREA RUNOFF(CFS) =     6.81
  EFFECTIVE AREA(ACRES) =      6.10    AREA-AVERAGED Fm(INCH/HR) =  0.13
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.43
  TOTAL AREA(ACRES) =          6.1        PEAK FLOW RATE(CFS) =      10.13

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.48   HALFSTREET FLOOD WIDTH(FEET) = 18.40
  FLOW VELOCITY(FEET/SEC.) = 1.43   DEPTH*VELOCITY(FT*FT/SEC.) =   0.69
  LONGEST FLOWPATH FROM NODE    116.00 TO NODE    118.00 =    836.00 FEET.

***************************************************************************
  FLOW PROCESS FROM NODE    118.00 TO NODE    119.00 IS CODE =  62
-------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
===============================================================================
  UPSTREAM ELEVATION(FEET) =   87.00  DOWNSTREAM ELEVATION(FEET) =    86.00
  STREET LENGTH(FEET) =   545.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.46
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.56
    HALFSTREET FLOOD WIDTH(FEET) =   22.86
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.63
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =     0.91
  STREET FLOW TRAVEL TIME(MIN.) =   5.57   Tc(MIN.) =   23.15
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.687
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA       Fp         Ap      SCS
       LAND USE             GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"        B        7.30      0.30      0.500     56
  COMMERCIAL                  B        1.70      0.30      0.100     56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.424
  SUBAREA AREA(ACRES) =    9.00      SUBAREA RUNOFF(CFS) =    12.63
  EFFECTIVE AREA(ACRES) =     15.10    AREA-AVERAGED Fm(INCH/HR) =  0.13
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.43
  TOTAL AREA(ACRES) =         15.1        PEAK FLOW RATE(CFS) =      21.18

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.60   HALFSTREET FLOOD WIDTH(FEET) = 24.87
  FLOW VELOCITY(FEET/SEC.) = 1.76   DEPTH*VELOCITY(FT*FT/SEC.) =   1.05
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  545.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   17.7 CFS,
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            WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE     119.00
    LONGEST FLOWPATH FROM NODE     116.00 TO NODE     119.00 =    1381.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    119.00 TO NODE    120.00 IS CODE =  62
--------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
==========================================================================
  UPSTREAM ELEVATION(FEET) =  86.00  DOWNSTREAM ELEVATION(FEET) =   85.00
  STREET LENGTH(FEET) =   662.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      32.20
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.70
    HALFSTREET FLOOD WIDTH(FEET) =   29.75
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.86
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.29
  STREET FLOW TRAVEL TIME(MIN.) =   5.95   Tc(MIN.) =   29.10
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.480
  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      12.90     0.30     0.500    56
  COMMERCIAL                 B       4.80     0.30     0.100    56
  URBAN POOR COVER
  "TURF"                     B       0.30     0.30     1.000    74
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.402
  SUBAREA AREA(ACRES) =   18.00       SUBAREA RUNOFF(CFS) =   22.02
  EFFECTIVE AREA(ACRES) =     33.10    AREA-AVERAGED Fm(INCH/HR) =  0.12
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.41
  TOTAL AREA(ACRES) =       33.1        PEAK FLOW RATE(CFS) =     40.38

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.75   HALFSTREET FLOOD WIDTH(FEET) =  32.32
  FLOW VELOCITY(FEET/SEC.) =  1.97   DEPTH*VELOCITY(FT*FT/SEC.) =   1.47
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  662.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   33.1 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    120.00
  LONGEST FLOWPATH FROM NODE    116.00 TO NODE    120.00 =    2043.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    120.00 TO NODE    120.00 IS CODE =   1
--------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==========================================================================
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  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   29.10
  RAINFALL INTENSITY(INCH/HR) =   1.48
  AREA-AVERAGED Fm(INCH/HR) =  0.12
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.41
  EFFECTIVE STREAM AREA(ACRES) =      33.10
  TOTAL STREAM AREA(ACRES) =      33.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      40.38

  ** CONFLUENCE DATA **
  STREAM     Q      Tc   Intensity  Fp(Fm)      Ap     Ae     HEADWATER
  NUMBER   (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)   NODE
     1     300.19  32.29   1.394  0.28( 0.11) 0.41    241.6    112.00
     1     300.62  33.08   1.375  0.28( 0.12) 0.41    245.7    104.00
     1     285.68  40.12   1.231  0.28( 0.11) 0.41    266.6    100.00
     2      40.38  29.10   1.480  0.30( 0.12) 0.41     33.1    116.00

  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     329.03  29.10   1.480  0.29( 0.12) 0.41    250.8    116.00
     2     338.02  32.29   1.394  0.29( 0.12) 0.41    274.7    112.00
     3     337.88  33.08   1.375  0.29( 0.12) 0.41    278.8    104.00
     4     318.65  40.12   1.231  0.28( 0.12) 0.41    299.7    100.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      338.02    Tc(MIN.) =    32.29
  EFFECTIVE AREA(ACRES) =     274.69   AREA-AVERAGED Fm(INCH/HR) =  0.12
  AREA-AVERAGED Fp(INCH/HR) =  0.29  AREA-AVERAGED Ap =  0.41
  TOTAL AREA(ACRES) =      299.7
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    120.00 =    6241.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    120.00 TO NODE    127.00 IS CODE =  31
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     85.00  DOWNSTREAM(FEET) =     78.00
  FLOW LENGTH(FEET) =  1464.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  78.0 INCH PIPE IS  62.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.81
  ESTIMATED PIPE DIAMETER(INCH) =  78.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      338.02
  PIPE TRAVEL TIME(MIN.) =   2.07    Tc(MIN.) =   34.35
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    127.00 =    7705.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    127.00 TO NODE    127.00 IS CODE =  10
--------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
==========================================================================

**************************************************************************
  FLOW PROCESS FROM NODE    121.00 TO NODE    122.00 IS CODE =  21
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  --------------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
   >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
  ================================================================================
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
   ELEVATION DATA: UPSTREAM(FEET) =     96.50  DOWNSTREAM(FEET) =     96.00

   Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
   SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.329
   *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.541
   SUBAREA Tc 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                 C       0.70     0.25      0.100    69   11.33
   SCHOOL                     C       0.70     0.25      0.600    69   15.35
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
   SUBAREA RUNOFF(CFS) =      3.09
   TOTAL AREA(ACRES) =      1.40   PEAK FLOW RATE(CFS) =      3.09


  ****************************************************************************
   FLOW PROCESS FROM NODE    122.00 TO NODE    123.00 IS CODE =  62
  --------------------------------------------------------------------------------
   >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
  ================================================================================
   UPSTREAM ELEVATION(FEET) =   96.00  DOWNSTREAM ELEVATION(FEET) =   94.00
   STREET LENGTH(FEET) =   439.00   CURB HEIGHT(INCHES) =  8.0
   STREET HALFWIDTH(FEET) = 42.00

   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  21.00
   INSIDE STREET CROSSFALL(DECIMAL) =  0.020
   OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
   STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.11
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) =  0.41
     HALFSTREET FLOOD WIDTH(FEET) =   12.43
     AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.76
     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.72
   STREET FLOW TRAVEL TIME(MIN.) =   4.15   Tc(MIN.) =   15.48
   *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.125
   SUBAREA LOSS RATE DATA(AMC  II):
    DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
        LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
   RESIDENTIAL
   "5-7 DWELLINGS/ACRE"       C       1.10     0.25      0.500    69
   COMMERCIAL                 C       1.20     0.25      0.100    69
   SCHOOL                     C       1.00     0.25      0.600    69
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.385
   SUBAREA AREA(ACRES) =     3.30      SUBAREA RUNOFF(CFS) =     6.02
   EFFECTIVE AREA(ACRES) =       4.70    AREA-AVERAGED Fm(INCH/HR) =  0.09
   AREA-AVERAGED Fp(INCH/HR) = 0.25  AREA-AVERAGED Ap =  0.37
   TOTAL AREA(ACRES) =       4.7       PEAK FLOW RATE(CFS) =      8.59
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  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.45   HALFSTREET FLOOD WIDTH(FEET) =  14.36
  FLOW VELOCITY(FEET/SEC.) =  1.91   DEPTH*VELOCITY(FT*FT/SEC.) =   0.85
  LONGEST FLOWPATH FROM NODE    121.00 TO NODE    123.00 =    769.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    123.00 TO NODE    124.00 IS CODE =  62
-------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
=========================================================================
  UPSTREAM ELEVATION(FEET) =   94.00  DOWNSTREAM ELEVATION(FEET) =   90.00
  STREET LENGTH(FEET) =   870.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 42.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  21.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.28
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.50
    HALFSTREET FLOOD WIDTH(FEET) =   17.18
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.12
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.06
  STREET FLOW TRAVEL TIME(MIN.) =   6.86   Tc(MIN.) =   22.33
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.722
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE           GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       C       3.30      0.25      0.500     69
  COMMERCIAL                 C       2.00      0.25      0.100     69
  SCHOOL                     C       1.10      0.25      0.600     69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.392
  SUBAREA AREA(ACRES) =   6.40      SUBAREA RUNOFF(CFS) =    9.35
  EFFECTIVE AREA(ACRES) =    11.10    AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.38
  TOTAL AREA(ACRES) =       11.1        PEAK FLOW RATE(CFS) =      16.24

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.53   HALFSTREET FLOOD WIDTH(FEET) =  18.59
  FLOW VELOCITY(FEET/SEC.) =  2.23   DEPTH*VELOCITY(FT*FT/SEC.) =   1.18
  LONGEST FLOWPATH FROM NODE    121.00 TO NODE    124.00 =   1639.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    124.00 TO NODE    125.00 IS CODE =  62
-------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
=========================================================================
  UPSTREAM ELEVATION(FEET) =   90.00  DOWNSTREAM ELEVATION(FEET) =   85.00
  STREET LENGTH(FEET) =   967.00   CURB HEIGHT(INCHES) =  8.0
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   STREET HALFWIDTH(FEET) = 42.00

   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  21.00
   INSIDE STREET CROSSFALL(DECIMAL) =  0.020
   OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
   STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.40
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) =  0.59
     HALFSTREET FLOOD WIDTH(FEET) =   21.70
     AVERAGE FLOW VELOCITY(FEET/SEC.) =     2.59
     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.54
   STREET FLOW TRAVEL TIME(MIN.) =   6.21   Tc(MIN.) =   28.55
   *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.496
   SUBAREA LOSS RATE DATA(AMC  II):
    DEVELOPMENT TYPE/      SCS SOIL    AREA       Fp        Ap    SCS
        LAND USE           GROUP    (ACRES)  (INCH/HR) (DECIMAL)  CN
   RESIDENTIAL
   "5-7 DWELLINGS/ACRE"       C       8.50      0.25     0.500    69
   COMMERCIAL                 C       4.80      0.25     0.100    69
   SCHOOL                     C       1.20      0.25     0.600    69
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.376
   SUBAREA AREA(ACRES) =   14.50      SUBAREA RUNOFF(CFS) =   18.30
   EFFECTIVE AREA(ACRES) =    25.60    AREA-AVERAGED Fm(INCH/HR) =  0.09
   AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.38
   TOTAL AREA(ACRES) =      25.6        PEAK FLOW RATE(CFS) =     32.28

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 0.63   HALFSTREET FLOOD WIDTH(FEET) =  23.83
   FLOW VELOCITY(FEET/SEC.) =  2.75   DEPTH*VELOCITY(FT*FT/SEC.) =   1.75
   LONGEST FLOWPATH FROM NODE    121.00 TO NODE    125.00 =    2606.00 FEET.

 **************************************************************************
   FLOW PROCESS FROM NODE    125.00 TO NODE    126.00 IS CODE =  62
 --------------------------------------------------------------------------
   >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
 ==========================================================================
   UPSTREAM ELEVATION(FEET) =   85.00  DOWNSTREAM ELEVATION(FEET) =   82.00
   STREET LENGTH(FEET) =    452.00   CURB HEIGHT(INCHES) =  8.0
   STREET HALFWIDTH(FEET) = 42.00

   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  21.00
   INSIDE STREET CROSSFALL(DECIMAL) =  0.020
   OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
   STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      46.76
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) =  0.68
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   HALFSTREET FLOOD WIDTH(FEET) =    27.00
   AVERAGE FLOW VELOCITY(FEET/SEC.) =     3.31
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =     2.26
 STREET FLOW TRAVEL TIME(MIN.) =   2.28   Tc(MIN.) =    30.82
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.432
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/     SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP    (ACRES)  (INCH/HR) (DECIMAL)  CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"       C      11.70     0.25     0.500     69
 COMMERCIAL                 C      12.00     0.25     0.100     69
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.297
 SUBAREA AREA(ACRES) =   23.70      SUBAREA RUNOFF(CFS) =   28.95
 EFFECTIVE AREA(ACRES) =     49.30    AREA-AVERAGED Fm(INCH/HR) =  0.09
 AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.34
 TOTAL AREA(ACRES) =        49.3        PEAK FLOW RATE(CFS) =      59.75

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.73   HALFSTREET FLOOD WIDTH(FEET) =  32.08
 FLOW VELOCITY(FEET/SEC.) =  3.49   DEPTH*VELOCITY(FT*FT/SEC.) =   2.56
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  452.0 FT WITH ELEVATION-DROP =   3.0 FT, IS   58.1 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    126.00
 LONGEST FLOWPATH FROM NODE    121.00 TO NODE    126.00 =   3058.00 FEET.

 *****************************************************************************
  FLOW PROCESS FROM NODE    126.00 TO NODE    126.50 IS CODE =  31
 -----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
 =============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    82.00  DOWNSTREAM(FEET) =    80.00
  FLOW LENGTH(FEET) =   847.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  35.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.97
  ESTIMATED PIPE DIAMETER(INCH) =  48.00     NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       59.75
  PIPE TRAVEL TIME(MIN.) =   2.37    Tc(MIN.) =   33.19
  LONGEST FLOWPATH FROM NODE    121.00 TO NODE    126.50 =   3905.00 FEET.

 *****************************************************************************
  FLOW PROCESS FROM NODE    126.50 TO NODE    126.50 IS CODE =   1
 -----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 =============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   33.19
  RAINFALL INTENSITY(INCH/HR) =   1.37
  AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.25
  AREA-AVERAGED Ap =  0.34
  EFFECTIVE STREAM AREA(ACRES) =      49.30
  TOTAL STREAM AREA(ACRES) =      49.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      59.75

 *****************************************************************************
  FLOW PROCESS FROM NODE    126.10 TO NODE    126.20 IS CODE =  21
 -----------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =     85.00  DOWNSTREAM(FEET) =     84.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.862
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.751
  SUBAREA Tc 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"      C       0.80     0.25    0.500    69   12.62
  COMMERCIAL                C       0.30     0.25    0.100    69    9.86
  URBAN POOR COVER
  "TURF"                    C       0.70     0.25    1.000    83   17.03
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.628
  SUBAREA RUNOFF(CFS) =      4.20
  TOTAL AREA(ACRES) =      1.80   PEAK FLOW RATE(CFS) =      4.20

****************************************************************************
  FLOW PROCESS FROM NODE    126.20 TO NODE    126.30 IS CODE =  62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =   84.00  DOWNSTREAM ELEVATION(FEET) =   82.00
  STREET LENGTH(FEET) =   625.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      8.47
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.43
    HALFSTREET FLOOD WIDTH(FEET) =   15.51
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.66
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.71
  STREET FLOW TRAVEL TIME(MIN.) =   6.28   Tc(MIN.) =   16.14
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.074
  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"      C       1.10     0.25    0.500    69
  COMMERCIAL                A       1.20     0.40    0.100    32
  COMMERCIAL                C       0.60     0.25    0.100    69
  URBAN POOR COVER
  "TURF"                    B       1.20     0.30    1.000    74
  URBAN POOR COVER
  "TURF"                    C       0.80     0.25    1.000    83
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.28
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.557
  SUBAREA AREA(ACRES) =    4.90      SUBAREA RUNOFF(CFS) =     8.46
  EFFECTIVE AREA(ACRES) =      6.70    AREA-AVERAGED Fm(INCH/HR) =  0.16
  AREA-AVERAGED Fp(INCH/HR) =  0.27  AREA-AVERAGED Ap =  0.58
  TOTAL AREA(ACRES) =         6.7        PEAK FLOW RATE(CFS) =      11.57

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.47   HALFSTREET FLOOD WIDTH(FEET) =  17.62
  FLOW VELOCITY(FEET/SEC.) =  1.78   DEPTH*VELOCITY(FT*FT/SEC.) =   0.83
  LONGEST FLOWPATH FROM NODE    126.10 TO NODE    126.30 =    955.00 FEET.

  **************************************************************************
  FLOW PROCESS FROM NODE    126.30 TO NODE    126.40 IS CODE =  62
  -------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
  =========================================================================
  UPSTREAM ELEVATION(FEET) =   82.00  DOWNSTREAM ELEVATION(FEET) =   81.00
  STREET LENGTH(FEET) =   292.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.30
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.53
    HALFSTREET FLOOD WIDTH(FEET) =   21.45
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.07
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.09
  STREET FLOW TRAVEL TIME(MIN.) =   2.35   Tc(MIN.) =   18.49
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.919
  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"       C       3.80      0.25      0.500     69
  COMMERCIAL                 B       1.40      0.30      0.100     56
  COMMERCIAL                 C       2.90      0.25      0.100     69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.288
  SUBAREA AREA(ACRES) =    8.10      SUBAREA RUNOFF(CFS) =   13.46
  EFFECTIVE AREA(ACRES) =     14.80    AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.26  AREA-AVERAGED Ap =  0.42
  TOTAL AREA(ACRES) =        14.8        PEAK FLOW RATE(CFS) =      24.09

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.57   HALFSTREET FLOOD WIDTH(FEET) =  23.41
  FLOW VELOCITY(FEET/SEC.) =  2.27   DEPTH*VELOCITY(FT*FT/SEC.) =   1.29
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  292.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   20.4 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    126.40
```

GC10EX
LONGEST FLOWPATH FROM NODE   126.10 TO NODE   126.40 =   1247.00 FEET.

****
  FLOW PROCESS FROM NODE   126.40 TO NODE   126.50 IS CODE = 62

  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 1 USED)<<<<<
==
  UPSTREAM ELEVATION(FEET) =   81.00 DOWNSTREAM ELEVATION(FEET) =   80.00
  STREET LENGTH(FEET) =   449.00   CURB HEIGHT(INCHES) = 6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   34.17
    STREET FLOWING FULL
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) = 0.67
    HALFSTREET FLOOD WIDTH(FEET) =   28.35
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   2.17
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.45
  STREET FLOW TRAVEL TIME(MIN.) =   3.44   Tc(MIN.) =   21.94
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.740
  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"   C   4.10   0.25   0.500   69
  COMMERCIAL   B   1.60   0.30   0.100   56
  COMMERCIAL   C   7.60   0.25   0.100   69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.223
  SUBAREA AREA(ACRES) =   13.30   SUBAREA RUNOFF(CFS) =   20.15
  EFFECTIVE AREA(ACRES) =   28.10   AREA-AVERAGED Fm(INCH/HR) = 0.08
  AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.33
  TOTAL AREA(ACRES) =   28.1   PEAK FLOW RATE(CFS) =   41.85

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.71   HALFSTREET FLOOD WIDTH(FEET) = 30.49
  FLOW VELOCITY(FEET/SEC.) = 2.30   DEPTH*VELOCITY(FT*FT/SEC.) =   1.63
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L = 449.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   28.9 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   126.50
  LONGEST FLOWPATH FROM NODE   126.10 TO NODE   126.50 =   1696.00 FEET.

****
  FLOW PROCESS FROM NODE   126.50 TO NODE   126.50 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:
23

```
  TIME OF CONCENTRATION(MIN.) =   21.94
  RAINFALL INTENSITY(INCH/HR) =   1.74
  AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.26
  AREA-AVERAGED Ap =  0.33
  EFFECTIVE STREAM AREA(ACRES) =      28.10
  TOTAL STREAM AREA(ACRES) =      28.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       41.85

  ** CONFLUENCE DATA **
   STREAM      Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER    (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1      59.75   33.19   1.372   0.25( 0.09) 0.34     49.3     121.00
      2      41.85   21.94   1.740   0.26( 0.08) 0.33     28.1     126.10

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

  ** PEAK FLOW RATE TABLE **
   STREAM      Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER    (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1      92.62   21.94   1.740   0.25( 0.08) 0.33     60.7     126.10
      2      92.31   33.19   1.372   0.25( 0.08) 0.34     77.4     121.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      92.62    Tc(MIN.) =    21.94
  EFFECTIVE AREA(ACRES) =      60.68   AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.33
  TOTAL AREA(ACRES) =      77.4
  LONGEST FLOWPATH FROM NODE    121.00 TO NODE    126.50 =    3905.00 FEET.

*************************************************************************
  FLOW PROCESS FROM NODE    126.50 TO NODE    127.00 IS CODE =  31
-----------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=======================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    80.00  DOWNSTREAM(FEET) =    78.00
  FLOW LENGTH(FEET) =   889.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  57.0 INCH PIPE IS  42.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.53
  ESTIMATED PIPE DIAMETER(INCH) =  57.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       92.62
  PIPE TRAVEL TIME(MIN.) =   2.27    Tc(MIN.) =    24.20
  LONGEST FLOWPATH FROM NODE    121.00 TO NODE    127.00 =    4794.00 FEET.

*************************************************************************
  FLOW PROCESS FROM NODE    127.00 TO NODE    127.00 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      92.62   24.20   1.644   0.25( 0.08) 0.33     60.7     126.10
      2      92.31   35.46   1.321   0.25( 0.08) 0.34     77.4     121.00
  LONGEST FLOWPATH FROM NODE    121.00 TO NODE    127.00 =    4794.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
```

```
                                    GC10EX
   STREAM      Q      Tc    Intensity  Fp(Fm)     Ap      Ae    HEADWATER
   NUMBER    (CFS)  (MIN.) (INCH/HR) (INCH/HR)        (ACRES)    NODE
     1       329.03  31.17    1.423  0.29( 0.12) 0.41    250.8    116.00
     2       338.02  34.35    1.345  0.29( 0.12) 0.41    274.7    112.00
     3       337.88  35.15    1.328  0.29( 0.12) 0.41    278.8    104.00
     4       318.65  42.20    1.196  0.28( 0.12) 0.41    299.7    100.00
   LONGEST FLOWPATH FROM NODE     100.00 TO NODE    127.00 =    7705.00 FEET.

   ** PEAK FLOW RATE TABLE **
   STREAM      Q      Tc    Intensity  Fp(Fm)     Ap      Ae    HEADWATER
   NUMBER    (CFS)  (MIN.) (INCH/HR) (INCH/HR)        (ACRES)    NODE
     1       391.52  24.20    1.644  0.28( 0.11) 0.39    255.5    126.10
     2       421.46  31.17    1.423  0.28( 0.11) 0.39    321.9    116.00
     3       430.36  34.35    1.345  0.28( 0.11) 0.39    350.5    112.00
     4       430.20  35.15    1.328  0.28( 0.11) 0.39    355.7    104.00
     5       429.34  35.46    1.321  0.28( 0.11) 0.39    357.1    121.00
     6       401.61  42.20    1.196  0.28( 0.11) 0.39    377.1    100.00
      TOTAL AREA(ACRES) =       377.1

   COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
   PEAK FLOW RATE(CFS) =      430.36  Tc(MIN.) =   34.354
   EFFECTIVE AREA(ACRES) =    350.45  AREA-AVERAGED Fm(INCH/HR) =  0.11
   AREA-AVERAGED Fp(INCH/HR) =  0.28  AREA-AVERAGED Ap =  0.39
   TOTAL AREA(ACRES) =       377.1
   LONGEST FLOWPATH FROM NODE     100.00 TO NODE    127.00 =    7705.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    127.00 TO NODE    127.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    127.00 TO NODE    127.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   34.35
  RAINFALL INTENSITY(INCH/HR) =   1.35
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.28
  AREA-AVERAGED Ap =  0.39
  EFFECTIVE STREAM AREA(ACRES) =     350.45
  TOTAL STREAM AREA(ACRES) =     377.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     430.36

****************************************************************************
  FLOW PROCESS FROM NODE    126.60 TO NODE    126.70 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =     80.00  DOWNSTREAM(FEET) =     79.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.329
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.541
```

```
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL    AREA      Fp         Ap      SCS    Tc
        LAND USE          GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN   (MIN.)
  COMMERCIAL                 B        9.20     0.30      0.100     56   11.33
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     20.79
  TOTAL AREA(ACRES) =       9.20   PEAK FLOW RATE(CFS) =     20.79

**************************************************************************
  FLOW PROCESS FROM NODE    126.70 TO NODE    126.80 IS CODE =  62
--------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
==========================================================================
  UPSTREAM ELEVATION(FEET) =   79.50  DOWNSTREAM ELEVATION(FEET) =   79.00
  STREET LENGTH(FEET) =   350.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 42.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  21.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      30.83
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.76
    HALFSTREET FLOOD WIDTH(FEET) =   34.54
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.64
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.24
  STREET FLOW TRAVEL TIME(MIN.) =   3.55   Tc(MIN.) =   14.88
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.173
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL    AREA      Fp         Ap      SCS
        LAND USE          GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B       10.40     0.30      0.100     56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =   10.40      SUBAREA RUNOFF(CFS) =   20.06
  EFFECTIVE AREA(ACRES) =     19.60    AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        19.6        PEAK FLOW RATE(CFS) =      37.80

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.80   HALFSTREET FLOOD WIDTH(FEET) =  39.14
  FLOW VELOCITY(FEET/SEC.) =  1.71   DEPTH*VELOCITY(FT*FT/SEC.) =   1.37
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  350.0 FT WITH ELEVATION-DROP =   0.5 FT, IS   23.0 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    126.80
  LONGEST FLOWPATH FROM NODE    126.60 TO NODE    126.80 =    680.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    126.80 TO NODE    127.00 IS CODE =  62
--------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
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================================================================================
  UPSTREAM ELEVATION(FEET) =   79.00  DOWNSTREAM ELEVATION(FEET) =    78.00
  STREET LENGTH(FEET) =   461.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 42.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  21.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      62.38
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.88
    HALFSTREET FLOOD WIDTH(FEET) =   46.36
    AVERAGE FLOW VELOCITY(FEET/SEC.) =     2.20
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.93
  STREET FLOW TRAVEL TIME(MIN.) =   3.49   Tc(MIN.) =   18.37
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.926
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA       Fp         Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR) (DECIMAL)  CN
  COMMERCIAL                B       26.90      0.30      0.100    56
  URBAN POOR COVER
  "TURF"                    B        2.20      0.30      1.000    74
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.168
  SUBAREA AREA(ACRES) =   29.10      SUBAREA RUNOFF(CFS) =   49.12
  EFFECTIVE AREA(ACRES) =     48.70    AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.14
  TOTAL AREA(ACRES) =       48.7       PEAK FLOW RATE(CFS) =      82.56

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.95   HALFSTREET FLOOD WIDTH(FEET) =  53.74
  FLOW VELOCITY(FEET/SEC.) =  2.31   DEPTH*VELOCITY(FT*FT/SEC.) =   2.20
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  461.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   62.9 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    127.00
  LONGEST FLOWPATH FROM NODE    126.60 TO NODE    127.00 =   1141.00 FEET.

  ***************************************************************************
  FLOW PROCESS FROM NODE    127.00 TO NODE    127.00 IS CODE =    1
  -------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
  =========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   18.37
  RAINFALL INTENSITY(INCH/HR) =   1.93
  AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.14
  EFFECTIVE STREAM AREA(ACRES) =      48.70
  TOTAL STREAM AREA(ACRES) =      48.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      82.56
```

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	391.52	24.20	1.644	0.28(0.11)	0.39	255.5	126.10
1	421.46	31.17	1.423	0.28(0.11)	0.39	321.9	116.00
1	430.36	34.35	1.345	0.28(0.11)	0.39	350.5	112.00
1	430.20	35.15	1.328	0.28(0.11)	0.39	355.7	104.00
1	429.34	35.46	1.321	0.28(0.11)	0.39	357.1	121.00
1	401.61	42.20	1.196	0.28(0.11)	0.39	377.1	100.00
2	82.56	18.37	1.926	0.30(0.04)	0.14	48.7	126.60

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	434.19	18.37	1.926	0.28(0.10)	0.34	242.6	126.60
2	461.74	24.20	1.644	0.28(0.10)	0.35	304.2	126.10
3	481.96	31.17	1.423	0.28(0.10)	0.36	370.6	116.00
4	487.49	34.35	1.345	0.28(0.10)	0.36	399.2	112.00
5	486.55	35.15	1.328	0.28(0.10)	0.36	404.4	104.00
6	485.40	35.46	1.321	0.28(0.10)	0.36	405.8	121.00
7	452.18	42.20	1.196	0.28(0.10)	0.36	425.8	100.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =   487.49   Tc(MIN.) =   34.35
EFFECTIVE AREA(ACRES) =   399.15   AREA-AVERAGED Fm(INCH/HR) = 0.10
AREA-AVERAGED Fp(INCH/HR) = 0.28 AREA-AVERAGED Ap = 0.36
TOTAL AREA(ACRES) =   425.8
LONGEST FLOWPATH FROM NODE   100.00 TO NODE   127.00 =   7705.00 FEET.

****
  FLOW PROCESS FROM NODE   128.00 TO NODE   129.00 IS CODE = 21

  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =   78.50 DOWNSTREAM(FEET) =   78.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.329
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.541
  SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
APARTMENTS	B	7.90	0.30	0.200	56	12.07
COMMERCIAL	B	0.20	0.30	0.100	56	11.33
URBAN POOR COVER "TURF"	B	0.10	0.30	1.000	74	19.56

  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.207
  SUBAREA RUNOFF(CFS) =   18.29
  TOTAL AREA(ACRES) =   8.20   PEAK FLOW RATE(CFS) =   18.29

****
  FLOW PROCESS FROM NODE   129.00 TO NODE   130.00 IS CODE = 62

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

  >>>>>(STREET TABLE SECTION # 1 USED)<<<<<
==
  UPSTREAM ELEVATION(FEET) =   78.00 DOWNSTREAM ELEVATION(FEET) =   75.00
  STREET LENGTH(FEET) =   525.00 CURB HEIGHT(INCHES) = 6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   29.08
    STREET FLOWING FULL
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) = 0.56
    HALFSTREET FLOOD WIDTH(FEET) =   22.92
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   2.86
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.60
  STREET FLOW TRAVEL TIME(MIN.) =   3.05   Tc(MIN.) =   14.38
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.216
  SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
APARTMENTS	B	10.80	0.30	0.200	56
COMMERCIAL	B	0.20	0.30	0.100	56
URBAN POOR COVER					
"TURF"	B	0.10	0.30	1.000	74

  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.205
  SUBAREA AREA(ACRES) =   11.10   SUBAREA RUNOFF(CFS) =   21.52
  EFFECTIVE AREA(ACRES) =   19.30   AREA-AVERAGED Fm(INCH/HR) = 0.06
  AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.21
  TOTAL AREA(ACRES) =   19.3   PEAK FLOW RATE(CFS) =   37.41

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.60   HALFSTREET FLOOD WIDTH(FEET) = 24.87
  FLOW VELOCITY(FEET/SEC.) = 3.11   DEPTH*VELOCITY(FT*FT/SEC.) =   1.86
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 525.0 FT WITH ELEVATION-DROP =   3.0 FT, IS   26.0 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   130.00
  LONGEST FLOWPATH FROM NODE   128.00 TO NODE   130.00 =   855.00 FEET.

****
  FLOW PROCESS FROM NODE   130.00 TO NODE   130.50 IS CODE = 62

  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 1 USED)<<<<<
==
  UPSTREAM ELEVATION(FEET) =   75.00 DOWNSTREAM ELEVATION(FEET) =   74.00
  STREET LENGTH(FEET) =   837.00 CURB HEIGHT(INCHES) = 6.0
  STREET HALFWIDTH(FEET) = 20.00

  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) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      47.12
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.82
    HALFSTREET FLOOD WIDTH(FEET) =   35.80
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.86
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.52
  STREET FLOW TRAVEL TIME(MIN.) =   7.48   Tc(MIN.) =   21.87
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.743
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp        Ap     SCS
       LAND USE           GROUP    (ACRES)  (INCH/HR) (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B      0.10      0.30     0.500    56
  APARTMENTS                 B     12.40      0.30     0.200    56
  COMMERCIAL                 B      0.10      0.30     0.100    56
  URBAN POOR COVER
  "TURF"                     B      0.10      0.30     1.000    74
  SCHOOL                     B      0.10      0.30     0.600    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.211
  SUBAREA AREA(ACRES) =   12.80      SUBAREA RUNOFF(CFS) =   19.35
  EFFECTIVE AREA(ACRES) =     32.10    AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.21
  TOTAL AREA(ACRES) =       32.1        PEAK FLOW RATE(CFS) =      48.55

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.82   HALFSTREET FLOOD WIDTH(FEET) =  36.22
  FLOW VELOCITY(FEET/SEC.) =  1.88   DEPTH*VELOCITY(FT*FT/SEC.) =   1.55
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  837.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   22.3 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    130.50
  LONGEST FLOWPATH FROM NODE    128.00 TO NODE    130.50 =   1692.00 FEET.

  **************************************************************************
  FLOW PROCESS FROM NODE    130.50 TO NODE    131.00 IS CODE =  31
  ---------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
  =======================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    74.00  DOWNSTREAM(FEET) =    73.50
  FLOW LENGTH(FEET) =   188.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  33.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.83
  ESTIMATED PIPE DIAMETER(INCH) = 42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       48.55
  PIPE TRAVEL TIME(MIN.) =   0.54    Tc(MIN.) =   22.40
  LONGEST FLOWPATH FROM NODE    128.00 TO NODE    131.00 =   1880.00 FEET.

  **************************************************************************
  FLOW PROCESS FROM NODE    132.00 TO NODE    133.00 IS CODE =  21
  ---------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
  =======================================================================
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    330.00
  ELEVATION DATA: UPSTREAM(FEET) =     88.00  DOWNSTREAM(FEET) =     87.00


  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.862
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.751
  SUBAREA Tc 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"       C        0.80      0.25      0.500     69    12.62
  COMMERCIAL                 C        0.90      0.25      0.100     69     9.86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.288
  SUBAREA RUNOFF(CFS) =      4.10
  TOTAL AREA(ACRES) =      1.70   PEAK FLOW RATE(CFS) =      4.10


****************************************************************************
  FLOW PROCESS FROM NODE    133.00 TO NODE    134.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =   87.00  DOWNSTREAM ELEVATION(FEET) =    84.00
  STREET LENGTH(FEET) =   733.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.77
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.43
    HALFSTREET FLOOD WIDTH(FEET) =   15.66
    AVERAGE FLOW VELOCITY(FEET/SEC.) =     1.88
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =     0.81
  STREET FLOW TRAVEL TIME(MIN.) =   6.51   Tc(MIN.) =    16.37
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.058
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL    AREA       Fp         Ap      SCS
       LAND USE           GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       C        3.30      0.25      0.500     69
  COMMERCIAL                 C        3.00      0.25      0.100     69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.310
  SUBAREA AREA(ACRES) =    6.30       SUBAREA RUNOFF(CFS) =   11.23
  EFFECTIVE AREA(ACRES) =      8.00    AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.30
  TOTAL AREA(ACRES) =       8.0        PEAK FLOW RATE(CFS) =      14.27

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.48   HALFSTREET FLOOD WIDTH(FEET) = 18.24
  FLOW VELOCITY(FEET/SEC.) = 2.05   DEPTH*VELOCITY(FT*FT/SEC.) =   0.99
```

LONGEST FLOWPATH FROM NODE   132.00 TO NODE   134.00 =   1063.00 FEET.

****
  FLOW PROCESS FROM NODE   134.00 TO NODE   135.00 IS CODE = 62

  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 1 USED)<<<<<
==
  UPSTREAM ELEVATION(FEET) =   84.00 DOWNSTREAM ELEVATION(FEET) =   83.50
  STREET LENGTH(FEET) =   385.00   CURB HEIGHT(INCHES) = 6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   27.84
    STREET FLOWING FULL
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) = 0.68
    HALFSTREET FLOOD WIDTH(FEET) =   29.02
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   1.69
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.15
  STREET FLOW TRAVEL TIME(MIN.) =   3.80   Tc(MIN.) =   20.17
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.826
  SUBAREA LOSS RATE DATA(AMC II):
   DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
       LAND USE   GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"   C   8.60   0.25   0.500   69
  COMMERCIAL   C   8.60   0.25   0.100   69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.300
  SUBAREA AREA(ACRES) =   17.20   SUBAREA RUNOFF(CFS) =   27.10
  EFFECTIVE AREA(ACRES) =   25.20   AREA-AVERAGED Fm(INCH/HR) = 0.08
  AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.30
  TOTAL AREA(ACRES) =   25.2   PEAK FLOW RATE(CFS) =   39.69

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.76   HALFSTREET FLOOD WIDTH(FEET) = 33.05
  FLOW VELOCITY(FEET/SEC.) = 1.85   DEPTH*VELOCITY(FT*FT/SEC.) =   1.41
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L = 385.0 FT WITH ELEVATION-DROP =   0.5 FT, IS   36.1 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   135.00
  LONGEST FLOWPATH FROM NODE   132.00 TO NODE   135.00 =   1448.00 FEET.

****
  FLOW PROCESS FROM NODE   135.00 TO NODE   136.00 IS CODE = 31

  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==
  ELEVATION DATA: UPSTREAM(FEET) =   83.50 DOWNSTREAM(FEET) =   82.00
  FLOW LENGTH(FEET) = 1072.00   MANNING'S N = 0.013
  DEPTH OF FLOW IN 45.0 INCH PIPE IS 34.2 INCHES

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.41
  ESTIMATED PIPE DIAMETER(INCH) = 45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       39.69
  PIPE TRAVEL TIME(MIN.) =   4.05    Tc(MIN.) =   24.22
  LONGEST FLOWPATH FROM NODE    132.00 TO NODE    136.00 =   2520.00 FEET.


**************************************************************************
  FLOW PROCESS FROM NODE    136.00 TO NODE    136.00 IS CODE =  81
--------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  MAINLINE Tc(MIN.) =   24.22
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.644
  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"       C      15.20     0.25      0.500    69
  COMMERCIAL                 C      13.20     0.25      0.100    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.314
  SUBAREA AREA(ACRES) =   28.40      SUBAREA RUNOFF(CFS) =   40.01
  EFFECTIVE AREA(ACRES) =     53.60   AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.31
  TOTAL AREA(ACRES) =        53.6      PEAK FLOW RATE(CFS) =      75.58


**************************************************************************
  FLOW PROCESS FROM NODE    136.00 TO NODE    137.00 IS CODE =  31
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    82.00  DOWNSTREAM(FEET) =    76.00
  FLOW LENGTH(FEET) = 1011.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  32.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.99
  ESTIMATED PIPE DIAMETER(INCH) = 45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       75.58
  PIPE TRAVEL TIME(MIN.) =   1.87    Tc(MIN.) =   26.09
  LONGEST FLOWPATH FROM NODE    132.00 TO NODE    137.00 =   3531.00 FEET.


**************************************************************************
  FLOW PROCESS FROM NODE    137.00 TO NODE    137.00 IS CODE =  81
--------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  MAINLINE Tc(MIN.) =   26.09
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.575
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL    AREA      Fp        Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       C      16.20     0.25      0.500    69
  COMMERCIAL                 C      14.10     0.25      0.100    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.314
  SUBAREA AREA(ACRES) =   30.30      SUBAREA RUNOFF(CFS) =   40.81
  EFFECTIVE AREA(ACRES) =     83.90   AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.31
  TOTAL AREA(ACRES) =        83.9      PEAK FLOW RATE(CFS) =     113.08
```

```
**************************************************************************
  FLOW PROCESS FROM NODE    137.00 TO NODE    141.00 IS CODE =  31
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    76.00  DOWNSTREAM(FEET) =    74.00
  FLOW LENGTH(FEET) = 1012.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  63.0 INCH PIPE IS  46.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.54
  ESTIMATED PIPE DIAMETER(INCH) = 63.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     113.08
  PIPE TRAVEL TIME(MIN.) =   2.58    Tc(MIN.) =   28.67
  LONGEST FLOWPATH FROM NODE    132.00 TO NODE    141.00 =    4543.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    141.00 TO NODE    141.00 IS CODE =   1
--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   28.67
  RAINFALL INTENSITY(INCH/HR) =   1.49
  AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.25
  AREA-AVERAGED Ap =  0.31
  EFFECTIVE STREAM AREA(ACRES) =      83.90
  TOTAL STREAM AREA(ACRES) =      83.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     113.08

**************************************************************************
  FLOW PROCESS FROM NODE    138.00 TO NODE    139.00 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =     76.00  DOWNSTREAM(FEET) =     75.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.329
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =   2.541
  SUBAREA Tc 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       2.10      0.30      0.100     56   11.33
  COMMERCIAL                  C       3.20      0.25      0.100     69   11.33
  URBAN POOR COVER
  "TURF"                      B       0.10      0.30      1.000     74   19.56
  SCHOOL                      B       3.20      0.30      0.600     56   15.35
  SCHOOL                      C       0.70      0.25      0.600     69   15.35
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.319
  SUBAREA RUNOFF(CFS) =     20.50
  TOTAL AREA(ACRES) =      9.30   PEAK FLOW RATE(CFS) =      20.50

**************************************************************************
  FLOW PROCESS FROM NODE    139.00 TO NODE    140.00 IS CODE =  62
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =   75.50  DOWNSTREAM ELEVATION(FEET) =   75.00
  STREET LENGTH(FEET) =   560.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       33.61
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.77
    HALFSTREET FLOOD WIDTH(FEET) =   33.29
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.54
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.18
  STREET FLOW TRAVEL TIME(MIN.) =   6.06   Tc(MIN.) =   17.39
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.988
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL    AREA       Fp         Ap     SCS
       LAND USE            GROUP    (ACRES)  (INCH/HR)  (DECIMAL)   CN
  COMMERCIAL                 B       4.20       0.30      0.100     56
  URBAN POOR COVER
  "TURF"                     B       0.30       0.30      1.000     74
  SCHOOL                     B       5.00       0.30      0.600     56
  SCHOOL                     C       6.10       0.25      0.600     69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.28
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.473
  SUBAREA AREA(ACRES) =   15.60       SUBAREA RUNOFF(CFS) =   26.08
  EFFECTIVE AREA(ACRES) =    24.90    AREA-AVERAGED Fm(INCH/HR) =  0.12
  AREA-AVERAGED Fp(INCH/HR) =  0.28  AREA-AVERAGED Ap =  0.42
  TOTAL AREA(ACRES) =       24.9       PEAK FLOW RATE(CFS) =      41.95

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.82   HALFSTREET FLOOD WIDTH(FEET) =  36.16
  FLOW VELOCITY(FEET/SEC.) =  1.63   DEPTH*VELOCITY(FT*FT/SEC.) =   1.34
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  560.0 FT WITH ELEVATION-DROP =   0.5 FT, IS   27.9 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    140.00
  LONGEST FLOWPATH FROM NODE    138.00 TO NODE    140.00 =     890.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    140.00 TO NODE    141.00 IS CODE =   31
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     75.00  DOWNSTREAM(FEET) =     74.00
  FLOW LENGTH(FEET) =   391.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  30.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  5.65
  ESTIMATED PIPE DIAMETER(INCH) = 42.00    NUMBER OF PIPES =   1
```

```
   PIPE-FLOW(CFS) =       41.95
   PIPE TRAVEL TIME(MIN.) =   1.15    Tc(MIN.) =   18.54
   LONGEST FLOWPATH FROM NODE    138.00 TO NODE    141.00 =    1281.00 FEET.


****************************************************************************
   FLOW PROCESS FROM NODE    141.00 TO NODE    141.00 IS CODE =   81
-------------------------------------------------------------------------------
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===============================================================================
   MAINLINE Tc(MIN.) =   18.54
   *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.916
   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       1.30     0.30     0.500    56
   RESIDENTIAL
   "5-7 DWELLINGS/ACRE"       C       2.00     0.25     0.500    69
   COMMERCIAL                 B       3.60     0.30     0.100    56
   COMMERCIAL                 C       4.80     0.25     0.100    69
   URBAN POOR COVER
   "TURF"                     B       0.20     0.30     1.000    74
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.226
   SUBAREA AREA(ACRES) =   11.90     SUBAREA RUNOFF(CFS) =   19.86
   EFFECTIVE AREA(ACRES) =    36.80   AREA-AVERAGED Fm(INCH/HR) =  0.10
   AREA-AVERAGED Fp(INCH/HR) =  0.28  AREA-AVERAGED Ap =  0.35
   TOTAL AREA(ACRES) =      36.8      PEAK FLOW RATE(CFS) =     60.20


****************************************************************************
   FLOW PROCESS FROM NODE    141.00 TO NODE    141.00 IS CODE =    1
-------------------------------------------------------------------------------
   >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
   >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
===============================================================================
   TOTAL NUMBER OF STREAMS =  2
   CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
   TIME OF CONCENTRATION(MIN.) =   18.54
   RAINFALL INTENSITY(INCH/HR) =   1.92
   AREA-AVERAGED Fm(INCH/HR) =  0.10
   AREA-AVERAGED Fp(INCH/HR) =  0.28
   AREA-AVERAGED Ap =  0.35
   EFFECTIVE STREAM AREA(ACRES) =     36.80
   TOTAL STREAM AREA(ACRES) =     36.80
   PEAK FLOW RATE(CFS) AT CONFLUENCE =     60.20

   ** CONFLUENCE DATA **
    STREAM     Q      Tc   Intensity  Fp(Fm)     Ap      Ae    HEADWATER
    NUMBER   (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)   NODE
      1     113.08  28.67    1.492  0.25( 0.08) 0.31     83.9    132.00
      2      60.20  18.54    1.916  0.28( 0.10) 0.35     36.8    138.00

   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     155.20  18.54    1.916  0.26( 0.09) 0.33     91.1    138.00
      2     159.25  28.67    1.492  0.26( 0.08) 0.32    120.7    132.00
```

```
   COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
   PEAK FLOW RATE(CFS) =      159.25    Tc(MIN.) =     28.67
   EFFECTIVE AREA(ACRES) =      120.70   AREA-AVERAGED Fm(INCH/HR) =  0.08
   AREA-AVERAGED Fp(INCH/HR) =  0.26  AREA-AVERAGED Ap =  0.32
   TOTAL AREA(ACRES) =       120.7
   LONGEST FLOWPATH FROM NODE    132.00 TO NODE    141.00 =    4543.00 FEET.

****************************************************************************
   FLOW PROCESS FROM NODE    142.00 TO NODE    143.00 IS CODE =  21
--------------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
   >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
   INITIAL SUBAREA FLOW-LENGTH(FEET) =    330.00
   ELEVATION DATA: UPSTREAM(FEET) =      78.00  DOWNSTREAM(FEET) =      77.50

   Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
   SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    11.329
   *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.541
   SUBAREA Tc AND LOSS RATE DATA(AMC  II):
    DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS    Tc
        LAND USE           GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN   (MIN.)
   APARTMENTS               B        0.30      0.30       0.200    56    12.07
   COMMERCIAL               B        0.40      0.30       0.100    56    11.33
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.143
   SUBAREA RUNOFF(CFS) =       1.57
   TOTAL AREA(ACRES) =       0.70   PEAK FLOW RATE(CFS) =       1.57

****************************************************************************
   FLOW PROCESS FROM NODE    143.00 TO NODE    144.00 IS CODE =  62
--------------------------------------------------------------------------------
   >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
   UPSTREAM ELEVATION(FEET) =   77.50  DOWNSTREAM ELEVATION(FEET) =    77.00
   STREET LENGTH(FEET) =    307.00   CURB HEIGHT(INCHES) =  6.0
   STREET HALFWIDTH(FEET) = 20.00

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

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
   STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.93
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) =  0.35
     HALFSTREET FLOOD WIDTH(FEET) =    11.52
     AVERAGE FLOW VELOCITY(FEET/SEC.) =     0.99
     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =     0.34
   STREET FLOW TRAVEL TIME(MIN.) =    5.16   Tc(MIN.) =    16.49
   *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.049
   SUBAREA LOSS RATE DATA(AMC  II):
    DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
        LAND USE           GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
```

```
  APARTMENTS                     B        1.20      0.30      0.200      56
  COMMERCIAL                     B        0.30      0.30      0.100      56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.180
  SUBAREA AREA(ACRES) =    1.50      SUBAREA RUNOFF(CFS) =    2.69
  EFFECTIVE AREA(ACRES) =     2.20    AREA-AVERAGED Fm(INCH/HR) =  0.05
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.17
  TOTAL AREA(ACRES) =        2.2        PEAK FLOW RATE(CFS) =       3.96

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.38   HALFSTREET FLOOD WIDTH(FEET) = 13.09
  FLOW VELOCITY(FEET/SEC.) = 1.06   DEPTH*VELOCITY(FT*FT/SEC.) =   0.40
  LONGEST FLOWPATH FROM NODE    142.00 TO NODE    144.00 =    637.00 FEET.

*************************************************************************
  FLOW PROCESS FROM NODE    144.00 TO NODE    145.00 IS CODE =  62
-------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
===============================================================================
  UPSTREAM ELEVATION(FEET) =   77.00  DOWNSTREAM ELEVATION(FEET) =    76.00
  STREET LENGTH(FEET) =    632.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.76
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.44
    HALFSTREET FLOOD WIDTH(FEET) =   16.37
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.20
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.53
  STREET FLOW TRAVEL TIME(MIN.) =   8.80   Tc(MIN.) =    25.29
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.603
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/     SCS SOIL    AREA       Fp          Ap      SCS
      LAND USE           GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
  APARTMENTS                 B        3.30      0.30      0.200      56
  COMMERCIAL                 B        0.70      0.30      0.100      56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.183
  SUBAREA AREA(ACRES) =    4.00      SUBAREA RUNOFF(CFS) =    5.58
  EFFECTIVE AREA(ACRES) =     6.20    AREA-AVERAGED Fm(INCH/HR) =  0.05
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.18
  TOTAL AREA(ACRES) =        6.2        PEAK FLOW RATE(CFS) =       8.65

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.48   HALFSTREET FLOOD WIDTH(FEET) = 18.01
  FLOW VELOCITY(FEET/SEC.) = 1.28   DEPTH*VELOCITY(FT*FT/SEC.) =   0.61
  LONGEST FLOWPATH FROM NODE    142.00 TO NODE    145.00 =   1269.00 FEET.

*************************************************************************
  FLOW PROCESS FROM NODE    145.00 TO NODE    146.00 IS CODE =  62
```

```
  --------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
  ============================================================================
  UPSTREAM ELEVATION(FEET) =   76.00  DOWNSTREAM ELEVATION(FEET) =    72.00
  STREET LENGTH(FEET) = 1273.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      15.90
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.52
    HALFSTREET FLOOD WIDTH(FEET) =   20.84
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.91
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.99
  STREET FLOW TRAVEL TIME(MIN.) =  11.12   Tc(MIN.) =   36.41
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.301
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL    AREA      Fp        Ap     SCS
       LAND USE            GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B       2.50     0.30      0.500     56
  COMMERCIAL                 B       2.70     0.30      0.100     56
  SCHOOL                     B       8.60     0.30      0.600     56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.484
  SUBAREA AREA(ACRES) =   13.80       SUBAREA RUNOFF(CFS) =   14.36
  EFFECTIVE AREA(ACRES) =    20.00    AREA-AVERAGED Fm(INCH/HR) =  0.12
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.39
  TOTAL AREA(ACRES) =      20.0        PEAK FLOW RATE(CFS) =      21.32

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.56   HALFSTREET FLOOD WIDTH(FEET) =  22.80
  FLOW VELOCITY(FEET/SEC.) =  2.12   DEPTH*VELOCITY(FT*FT/SEC.) =   1.18
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L = 1273.0 FT WITH ELEVATION-DROP =   4.0 FT, IS   23.4 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    146.00
  LONGEST FLOWPATH FROM NODE    142.00 TO NODE    146.00 =    2542.00 FEET.

  **************************************************************************
  FLOW PROCESS FROM NODE    146.00 TO NODE    146.50 IS CODE =  62
  --------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
  ============================================================================
  UPSTREAM ELEVATION(FEET) =   72.00  DOWNSTREAM ELEVATION(FEET) =    71.00
  STREET LENGTH(FEET) =  594.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 42.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  21.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
```

```
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020


  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     30.68
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.74
    HALFSTREET FLOOD WIDTH(FEET) =   32.58
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.76
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.30
  STREET FLOW TRAVEL TIME(MIN.) =   5.63   Tc(MIN.) =   42.05
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.198
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/     SCS SOIL   AREA      Fp        Ap     SCS
       LAND USE          GROUP   (ACRES)  (INCH/HR) (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B      10.50     0.30     0.500    56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       C       2.10     0.25     0.500    69
  COMMERCIAL                 B       5.30     0.30     0.100    56
  COMMERCIAL                 C       0.60     0.25     0.100    69
  URBAN POOR COVER
  "TURF"                     B       0.70     0.30     1.000    74
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.395
  SUBAREA AREA(ACRES) =   19.20      SUBAREA RUNOFF(CFS) =   18.71
  EFFECTIVE AREA(ACRES) =     39.20    AREA-AVERAGED Fm(INCH/HR) =  0.12
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.39
  TOTAL AREA(ACRES) =       39.2       PEAK FLOW RATE(CFS) =      38.18


  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.79   HALFSTREET FLOOD WIDTH(FEET) =  37.50
  FLOW VELOCITY(FEET/SEC.) =  1.83   DEPTH*VELOCITY(FT*FT/SEC.) =   1.44
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  594.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   36.8 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    146.50
  LONGEST FLOWPATH FROM NODE    142.00 TO NODE    146.50 =   3136.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   146.50 TO NODE    147.00 IS CODE =  31
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    71.00  DOWNSTREAM(FEET) =    70.00
  FLOW LENGTH(FEET) =    74.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  21.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.33
  ESTIMATED PIPE DIAMETER(INCH) = 30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       38.18
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =   42.17
  LONGEST FLOWPATH FROM NODE    142.00 TO NODE    147.00 =   3210.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   148.00 TO NODE    149.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =     74.00  DOWNSTREAM(FEET) =     72.00


  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.586
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.978
  SUBAREA Tc 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      1.30     0.30      0.500     56   10.99
  COMMERCIAL                 B      0.60     0.30      0.100     56    8.59
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.374
  SUBAREA RUNOFF(CFS) =      4.90
  TOTAL AREA(ACRES) =      1.90   PEAK FLOW RATE(CFS) =      4.90

****************************************************************************
  FLOW PROCESS FROM NODE    149.00 TO NODE    150.00 IS CODE =  62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =   72.00  DOWNSTREAM ELEVATION(FEET) =    70.00
  STREET LENGTH(FEET) =    341.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.30
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.40
    HALFSTREET FLOOD WIDTH(FEET) =   14.26
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.13
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.86
  STREET FLOW TRAVEL TIME(MIN.) =   2.67   Tc(MIN.) =   11.25
  *  10 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
  "5-7 DWELLINGS/ACRE"       B      2.80     0.30      0.500     56
  COMMERCIAL                 B      1.20     0.30      0.100     56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.380
  SUBAREA AREA(ACRES) =    4.00      SUBAREA RUNOFF(CFS) =    8.77
  EFFECTIVE AREA(ACRES) =      5.90    AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.38
  TOTAL AREA(ACRES) =      5.9        PEAK FLOW RATE(CFS) =     12.94

  END OF SUBAREA STREET FLOW HYDRAULICS:
```

DEPTH(FEET) = 0.44   HALFSTREET FLOOD WIDTH(FEET) = 16.29
FLOW VELOCITY(FEET/SEC.) = 2.31   DEPTH*VELOCITY(FT*FT/SEC.) =   1.02
LONGEST FLOWPATH FROM NODE   148.00 TO NODE   150.00 =   671.00 FEET.

****
FLOW PROCESS FROM NODE   150.00 TO NODE   151.00 IS CODE = 62

>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STREET TABLE SECTION # 1 USED)<<<<<
===
UPSTREAM ELEVATION(FEET) =   70.00 DOWNSTREAM ELEVATION(FEET) =   69.50
STREET LENGTH(FEET) =   383.00   CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

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

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   17.72
  STREET FLOWING FULL
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) = 0.60
  HALFSTREET FLOOD WIDTH(FEET) =   24.81
  AVERAGE FLOW VELOCITY(FEET/SEC.) =   1.48
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   0.88
STREET FLOW TRAVEL TIME(MIN.) =   4.31   Tc(MIN.) =   15.56
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.118
SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
     LAND USE   GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"5-7 DWELLINGS/ACRE"   B   4.00   0.30   0.500   56
COMMERCIAL   B   1.30   0.30   0.100   56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.402
SUBAREA AREA(ACRES) =   5.30   SUBAREA RUNOFF(CFS) =   9.53
EFFECTIVE AREA(ACRES) =   11.20   AREA-AVERAGED Fm(INCH/HR) = 0.12
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.39
TOTAL AREA(ACRES) =   11.2   PEAK FLOW RATE(CFS) =   20.18

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.62   HALFSTREET FLOOD WIDTH(FEET) = 25.91
FLOW VELOCITY(FEET/SEC.) = 1.54   DEPTH*VELOCITY(FT*FT/SEC.) =   0.95
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 383.0 FT WITH ELEVATION-DROP =   0.5 FT, IS   10.9 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   151.00
LONGEST FLOWPATH FROM NODE   148.00 TO NODE   151.00 =   1054.00 FEET.

****
FLOW PROCESS FROM NODE   151.00 TO NODE   151.50 IS CODE = 62

>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STREET TABLE SECTION # 1 USED)<<<<<
===
UPSTREAM ELEVATION(FEET) =   69.50 DOWNSTREAM ELEVATION(FEET) =   69.00

```
   STREET LENGTH(FEET) =   502.00   CURB HEIGHT(INCHES) =  6.0
   STREET HALFWIDTH(FEET) = 20.00

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

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
   STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.68
     ***STREET FLOWING FULL***
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) =  0.69
     HALFSTREET FLOOD WIDTH(FEET) =   29.57
     AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.50
     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.04
   STREET FLOW TRAVEL TIME(MIN.) =   5.58   Tc(MIN.) =   21.14
   *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.777
   SUBAREA LOSS RATE DATA(AMC  II):
    DEVELOPMENT TYPE/      SCS SOIL    AREA      Fp          Ap     SCS
        LAND USE          GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
   RESIDENTIAL
   "5-7 DWELLINGS/ACRE"        B       5.30     0.30      0.500     56
   COMMERCIAL                  B       1.80     0.30      0.100     56
   URBAN POOR COVER
   "TURF"                      B       0.30     0.30      1.000     74
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.423
   SUBAREA AREA(ACRES) =    7.40      SUBAREA RUNOFF(CFS) =   10.99
   EFFECTIVE AREA(ACRES) =     18.60    AREA-AVERAGED Fm(INCH/HR) =  0.12
   AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.40
   TOTAL AREA(ACRES) =       18.6         PEAK FLOW RATE(CFS) =      27.72

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 0.71   HALFSTREET FLOOD WIDTH(FEET) = 30.43
   FLOW VELOCITY(FEET/SEC.) = 1.53   DEPTH*VELOCITY(FT*FT/SEC.) =   1.08
   *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
          AND L =  502.0 FT WITH ELEVATION-DROP =   0.5 FT, IS   13.8 CFS,
          WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE     151.50
   LONGEST FLOWPATH FROM NODE    148.00 TO NODE    151.50 =    1556.00 FEET.

***************************************************************************
   FLOW PROCESS FROM NODE    151.50 TO NODE    152.00 IS CODE =  31
---------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===========================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    69.00  DOWNSTREAM(FEET) =    68.50
   FLOW LENGTH(FEET) =   168.16   MANNING'S N =  0.013
   DEPTH OF FLOW IN  36.0 INCH PIPE IS  24.4 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) =   5.43
   ESTIMATED PIPE DIAMETER(INCH) = 36.00    NUMBER OF PIPES =   1
   PIPE-FLOW(CFS) =       27.72
   PIPE TRAVEL TIME(MIN.) =   0.52   Tc(MIN.) =   21.66
   LONGEST FLOWPATH FROM NODE    148.00 TO NODE    152.00 =    1724.16 FEET.

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```
  FLOW PROCESS FROM NODE    153.00 TO NODE    154.00 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =     70.00  DOWNSTREAM(FEET) =     69.50
```

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

```
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.329
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.541
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
```

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	B	1.50	0.30	0.500	56	14.50
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	C	0.10	0.25	0.500	69	14.50
COMMERCIAL	B	0.60	0.30	0.100	56	11.33

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.391
  SUBAREA RUNOFF(CFS) =      4.80
  TOTAL AREA(ACRES) =     2.20   PEAK FLOW RATE(CFS) =      4.80

****************************************************************************
  FLOW PROCESS FROM NODE    154.00 TO NODE    155.00 IS CODE =  62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =   69.50  DOWNSTREAM ELEVATION(FEET) =   69.00
  STREET LENGTH(FEET) =   403.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.94
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.52
    HALFSTREET FLOOD WIDTH(FEET) =   20.73
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.20
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.62
  STREET FLOW TRAVEL TIME(MIN.) =   5.59   Tc(MIN.) =   16.92
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.019
  SUBAREA LOSS RATE DATA(AMC  II):
```

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	3.80	0.30	0.500	56
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	0.10	0.25	0.500	69
COMMERCIAL	B	1.50	0.30	0.100	56
URBAN POOR COVER					

```
  "TURF"                   B       0.60     0.30    1.000     74
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.450
  SUBAREA AREA(ACRES) =    6.00      SUBAREA RUNOFF(CFS) =   10.17
  EFFECTIVE AREA(ACRES) =      8.20    AREA-AVERAGED Fm(INCH/HR) =  0.13
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.43
  TOTAL AREA(ACRES) =          8.2        PEAK FLOW RATE(CFS) =      13.94

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.56   HALFSTREET FLOOD WIDTH(FEET) =  23.10
  FLOW VELOCITY(FEET/SEC.) =  1.35   DEPTH*VELOCITY(FT*FT/SEC.) =   0.76
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  403.0 FT WITH ELEVATION-DROP =   0.5 FT, IS   12.1 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    155.00
  LONGEST FLOWPATH FROM NODE    153.00 TO NODE    155.00 =    733.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    155.00 TO NODE    156.00 IS CODE =  31
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    69.00  DOWNSTREAM(FEET) =    68.50
  FLOW LENGTH(FEET) =   123.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.16
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       13.94
  PIPE TRAVEL TIME(MIN.) =   0.40    Tc(MIN.) =   17.32
  LONGEST FLOWPATH FROM NODE    153.00 TO NODE    156.00 =    856.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    157.00 TO NODE    158.00 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =     74.00  DOWNSTREAM(FEET) =     72.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.586
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.978
  SUBAREA Tc 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"      C       3.30      0.25      0.500     69   10.99
   COMMERCIAL               C       0.90      0.25      0.100     69    8.59
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.414
   SUBAREA RUNOFF(CFS) =     10.87
   TOTAL AREA(ACRES) =     4.20   PEAK FLOW RATE(CFS) =     10.87

****************************************************************************
  FLOW PROCESS FROM NODE    158.00 TO NODE    159.00 IS CODE =  62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
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UPSTREAM ELEVATION(FEET) =   72.00 DOWNSTREAM ELEVATION(FEET) =   70.00
STREET LENGTH(FEET) =   307.00   CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

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

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   15.33
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) = 0.46
  HALFSTREET FLOOD WIDTH(FEET) =   17.07
  AVERAGE FLOW VELOCITY(FEET/SEC.) =   2.50
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.15
STREET FLOW TRAVEL TIME(MIN.) =   2.04   Tc(MIN.) =   10.63
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.635
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"   C   2.60   0.25   0.500   69
 COMMERCIAL   C   1.30   0.25   0.100   69
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.367
SUBAREA AREA(ACRES) =   3.90   SUBAREA RUNOFF(CFS) =   8.93
EFFECTIVE AREA(ACRES) =   8.10   AREA-AVERAGED Fm(INCH/HR) = 0.10
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.39
TOTAL AREA(ACRES) =   8.1   PEAK FLOW RATE(CFS) =   18.50

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.48   HALFSTREET FLOOD WIDTH(FEET) = 18.40
  FLOW VELOCITY(FEET/SEC.) = 2.62   DEPTH*VELOCITY(FT*FT/SEC.) =   1.27
  LONGEST FLOWPATH FROM NODE   157.00 TO NODE   159.00 =   637.00 FEET.

****
  FLOW PROCESS FROM NODE   159.00 TO NODE   159.50 IS CODE = 62

  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 1 USED)<<<<<
===
  UPSTREAM ELEVATION(FEET) =   70.00 DOWNSTREAM ELEVATION(FEET) =   69.50
  STREET LENGTH(FEET) =   624.00   CURB HEIGHT(INCHES) = 6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   25.34
  STREET FLOWING FULL

    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) = 0.71
    HALFSTREET FLOOD WIDTH(FEET) =   30.61
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   1.38
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   0.98
  STREET FLOW TRAVEL TIME(MIN.) =   7.55   Tc(MIN.) =   18.17
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.938
  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"   C   5.70   0.25   0.500   69
  COMMERCIAL   C   2.50   0.25   0.100   69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.378
  SUBAREA AREA(ACRES) =   8.20   SUBAREA RUNOFF(CFS) =   13.60
  EFFECTIVE AREA(ACRES) =   16.30   AREA-AVERAGED Fm(INCH/HR) = 0.10
  AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.38
  TOTAL AREA(ACRES) =   16.3   PEAK FLOW RATE(CFS) =   27.02

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.73   HALFSTREET FLOOD WIDTH(FEET) = 31.34
  FLOW VELOCITY(FEET/SEC.) = 1.40   DEPTH*VELOCITY(FT*FT/SEC.) =   1.02
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 624.0 FT WITH ELEVATION-DROP =   0.5 FT, IS   14.4 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   159.50
  LONGEST FLOWPATH FROM NODE   157.00 TO NODE   159.50 =   1261.00 FEET.

  ****
  FLOW PROCESS FROM NODE   159.50 TO NODE   160.00 IS CODE = 31

  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
  ==
  ELEVATION DATA: UPSTREAM(FEET) =   69.50 DOWNSTREAM(FEET) =   69.00
  FLOW LENGTH(FEET) =   110.00   MANNING'S N = 0.013
  DEPTH OF FLOW IN 33.0 INCH PIPE IS 22.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.33
  ESTIMATED PIPE DIAMETER(INCH) = 33.00   NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =   27.02
  PIPE TRAVEL TIME(MIN.) =   0.29   Tc(MIN.) =   18.46
  LONGEST FLOWPATH FROM NODE   157.00 TO NODE   160.00 =   1371.00 FEET.

  ****
  FLOW PROCESS FROM NODE   161.00 TO NODE   162.00 IS CODE = 21

  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
  ==
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =   86.00 DOWNSTREAM(FEET) =   85.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   9.862
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751
  SUBAREA Tc 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"   C   1.50   0.25   0.500   69   12.62

```
  COMMERCIAL                      C       0.50     0.25     0.100    69    9.86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
  SUBAREA RUNOFF(CFS) =       4.77
  TOTAL AREA(ACRES) =       2.00   PEAK FLOW RATE(CFS) =      4.77


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  FLOW PROCESS FROM NODE   162.00 TO NODE   163.00 IS CODE =  62
  ------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
  ========================================================================
  UPSTREAM ELEVATION(FEET) =   85.00  DOWNSTREAM ELEVATION(FEET) =   84.00
  STREET LENGTH(FEET) =   437.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.57
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.43
    HALFSTREET FLOOD WIDTH(FEET) =   15.90
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.41
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.61
  STREET FLOW TRAVEL TIME(MIN.) =    5.15   Tc(MIN.) =   15.01
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.162
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL    AREA       Fp        Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR) (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       C      2.10      0.25      0.500     69
  COMMERCIAL                 C      0.80      0.25      0.100     69
  URBAN POOR COVER
  "TURF"                     C      0.10      0.25      1.000     83
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.410
  SUBAREA AREA(ACRES) =    3.00      SUBAREA RUNOFF(CFS) =     5.56
  EFFECTIVE AREA(ACRES) =      5.00    AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.41
  TOTAL AREA(ACRES) =       5.0        PEAK FLOW RATE(CFS) =      9.27

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.46   HALFSTREET FLOOD WIDTH(FEET) = 17.23
  FLOW VELOCITY(FEET/SEC.) = 1.49   DEPTH*VELOCITY(FT*FT/SEC.) =   0.69
  LONGEST FLOWPATH FROM NODE   161.00 TO NODE   163.00 =    767.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE   163.00 TO NODE   164.00 IS CODE =  62
  ------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
  ========================================================================
  UPSTREAM ELEVATION(FEET) =   84.00  DOWNSTREAM ELEVATION(FEET) =   82.00
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STREET LENGTH(FEET) =   283.00   CURB HEIGHT(INCHES) =  6.0
STREET HALFWIDTH(FEET) = 20.00

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

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.59
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.44
  HALFSTREET FLOOD WIDTH(FEET) =   16.05
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.49
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.09
STREET FLOW TRAVEL TIME(MIN.) =   1.89   Tc(MIN.) =   16.90
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.020
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL    AREA      Fp         Ap      SCS
     LAND USE           GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
RESIDENTIAL
"5-7 DWELLINGS/ACRE"       C       3.90      0.25      0.500     69
COMMERCIAL                 C       1.10      0.25      0.100     69
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.412
SUBAREA AREA(ACRES) =    5.00       SUBAREA RUNOFF(CFS) =    8.63
EFFECTIVE AREA(ACRES) =     10.00    AREA-AVERAGED Fm(INCH/HR) =  0.10
AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.41
TOTAL AREA(ACRES) =       10.0        PEAK FLOW RATE(CFS) =      17.26

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.47   HALFSTREET FLOOD WIDTH(FEET) = 17.62
  FLOW VELOCITY(FEET/SEC.) = 2.65   DEPTH*VELOCITY(FT*FT/SEC.) =   1.24
  LONGEST FLOWPATH FROM NODE    161.00 TO NODE    164.00 =    1050.00 FEET.

*************************************************************************
  FLOW PROCESS FROM NODE    164.00 TO NODE    165.00 IS CODE =  62
-----------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
=======================================================================
  UPSTREAM ELEVATION(FEET) =   82.00  DOWNSTREAM ELEVATION(FEET) =   80.00
  STREET LENGTH(FEET) =   584.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.05
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
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   STREET FLOW DEPTH(FEET) =  0.57
   HALFSTREET FLOOD WIDTH(FEET) =   23.71
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.30
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.32
 STREET FLOW TRAVEL TIME(MIN.) =   4.23   Tc(MIN.) =   21.14
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.777
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp        Ap     SCS
      LAND USE           GROUP    (ACRES)  (INCH/HR) (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"      C       7.70      0.25     0.500     69
  COMMERCIAL               C       2.60      0.25     0.100     69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.399
  SUBAREA AREA(ACRES) =   10.30      SUBAREA RUNOFF(CFS) =   15.55
  EFFECTIVE AREA(ACRES) =     20.30    AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =       20.3       PEAK FLOW RATE(CFS) =     30.63

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.61   HALFSTREET FLOOD WIDTH(FEET) =  25.36
  FLOW VELOCITY(FEET/SEC.) =  2.45   DEPTH*VELOCITY(FT*FT/SEC.) =   1.49
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  584.0 FT WITH ELEVATION-DROP =   2.0 FT, IS   21.8 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    165.00
  LONGEST FLOWPATH FROM NODE    161.00 TO NODE    165.00 =   1634.00 FEET.

 *****************************************************************************
   FLOW PROCESS FROM NODE    165.00 TO NODE    166.00 IS CODE =  62
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   >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
 =============================================================================
   UPSTREAM ELEVATION(FEET) =   80.00  DOWNSTREAM ELEVATION(FEET) =    78.00
   STREET LENGTH(FEET) =   939.00   CURB HEIGHT(INCHES) =  6.0
   STREET HALFWIDTH(FEET) = 20.00

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

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
   STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      41.10
     ***STREET FLOWING FULL***
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) =  0.71
     HALFSTREET FLOOD WIDTH(FEET) =   30.55
     AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.24
     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.60
   STREET FLOW TRAVEL TIME(MIN.) =   6.97   Tc(MIN.) =   28.11
   *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.509
   SUBAREA LOSS RATE DATA(AMC  II):
    DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp        Ap     SCS
        LAND USE           GROUP    (ACRES)  (INCH/HR) (DECIMAL)  CN
    RESIDENTIAL
    "5-7 DWELLINGS/ACRE"      C      12.60      0.25     0.500     69
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   COMMERCIAL                   C         3.90      0.25    0.100    69
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.405
   SUBAREA AREA(ACRES) =   16.50      SUBAREA RUNOFF(CFS) =   20.91
   EFFECTIVE AREA(ACRES) =      36.80    AREA-AVERAGED Fm(INCH/HR) =  0.10
   AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
   TOTAL AREA(ACRES) =         36.8         PEAK FLOW RATE(CFS) =      46.64

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 0.74   HALFSTREET FLOOD WIDTH(FEET) =  32.01
   FLOW VELOCITY(FEET/SEC.) =  2.32   DEPTH*VELOCITY(FT*FT/SEC.) =   1.71
   *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
          AND L =  939.0 FT WITH ELEVATION-DROP =   2.0 FT, IS   29.4 CFS,
          WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    166.00
   LONGEST FLOWPATH FROM NODE    161.00 TO NODE    166.00 =   2573.00 FEET.

 **************************************************************************
   FLOW PROCESS FROM NODE    166.00 TO NODE    167.00 IS CODE =  62
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   >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
 ==============================================================================
   UPSTREAM ELEVATION(FEET) =   78.00  DOWNSTREAM ELEVATION(FEET) =    73.00
   STREET LENGTH(FEET) =   761.00   CURB HEIGHT(INCHES) =  6.0
   STREET HALFWIDTH(FEET) = 20.00

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

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
   STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      62.14
     ***STREET FLOWING FULL***
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) =  0.68
     HALFSTREET FLOOD WIDTH(FEET) =    28.96
     AVERAGE FLOW VELOCITY(FEET/SEC.) =     3.78
     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =     2.57
   STREET FLOW TRAVEL TIME(MIN.) =    3.35   Tc(MIN.) =    31.46
   *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.415
   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"        C       18.00     0.25     0.500    69
   COMMERCIAL                  C        7.90     0.25     0.100    69
   URBAN POOR COVER
   "TURF"                      C        0.20     0.25     1.000    83
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.383
   SUBAREA AREA(ACRES) =   26.10      SUBAREA RUNOFF(CFS) =   30.99
   EFFECTIVE AREA(ACRES) =      62.90    AREA-AVERAGED Fm(INCH/HR) =  0.10
   AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
   TOTAL AREA(ACRES) =         62.9         PEAK FLOW RATE(CFS) =      74.51

   END OF SUBAREA STREET FLOW HYDRAULICS:
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   DEPTH(FEET) = 0.72   HALFSTREET FLOOD WIDTH(FEET) =  30.91
   FLOW VELOCITY(FEET/SEC.) =  3.97   DEPTH*VELOCITY(FT*FT/SEC.) =   2.85
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  761.0 FT WITH ELEVATION-DROP =   5.0 FT, IS   56.1 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    167.00
  LONGEST FLOWPATH FROM NODE    161.00 TO NODE    167.00 =   3334.00 FEET.
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**************************************************************************
  FLOW PROCESS FROM NODE    167.00 TO NODE    168.00 IS CODE =  62
--------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
==========================================================================
  UPSTREAM ELEVATION(FEET) =   73.00  DOWNSTREAM ELEVATION(FEET) =   72.00
  STREET LENGTH(FEET) =   291.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      84.87
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.83
    HALFSTREET FLOOD WIDTH(FEET) =   36.59
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.21
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.67
  STREET FLOW TRAVEL TIME(MIN.) =   1.51   Tc(MIN.) =   32.97
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.378
  SUBAREA LOSS RATE DATA(AMC  II):
```

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	12.60	0.25	0.500	69
COMMERCIAL	C	5.10	0.25	0.100	69
URBAN POOR COVER					
"TURF"	C	0.30	0.25	1.000	83

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.395
  SUBAREA AREA(ACRES) =   18.00      SUBAREA RUNOFF(CFS) =   20.72
  EFFECTIVE AREA(ACRES) =     80.90    AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =      80.9       PEAK FLOW RATE(CFS) =      93.10

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.86   HALFSTREET FLOOD WIDTH(FEET) =  37.93
  FLOW VELOCITY(FEET/SEC.) =  3.28   DEPTH*VELOCITY(FT*FT/SEC.) =   2.81
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  291.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   44.9 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    168.00
  LONGEST FLOWPATH FROM NODE    161.00 TO NODE    168.00 =   3625.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    168.00 TO NODE    169.00 IS CODE =  31
```

  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==
  ELEVATION DATA: UPSTREAM(FEET) =   72.00 DOWNSTREAM(FEET) =   70.00
  FLOW LENGTH(FEET) =   621.00   MANNING'S N = 0.013
  DEPTH OF FLOW IN 54.0 INCH PIPE IS 39.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.51
  ESTIMATED PIPE DIAMETER(INCH) = 54.00   NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =   93.10
  PIPE TRAVEL TIME(MIN.) =   1.38   Tc(MIN.) =   34.35
  LONGEST FLOWPATH FROM NODE   161.00 TO NODE   169.00 =   4246.00 FEET.

****
  FLOW PROCESS FROM NODE   170.00 TO NODE   171.00 IS CODE = 21

  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =   68.00 DOWNSTREAM(FEET) =   67.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   9.862
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751
  SUBAREA Tc 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"	C	2.50	0.25	0.500	69	12.62
COMMERCIAL	C	0.70	0.25	0.100	69	9.86

  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.413
  SUBAREA RUNOFF(CFS) =   7.62
  TOTAL AREA(ACRES) =   3.20   PEAK FLOW RATE(CFS) =   7.62

****
  FLOW PROCESS FROM NODE   171.00 TO NODE   172.00 IS CODE = 62

  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 1 USED)<<<<<
==
  UPSTREAM ELEVATION(FEET) =   67.00 DOWNSTREAM ELEVATION(FEET) =   66.00
  STREET LENGTH(FEET) =   398.00   CURB HEIGHT(INCHES) = 6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   11.30
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) = 0.48
    HALFSTREET FLOOD WIDTH(FEET) =   18.32
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   1.61

     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   0.78
    STREET FLOW TRAVEL TIME(MIN.) =   4.11   Tc(MIN.) =   13.98
    * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.253
    SUBAREA LOSS RATE DATA(AMC II):
     DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
         LAND USE   GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
    RESIDENTIAL
    "5-7 DWELLINGS/ACRE"   B   0.60   0.30   0.500   56
    RESIDENTIAL
    "5-7 DWELLINGS/ACRE"   C   2.40   0.25   0.500   69
    COMMERCIAL   B   0.10   0.30   0.100   56
    COMMERCIAL   C   0.70   0.25   0.100   69
    SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26
    SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.416
    SUBAREA AREA(ACRES) =   3.80   SUBAREA RUNOFF(CFS) =   7.33
    EFFECTIVE AREA(ACRES) =   7.00   AREA-AVERAGED Fm(INCH/HR) = 0.11
    AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.41
    TOTAL AREA(ACRES) =   7.0   PEAK FLOW RATE(CFS) =   13.53

    END OF SUBAREA STREET FLOW HYDRAULICS:
    DEPTH(FEET) = 0.51   HALFSTREET FLOOD WIDTH(FEET) = 20.11
    FLOW VELOCITY(FEET/SEC.) = 1.69   DEPTH*VELOCITY(FT*FT/SEC.) =   0.86
    LONGEST FLOWPATH FROM NODE   170.00 TO NODE   172.00 =   728.00 FEET.

    ****
     FLOW PROCESS FROM NODE   172.00 TO NODE   173.00 IS CODE = 62

     >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
     >>>>>(STREET TABLE SECTION # 1 USED)<<<<<
    ===
    UPSTREAM ELEVATION(FEET) =   66.00 DOWNSTREAM ELEVATION(FEET) =   65.50
    STREET LENGTH(FEET) =   435.00   CURB HEIGHT(INCHES) = 6.0
    STREET HALFWIDTH(FEET) = 20.00

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

    SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
    STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
    Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
    Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

      **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   17.75
      STREET FLOWING FULL
      STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
      STREET FLOW DEPTH(FEET) = 0.61
      HALFSTREET FLOOD WIDTH(FEET) =   25.36
      AVERAGE FLOW VELOCITY(FEET/SEC.) =   1.42
      PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   0.86
    STREET FLOW TRAVEL TIME(MIN.) =   5.11   Tc(MIN.) =   19.08
    * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.884
    SUBAREA LOSS RATE DATA(AMC II):
     DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
         LAND USE   GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
    RESIDENTIAL
    "5-7 DWELLINGS/ACRE"   B   3.70   0.30   0.500   56
    RESIDENTIAL
    "5-7 DWELLINGS/ACRE"   C   0.20   0.25   0.500   69
    COMMERCIAL   B   1.40   0.30   0.100   56

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.394
  SUBAREA AREA(ACRES) =    5.30      SUBAREA RUNOFF(CFS) =    8.43
  EFFECTIVE AREA(ACRES) =     12.30   AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.27  AREA-AVERAGED Ap =  0.41
  TOTAL AREA(ACRES) =        12.3       PEAK FLOW RATE(CFS) =      19.63

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.62   HALFSTREET FLOOD WIDTH(FEET) =  26.21
  FLOW VELOCITY(FEET/SEC.) =  1.47   DEPTH*VELOCITY(FT*FT/SEC.) =   0.92
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  435.0 FT WITH ELEVATION-DROP =   0.5 FT, IS   10.5 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    173.00
  LONGEST FLOWPATH FROM NODE    170.00 TO NODE    173.00 =    1163.00 FEET.

*************************************************************************
  FLOW PROCESS FROM NODE    173.00 TO NODE    174.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    65.50  DOWNSTREAM(FEET) =    65.00
  FLOW LENGTH(FEET) =   149.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  21.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =    5.17
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =    1
  PIPE-FLOW(CFS) =       19.63
  PIPE TRAVEL TIME(MIN.) =   0.48    Tc(MIN.) =   19.56
  LONGEST FLOWPATH FROM NODE    170.00 TO NODE    174.00 =    1312.00 FEET.

*************************************************************************
  FLOW PROCESS FROM NODE    175.00 TO NODE    176.00 IS CODE =  21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
===============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =    74.00  DOWNSTREAM(FEET) =    72.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   8.586
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.978
  SUBAREA Tc 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       3.40      0.30      0.500     56    10.99
   COMMERCIAL               B       0.40      0.30      0.100     56     8.59
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.458
  SUBAREA RUNOFF(CFS) =       9.72
  TOTAL AREA(ACRES) =       3.80   PEAK FLOW RATE(CFS) =       9.72

*************************************************************************
  FLOW PROCESS FROM NODE    176.00 TO NODE    177.00 IS CODE =  62
-------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
===============================================================================
  UPSTREAM ELEVATION(FEET) =   72.00  DOWNSTREAM ELEVATION(FEET) =   70.00
```

```
STREET LENGTH(FEET) =   522.00   CURB HEIGHT(INCHES) =  6.0
STREET HALFWIDTH(FEET) = 20.00

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

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.82
  ***STREET FLOWING FULL***
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.53
  HALFSTREET FLOOD WIDTH(FEET) =   21.27
  AVERAGE FLOW VELOCITY(FEET/SEC.) =     2.16
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =     1.14
STREET FLOW TRAVEL TIME(MIN.) =   4.02   Tc(MIN.) =   12.61
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.390
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL    AREA      Fp         Ap     SCS
     LAND USE           GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
RESIDENTIAL
"5-7 DWELLINGS/ACRE"       B       7.90      0.30      0.500    56
COMMERCIAL                 B       1.00      0.30      0.100    56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.455
SUBAREA AREA(ACRES) =    8.90      SUBAREA RUNOFF(CFS) =   18.05
EFFECTIVE AREA(ACRES) =     12.70    AREA-AVERAGED Fm(INCH/HR) =  0.14
AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.46
TOTAL AREA(ACRES) =       12.7        PEAK FLOW RATE(CFS) =      25.75

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.57   HALFSTREET FLOOD WIDTH(FEET) =  23.47
FLOW VELOCITY(FEET/SEC.) =  2.42   DEPTH*VELOCITY(FT*FT/SEC.) =   1.38
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L =  522.0 FT WITH ELEVATION-DROP =   2.0 FT, IS   19.3 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    177.00
LONGEST FLOWPATH FROM NODE    175.00 TO NODE    177.00 =     852.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    177.00 TO NODE    178.00 IS CODE =  62
--------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
==========================================================================
  UPSTREAM ELEVATION(FEET) =   70.00  DOWNSTREAM ELEVATION(FEET) =   68.00
  STREET LENGTH(FEET) =    539.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200
```

```
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      36.00
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.63
   HALFSTREET FLOOD WIDTH(FEET) =   26.40
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.65
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.66
 STREET FLOW TRAVEL TIME(MIN.) =   3.39   Tc(MIN.) =   15.99
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.085
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE          GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"       B      10.90     0.30      0.500     56
 COMMERCIAL                 B       0.80     0.30      0.100     56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.473
 SUBAREA AREA(ACRES) =   11.70     SUBAREA RUNOFF(CFS) =   20.46
 EFFECTIVE AREA(ACRES) =    24.40   AREA-AVERAGED Fm(INCH/HR) =  0.14
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.46
 TOTAL AREA(ACRES) =       24.4      PEAK FLOW RATE(CFS) =     42.73

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.66   HALFSTREET FLOOD WIDTH(FEET) = 28.05
 FLOW VELOCITY(FEET/SEC.) =  2.78   DEPTH*VELOCITY(FT*FT/SEC.) =   1.84
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  539.0 FT WITH ELEVATION-DROP =   2.0 FT, IS   25.0 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    178.00
 LONGEST FLOWPATH FROM NODE    175.00 TO NODE    178.00 =   1391.00 FEET.

 *****************************************************************************
  FLOW PROCESS FROM NODE    178.00 TO NODE    179.00 IS CODE =  62
 ----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
 ============================================================================
  UPSTREAM ELEVATION(FEET) =   68.00  DOWNSTREAM ELEVATION(FEET) =    66.00
  STREET LENGTH(FEET) = 1457.00   CURB HEIGHT(INCHES) = 8.0
  STREET HALFWIDTH(FEET) = 42.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  21.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      60.95
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.93
    HALFSTREET FLOOD WIDTH(FEET) =   51.77
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.81
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.69
  STREET FLOW TRAVEL TIME(MIN.) =  13.40   Tc(MIN.) =   29.40
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.471
  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     15.00     0.30     0.500    56
   COMMERCIAL               B     14.20     0.30     0.100    56
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.305
   SUBAREA AREA(ACRES) =   29.20     SUBAREA RUNOFF(CFS) =   36.25
   EFFECTIVE AREA(ACRES) =     53.60    AREA-AVERAGED Fm(INCH/HR) =  0.11
   AREA-AVERAGED Fp(INCH/HR) = 0.30  AREA-AVERAGED Ap = 0.38
   TOTAL AREA(ACRES) =       53.6        PEAK FLOW RATE(CFS) =      65.50

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 0.95   HALFSTREET FLOOD WIDTH(FEET) = 53.74
   FLOW VELOCITY(FEET/SEC.) = 1.83   DEPTH*VELOCITY(FT*FT/SEC.) =  1.74
   *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1457.0 FT WITH ELEVATION-DROP =  2.0 FT, IS   44.6 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    179.00
   LONGEST FLOWPATH FROM NODE    175.00 TO NODE    179.00 =   2848.00 FEET.

***************************************************************************
   FLOW PROCESS FROM NODE    179.00 TO NODE    180.00 IS CODE =  62
-------------------------------------------------------------------------------
   >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
===============================================================================
   UPSTREAM ELEVATION(FEET) =   66.00  DOWNSTREAM ELEVATION(FEET) =   65.50
   STREET LENGTH(FEET) =  1087.00   CURB HEIGHT(INCHES) =  8.0
   STREET HALFWIDTH(FEET) = 42.00

   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  21.00
   INSIDE STREET CROSSFALL(DECIMAL) =  0.020
   OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
   STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      81.22
     ***STREET FLOWING FULL***
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) = 1.16
     HALFSTREET FLOOD WIDTH(FEET) =   66.91
     AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.31
     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.52
   STREET FLOW TRAVEL TIME(MIN.) = 13.84   Tc(MIN.) =   43.24
   *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.179
   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      2.90     0.30     0.500    56
   COMMERCIAL                B      5.40     0.30     0.100    56
   COMMERCIAL                C      0.30     0.25     0.100    69
   URBAN POOR COVER
   "TURF"                    B     19.10     0.30     1.000    74
   SCHOOL                    B      7.60     0.30     0.600    56
   SCHOOL                    C      0.80     0.25     0.600    69
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.725
```

```
                                      GC10EX
   SUBAREA AREA(ACRES) =   36.10       SUBAREA RUNOFF(CFS) =    31.27
   EFFECTIVE AREA(ACRES) =     89.70    AREA-AVERAGED Fm(INCH/HR) =  0.15
   AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.52
   TOTAL AREA(ACRES) =         89.7        PEAK FLOW RATE(CFS) =      82.70

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 1.17   HALFSTREET FLOOD WIDTH(FEET) =  67.22
   FLOW VELOCITY(FEET/SEC.) =  1.32   DEPTH*VELOCITY(FT*FT/SEC.) =   1.54
   *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1087.0 FT WITH ELEVATION-DROP =   0.5 FT, IS   47.7 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    180.00
   LONGEST FLOWPATH FROM NODE    175.00 TO NODE    180.00 =   3935.00 FEET.

   **************************************************************************
   FLOW PROCESS FROM NODE    180.00 TO NODE    181.00 IS CODE =   31
   --------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
   ==========================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    65.50  DOWNSTREAM(FEET) =    65.00
   FLOW LENGTH(FEET) =    61.00   MANNING'S N =  0.013
   DEPTH OF FLOW IN  42.0 INCH PIPE IS  32.9 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) =  10.23
   ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =    1
   PIPE-FLOW(CFS) =        82.70
   PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =    43.34
   LONGEST FLOWPATH FROM NODE    175.00 TO NODE    181.00 =   3996.00 FEET.

   **************************************************************************
   FLOW PROCESS FROM NODE    181.10 TO NODE    181.20 IS CODE =   21
   --------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
   >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
   ==========================================================================
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
   ELEVATION DATA: UPSTREAM(FEET) =     75.00  DOWNSTREAM(FEET) =     74.00

   Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
   SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.862
   *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.751
   SUBAREA Tc 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"      C        0.60      0.25      0.500     69    12.62
   COMMERCIAL                C        1.30      0.25      0.100     69     9.86
   URBAN POOR COVER
   "TURF"                    C        0.20      0.25      1.000     83    17.03
   SCHOOL                    C        2.10      0.25      0.600     69    13.37
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.450
   SUBAREA RUNOFF(CFS) =       9.97
   TOTAL AREA(ACRES) =      4.20   PEAK FLOW RATE(CFS) =       9.97

   **************************************************************************
   FLOW PROCESS FROM NODE    181.20 TO NODE    181.30 IS CODE =   62
   --------------------------------------------------------------------------
   >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
   ==========================================================================
                                        59
```

UPSTREAM ELEVATION(FEET) =   74.00 DOWNSTREAM ELEVATION(FEET) =   72.50
STREET LENGTH(FEET) =   711.00   CURB HEIGHT(INCHES) = 8.0
STREET HALFWIDTH(FEET) = 42.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   17.65
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) = 0.61
  HALFSTREET FLOOD WIDTH(FEET) =   22.44
  AVERAGE FLOW VELOCITY(FEET/SEC.) =   1.69
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.03
STREET FLOW TRAVEL TIME(MIN.) =   7.01   Tc(MIN.) =   16.87
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.022
SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
     LAND USE   GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"   C   5.30   0.25   0.500   69
 COMMERCIAL   C   2.50   0.25   0.100   69
 SCHOOL   C   1.00   0.25   0.600   69
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.398
 SUBAREA AREA(ACRES) =   8.80   SUBAREA RUNOFF(CFS) =   15.23
 EFFECTIVE AREA(ACRES) =   13.00   AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.41
 TOTAL AREA(ACRES) =   13.0   PEAK FLOW RATE(CFS) =   22.44

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.65   HALFSTREET FLOOD WIDTH(FEET) = 24.65
 FLOW VELOCITY(FEET/SEC.) = 1.79   DEPTH*VELOCITY(FT*FT/SEC.) =   1.17
 LONGEST FLOWPATH FROM NODE   181.10 TO NODE   181.30 =   1041.00 FEET.

 ****
  FLOW PROCESS FROM NODE   181.30 TO NODE   181.40 IS CODE = 62

  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 2 USED)<<<<<
 ===
  UPSTREAM ELEVATION(FEET) =   72.50 DOWNSTREAM ELEVATION(FEET) =   72.00
  STREET LENGTH(FEET) =   216.00   CURB HEIGHT(INCHES) = 8.0
  STREET HALFWIDTH(FEET) = 42.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   39.68

```
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.76
   HALFSTREET FLOOD WIDTH(FEET) =   34.71
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.10
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.60
 STREET FLOW TRAVEL TIME(MIN.) =   1.71   Tc(MIN.) =   18.59
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.913
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA     Fp        Ap     SCS
      LAND USE           GROUP   (ACRES)  (INCH/HR) (DECIMAL)  CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"       C      13.20     0.25     0.500    69
 COMMERCIAL                 C       6.20     0.25     0.100    69
 URBAN POOR COVER
 "TURF"                     C       1.80     0.25     1.000    83
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.425
 SUBAREA AREA(ACRES) =   21.20      SUBAREA RUNOFF(CFS) =   34.47
 EFFECTIVE AREA(ACRES) =     34.20    AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.42
 TOTAL AREA(ACRES) =      34.2       PEAK FLOW RATE(CFS) =      55.64

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.84   HALFSTREET FLOOD WIDTH(FEET) = 42.75
 FLOW VELOCITY(FEET/SEC.) = 2.22   DEPTH*VELOCITY(FT*FT/SEC.) =   1.86
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  216.0 FT WITH ELEVATION-DROP =   0.5 FT, IS   54.0 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    181.40
 LONGEST FLOWPATH FROM NODE    181.10 TO NODE    181.40 =   1257.00 FEET.

 **************************************************************************
  FLOW PROCESS FROM NODE    181.40 TO NODE    181.50 IS CODE =  62
 ----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
 ============================================================================
  UPSTREAM ELEVATION(FEET) =   72.00  DOWNSTREAM ELEVATION(FEET) =   69.00
  STREET LENGTH(FEET) =   690.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 42.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  21.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      74.39
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.83
    HALFSTREET FLOOD WIDTH(FEET) =   42.09
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.03
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.52
 STREET FLOW TRAVEL TIME(MIN.) =   3.80   Tc(MIN.) =   22.38
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.720
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA     Fp        Ap     SCS
      LAND USE           GROUP   (ACRES)  (INCH/HR) (DECIMAL)  CN
```

```
   RESIDENTIAL
   "5-7 DWELLINGS/ACRE"        B       5.60      0.30      0.500     56
   RESIDENTIAL
   "5-7 DWELLINGS/ACRE"        C      13.70      0.25      0.500     69
   COMMERCIAL                  B       1.80      0.30      0.100     56
   COMMERCIAL                  C       4.70      0.25      0.100     69
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.26
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.399
   SUBAREA AREA(ACRES) =   25.80      SUBAREA RUNOFF(CFS) =   37.48
   EFFECTIVE AREA(ACRES) =      60.00    AREA-AVERAGED Fm(INCH/HR) =  0.11
   AREA-AVERAGED Fp(INCH/HR) =  0.26  AREA-AVERAGED Ap =  0.41
   TOTAL AREA(ACRES) =       60.0        PEAK FLOW RATE(CFS) =     87.17

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 0.87   HALFSTREET FLOOD WIDTH(FEET) = 46.03
   FLOW VELOCITY(FEET/SEC.) =  3.11   DEPTH*VELOCITY(FT*FT/SEC.) =   2.71
   *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
          AND L =  690.0 FT WITH ELEVATION-DROP =   3.0 FT, IS   53.8 CFS,
          WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    181.50
   LONGEST FLOWPATH FROM NODE    181.10 TO NODE    181.50 =    1947.00 FEET.

 **************************************************************************
   FLOW PROCESS FROM NODE    181.50 TO NODE    181.60 IS CODE =  62
 -------------------------------------------------------------------------------
   >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
 ===============================================================================
   UPSTREAM ELEVATION(FEET) =  69.00  DOWNSTREAM ELEVATION(FEET) =   66.50
   STREET LENGTH(FEET) =   623.00   CURB HEIGHT(INCHES) =  8.0
   STREET HALFWIDTH(FEET) = 42.00

   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  21.00
   INSIDE STREET CROSSFALL(DECIMAL) =  0.020
   OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
   STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     105.55
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) =  0.93
     HALFSTREET FLOOD WIDTH(FEET) =    52.10
     AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.11
     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.90
   STREET FLOW TRAVEL TIME(MIN.) =   3.34   Tc(MIN.) =    25.73
   *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.588
   SUBAREA LOSS RATE DATA(AMC  II):
    DEVELOPMENT TYPE/       SCS SOIL    AREA      Fp         Ap      SCS
        LAND USE            GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
   RESIDENTIAL
   "5-7 DWELLINGS/ACRE"        B       5.60      0.30      0.500     56
   RESIDENTIAL
   "5-7 DWELLINGS/ACRE"        C      12.90      0.25      0.500     69
   COMMERCIAL                  B       3.80      0.30      0.100     56
   COMMERCIAL                  C       5.10      0.25      0.100     69
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.370
   SUBAREA AREA(ACRES) =   27.40      SUBAREA RUNOFF(CFS) =   36.73
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EFFECTIVE AREA(ACRES) =      87.40    AREA-AVERAGED Fm(INCH/HR) =  0.10
AREA-AVERAGED Fp(INCH/HR) =  0.26  AREA-AVERAGED Ap =  0.40
TOTAL AREA(ACRES) =         87.4        PEAK FLOW RATE(CFS) =     116.79

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.96   HALFSTREET FLOOD WIDTH(FEET) =  54.89
FLOW VELOCITY(FEET/SEC.) =  3.16   DEPTH*VELOCITY(FT*FT/SEC.) =   3.04
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  623.0 FT WITH ELEVATION-DROP =   2.5 FT, IS   58.1 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    181.60
LONGEST FLOWPATH FROM NODE     181.10 TO NODE     181.60 =   2570.00 FEET.

*************************************************************************
  FLOW PROCESS FROM NODE    181.60 TO NODE    181.70 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     66.50  DOWNSTREAM(FEET) =    66.00
  FLOW LENGTH(FEET) =     93.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  51.0 INCH PIPE IS  41.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.44
  ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      116.79
  PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =   25.89
  LONGEST FLOWPATH FROM NODE     181.10 TO NODE     181.70 =   2663.00 FEET.

*************************************************************************
  FLOW PROCESS FROM NODE    182.00 TO NODE    183.00 IS CODE =  21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
===============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =     62.50  DOWNSTREAM(FEET) =     62.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.329
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =   2.541
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
```

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	B	1.20	0.30	0.500	56	14.50
COMMERCIAL	B	0.60	0.30	0.100	56	11.33

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.367
  SUBAREA RUNOFF(CFS) =      3.94
  TOTAL AREA(ACRES) =       1.80   PEAK FLOW RATE(CFS) =      3.94

*************************************************************************
  FLOW PROCESS FROM NODE    183.00 TO NODE    184.00 IS CODE =  62
-------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
===============================================================================
  UPSTREAM ELEVATION(FEET) =   62.00  DOWNSTREAM ELEVATION(FEET) =   61.00
  STREET LENGTH(FEET) =    513.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00
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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) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =        6.50
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) =  0.42
     HALFSTREET FLOOD WIDTH(FEET) =   15.43
     AVERAGE FLOW VELOCITY(FEET/SEC.) =     1.29
     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =     0.55
   STREET FLOW TRAVEL TIME(MIN.) =   6.65   Tc(MIN.) =   17.98
   *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.950
   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       2.40      0.30      0.500     56
   COMMERCIAL                  B       0.70      0.30      0.100     56
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.410
   SUBAREA AREA(ACRES) =    3.10       SUBAREA RUNOFF(CFS) =    5.10
   EFFECTIVE AREA(ACRES) =      4.90    AREA-AVERAGED Fm(INCH/HR) =  0.12
   AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.39
   TOTAL AREA(ACRES) =        4.9        PEAK FLOW RATE(CFS) =       8.08

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 0.45   HALFSTREET FLOOD WIDTH(FEET) =  16.84
   FLOW VELOCITY(FEET/SEC.) =  1.35   DEPTH*VELOCITY(FT*FT/SEC.) =   0.61
   LONGEST FLOWPATH FROM NODE    182.00 TO NODE    184.00 =    843.00 FEET.

 ***************************************************************************
   FLOW PROCESS FROM NODE    184.00 TO NODE    185.00 IS CODE =  62
 -----------------------------------------------------------------------------
   >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
 =============================================================================
   UPSTREAM ELEVATION(FEET) =   61.00  DOWNSTREAM ELEVATION(FEET) =   60.00
   STREET LENGTH(FEET) =    574.00   CURB HEIGHT(INCHES) =  6.0
   STREET HALFWIDTH(FEET) = 20.00

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

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
   STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       16.87
     ***STREET FLOWING FULL***
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) =  0.57
     HALFSTREET FLOOD WIDTH(FEET) =   23.28
     AVERAGE FLOW VELOCITY(FEET/SEC.) =     1.61
```

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   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.91
  STREET FLOW TRAVEL TIME(MIN.) =   5.95   Tc(MIN.) =   23.93
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.655
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/     SCS SOIL    AREA      Fp        Ap     SCS
       LAND USE          GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"        B       8.70     0.30     0.500     56
  COMMERCIAL                  B       3.90     0.30     0.100     56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.376
  SUBAREA AREA(ACRES) =   12.60      SUBAREA RUNOFF(CFS) =   17.49
  EFFECTIVE AREA(ACRES) =      17.50    AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.38
  TOTAL AREA(ACRES) =        17.5       PEAK FLOW RATE(CFS) =     24.27

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.63   HALFSTREET FLOOD WIDTH(FEET) =  26.28
  FLOW VELOCITY(FEET/SEC.) =  1.80   DEPTH*VELOCITY(FT*FT/SEC.) =   1.13
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  574.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   24.5 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    185.00
  LONGEST FLOWPATH FROM NODE    182.00 TO NODE    185.00 =   1417.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    185.00 TO NODE    186.00 IS CODE =  31
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    60.00  DOWNSTREAM(FEET) =    59.00
  FLOW LENGTH(FEET) =   580.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  27.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.22
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       24.27
  PIPE TRAVEL TIME(MIN.) =   2.29    Tc(MIN.) =   26.22
  LONGEST FLOWPATH FROM NODE    182.00 TO NODE    186.00 =   1997.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    186.00 TO NODE    186.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  MAINLINE Tc(MIN.) =   26.22
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.571
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/     SCS SOIL    AREA      Fp        Ap     SCS
       LAND USE          GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"        B      10.20     0.30     0.500     56
  COMMERCIAL                  B       5.20     0.30     0.100     56
  URBAN POOR COVER
  "TURF"                      B       0.20     0.30     1.000     74
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.373
  SUBAREA AREA(ACRES) =   15.60      SUBAREA RUNOFF(CFS) =   20.48
  EFFECTIVE AREA(ACRES) =      33.10    AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.38
  TOTAL AREA(ACRES) =        33.1       PEAK FLOW RATE(CFS) =     43.42
```

```
**************************************************************************
  FLOW PROCESS FROM NODE    187.00 TO NODE    188.00 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =     72.00  DOWNSTREAM(FEET) =    70.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.586
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.978
  SUBAREA Tc 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"       C       1.60     0.25      0.500     69  10.99
  COMMERCIAL                 C       5.80     0.25      0.100     69   8.59
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.186
  SUBAREA RUNOFF(CFS) =      19.52
  TOTAL AREA(ACRES) =      7.40   PEAK FLOW RATE(CFS) =     19.52

**************************************************************************
  FLOW PROCESS FROM NODE    188.00 TO NODE    189.00 IS CODE =  62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
==========================================================================
  UPSTREAM ELEVATION(FEET) =   70.00  DOWNSTREAM ELEVATION(FEET) =   68.00
  STREET LENGTH(FEET) =   447.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      31.51
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.59
    HALFSTREET FLOOD WIDTH(FEET) =   24.44
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.72
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.60
  STREET FLOW TRAVEL TIME(MIN.) =   2.74   Tc(MIN.) =   11.33
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.541
  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"       C       3.60     0.25      0.500     69
  COMMERCIAL                 C       7.10     0.25      0.100     69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.235
```

GC10EX

SUBAREA AREA(ACRES) =   10.70   SUBAREA RUNOFF(CFS) =   23.90
EFFECTIVE AREA(ACRES) =   18.10   AREA-AVERAGED Fm(INCH/HR) = 0.05
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.21
TOTAL AREA(ACRES) =   18.1   PEAK FLOW RATE(CFS) =   40.51

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.63   HALFSTREET FLOOD WIDTH(FEET) = 26.64
FLOW VELOCITY(FEET/SEC.) = 2.93   DEPTH*VELOCITY(FT*FT/SEC.) = 1.85
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 447.0 FT WITH ELEVATION-DROP =   2.0 FT, IS   25.3 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   189.00
LONGEST FLOWPATH FROM NODE   187.00 TO NODE   189.00 =   777.00 FEET.

****
  FLOW PROCESS FROM NODE   189.00 TO NODE   190.00 IS CODE = 62

  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 1 USED)<<<<<
==
  UPSTREAM ELEVATION(FEET) =   68.00 DOWNSTREAM ELEVATION(FEET) =   63.00
  STREET LENGTH(FEET) = 1345.00   CURB HEIGHT(INCHES) = 6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   69.18
    STREET FLOWING FULL
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) = 0.77
    HALFSTREET FLOOD WIDTH(FEET) =   33.42
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   3.15
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   2.42
  STREET FLOW TRAVEL TIME(MIN.) =   7.12   Tc(MIN.) =   18.45
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.921
  SUBAREA LOSS RATE DATA(AMC II):
   DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
       LAND USE   GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"   B   5.70   0.30   0.500   56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"   C   14.70   0.25   0.500   69
  COMMERCIAL   B   2.20   0.30   0.100   56
  COMMERCIAL   C   11.90   0.25   0.100   69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.26
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.337
  SUBAREA AREA(ACRES) =   34.50   SUBAREA RUNOFF(CFS) =   56.90
  EFFECTIVE AREA(ACRES) =   52.60   AREA-AVERAGED Fm(INCH/HR) = 0.08
  AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.29
  TOTAL AREA(ACRES) =   52.6   PEAK FLOW RATE(CFS) =   87.33

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.83   HALFSTREET FLOOD WIDTH(FEET) = 36.47
  FLOW VELOCITY(FEET/SEC.) = 3.33   DEPTH*VELOCITY(FT*FT/SEC.) =   2.76

```
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1345.0 FT WITH ELEVATION-DROP =   5.0 FT, IS   60.6 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    190.00
  LONGEST FLOWPATH FROM NODE     187.00 TO NODE    190.00 =   2122.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    190.00 TO NODE    194.00 IS CODE =  31
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    63.00  DOWNSTREAM(FEET) =    62.00
  FLOW LENGTH(FEET) =   522.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  57.0 INCH PIPE IS  43.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.04
  ESTIMATED PIPE DIAMETER(INCH) =  57.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =        87.33
  PIPE TRAVEL TIME(MIN.) =   1.44    Tc(MIN.) =   19.89
  LONGEST FLOWPATH FROM NODE     187.00 TO NODE    194.00 =   2644.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    194.00 TO NODE    194.00 IS CODE =   1
--------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   19.89
  RAINFALL INTENSITY(INCH/HR) =   1.84
  AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.26
  AREA-AVERAGED Ap =  0.29
  EFFECTIVE STREAM AREA(ACRES) =      52.60
  TOTAL STREAM AREA(ACRES) =      52.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      87.33

**************************************************************************
  FLOW PROCESS FROM NODE    191.00 TO NODE    192.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =     68.00  DOWNSTREAM(FEET) =    66.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.586
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.978
  SUBAREA Tc 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      1.90     0.30     0.500    56   10.99
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"      C      0.50     0.25     0.500    69   10.99
  COMMERCIAL               B      0.50     0.30     0.100    56    8.59
  COMMERCIAL               C      0.10     0.25     0.100    69    8.59
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.420
  SUBAREA RUNOFF(CFS) =        7.71
```

  TOTAL AREA(ACRES) =   3.00   PEAK FLOW RATE(CFS) =   7.71

****
  FLOW PROCESS FROM NODE   192.00 TO NODE   193.00 IS CODE = 62

  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 1 USED)<<<<<
==
  UPSTREAM ELEVATION(FEET) =   66.00 DOWNSTREAM ELEVATION(FEET) =   64.00
  STREET LENGTH(FEET) =   548.00   CURB HEIGHT(INCHES) = 6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   13.59
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) = 0.48
    HALFSTREET FLOOD WIDTH(FEET) =   18.32
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   1.94
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   0.94
  STREET FLOW TRAVEL TIME(MIN.) =   4.71   Tc(MIN.) =   13.29
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.318
  SUBAREA LOSS RATE DATA(AMC II):
   DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
       LAND USE   GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"   B   4.30   0.30   0.500   56
  COMMERCIAL   B   1.60   0.30   0.100   56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.392
  SUBAREA AREA(ACRES) =   5.90   SUBAREA RUNOFF(CFS) =   11.68
  EFFECTIVE AREA(ACRES) =   8.90   AREA-AVERAGED Fm(INCH/HR) = 0.12
  AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.40
  TOTAL AREA(ACRES) =   8.9   PEAK FLOW RATE(CFS) =   17.62

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.52   HALFSTREET FLOOD WIDTH(FEET) = 21.03
  FLOW VELOCITY(FEET/SEC.) = 2.08   DEPTH*VELOCITY(FT*FT/SEC.) =   1.08
  LONGEST FLOWPATH FROM NODE   191.00 TO NODE   193.00 =   878.00 FEET.

****
  FLOW PROCESS FROM NODE   193.00 TO NODE   194.00 IS CODE = 62

  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 1 USED)<<<<<
==
  UPSTREAM ELEVATION(FEET) =   64.00 DOWNSTREAM ELEVATION(FEET) =   62.00
  STREET LENGTH(FEET) =   767.00   CURB HEIGHT(INCHES) = 6.0
  STREET HALFWIDTH(FEET) = 20.00

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

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   25.30
  STREET FLOWING FULL
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) = 0.60
  HALFSTREET FLOOD WIDTH(FEET) =   24.87
  AVERAGE FLOW VELOCITY(FEET/SEC.) =   2.11
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.26
STREET FLOW TRAVEL TIME(MIN.) =   6.07   Tc(MIN.) =   19.37
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.869
SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
     LAND USE   GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"5-7 DWELLINGS/ACRE"   B   6.90   0.30   0.500   56
COMMERCIAL   B   2.80   0.30   0.100   56
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.385
SUBAREA AREA(ACRES) =   9.70   SUBAREA RUNOFF(CFS) =   15.31
EFFECTIVE AREA(ACRES) =   18.60   AREA-AVERAGED Fm(INCH/HR) = 0.12
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.39
TOTAL AREA(ACRES) =   18.6   PEAK FLOW RATE(CFS) =   29.32

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.62   HALFSTREET FLOOD WIDTH(FEET) = 26.15
  FLOW VELOCITY(FEET/SEC.) = 2.20   DEPTH*VELOCITY(FT*FT/SEC.) =   1.37
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 767.0 FT WITH ELEVATION-DROP =   2.0 FT, IS   18.4 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   194.00
LONGEST FLOWPATH FROM NODE   191.00 TO NODE   194.00 =   1645.00 FEET.

****
  FLOW PROCESS FROM NODE   194.00 TO NODE   194.00 IS CODE =   1

  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==
  TOTAL NUMBER OF STREAMS = 2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
  TIME OF CONCENTRATION(MIN.) =   19.37
  RAINFALL INTENSITY(INCH/HR) =   1.87
  AREA-AVERAGED Fm(INCH/HR) = 0.12
  AREA-AVERAGED Fp(INCH/HR) = 0.30
  AREA-AVERAGED Ap = 0.39
  EFFECTIVE STREAM AREA(ACRES) =   18.60
  TOTAL STREAM AREA(ACRES) =   18.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   29.32

  ** CONFLUENCE DATA **
  STREAM   Q   Tc   Intensity   Fp(Fm)   Ap   Ae   HEADWATER
  NUMBER   (CFS) (MIN.) (INCH/HR) (INCH/HR)   (ACRES)   NODE
     1   87.33   19.89   1.840   0.26(0.08) 0.29   52.6   187.00
     2   29.32   19.37   1.869   0.30(0.12) 0.39   18.6   191.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO

CONFLUENCE FORMULA USED FOR 2 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	115.72	19.37	1.869	0.27(0.09)	0.32	69.8	191.00
2	116.17	19.89	1.840	0.27(0.09)	0.32	71.2	187.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =   116.17   Tc(MIN.) =   19.89
EFFECTIVE AREA(ACRES) =   71.20   AREA-AVERAGED Fm(INCH/HR) = 0.09
AREA-AVERAGED Fp(INCH/HR) = 0.27 AREA-AVERAGED Ap = 0.32
TOTAL AREA(ACRES) =   71.2
LONGEST FLOWPATH FROM NODE   187.00 TO NODE   194.00 =   2644.00 FEET.

****
  FLOW PROCESS FROM NODE   194.00 TO NODE   198.00 IS CODE = 31

  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===
  ELEVATION DATA: UPSTREAM(FEET) =   62.00 DOWNSTREAM(FEET) =   61.00
  FLOW LENGTH(FEET) =   265.00   MANNING'S N = 0.013
  DEPTH OF FLOW IN 57.0 INCH PIPE IS 41.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.43
  ESTIMATED PIPE DIAMETER(INCH) = 57.00   NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =   116.17
  PIPE TRAVEL TIME(MIN.) =   0.52   Tc(MIN.) =   20.41
  LONGEST FLOWPATH FROM NODE   187.00 TO NODE   198.00 =   2909.00 FEET.

****
  FLOW PROCESS FROM NODE   198.00 TO NODE   198.00 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.) =   20.41
  RAINFALL INTENSITY(INCH/HR) =   1.81
  AREA-AVERAGED Fm(INCH/HR) = 0.09
  AREA-AVERAGED Fp(INCH/HR) = 0.27
  AREA-AVERAGED Ap = 0.32
  EFFECTIVE STREAM AREA(ACRES) =   71.20
  TOTAL STREAM AREA(ACRES) =   71.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   116.17

****
  FLOW PROCESS FROM NODE   195.00 TO NODE   196.00 IS CODE = 21

  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
===
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =   66.00 DOWNSTREAM(FEET) =   64.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   8.586
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.978
  SUBAREA Tc 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	1.40	0.30	0.500	56	10.99
COMMERCIAL	B	0.70	0.30	0.100	56	8.59
URBAN POOR COVER						
"TURF"	B	0.40	0.30	1.000	74	14.83

```
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.468
 SUBAREA RUNOFF(CFS) =     6.38
 TOTAL AREA(ACRES) =    2.50   PEAK FLOW RATE(CFS) =      6.38

****************************************************************************
 FLOW PROCESS FROM NODE    196.00 TO NODE    197.00 IS CODE =  62
--------------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
 UPSTREAM ELEVATION(FEET) =   64.00  DOWNSTREAM ELEVATION(FEET) =   62.00
 STREET LENGTH(FEET) =   384.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 20.00

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.23
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.41
   HALFSTREET FLOOD WIDTH(FEET) =   14.57
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.03
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.83
 STREET FLOW TRAVEL TIME(MIN.) =   3.15   Tc(MIN.) =   11.73
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.490
 SUBAREA LOSS RATE DATA(AMC  II):
```

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	1.80	0.30	0.500	56
COMMERCIAL	B	0.50	0.30	0.100	56
URBAN POOR COVER					
"TURF"	B	0.40	0.30	1.000	74

```
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.500
 SUBAREA AREA(ACRES) =    2.70      SUBAREA RUNOFF(CFS) =    5.69
 EFFECTIVE AREA(ACRES) =      5.20    AREA-AVERAGED Fm(INCH/HR) =  0.15
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.48
 TOTAL AREA(ACRES) =       5.2       PEAK FLOW RATE(CFS) =      10.97

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.43   HALFSTREET FLOOD WIDTH(FEET) =  15.66
 FLOW VELOCITY(FEET/SEC.) =  2.11   DEPTH*VELOCITY(FT*FT/SEC.) =   0.91
 LONGEST FLOWPATH FROM NODE    195.00 TO NODE    197.00 =    714.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    197.00 TO NODE    198.00 IS CODE =  62
```

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =   62.00  DOWNSTREAM ELEVATION(FEET) =   61.00
  STREET LENGTH(FEET) =   585.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.40
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.54
    HALFSTREET FLOOD WIDTH(FEET) =   22.19
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.52
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.82
  STREET FLOW TRAVEL TIME(MIN.) =   6.43   Tc(MIN.) =   18.16
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.939
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR) (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B      2.60     0.30     0.500     56
  COMMERCIAL                 B      1.10     0.30     0.100     56
  URBAN POOR COVER
  "TURF"                     B      0.50     0.30     1.000     74
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.455
  SUBAREA AREA(ACRES) =    4.20       SUBAREA RUNOFF(CFS) =    6.81
  EFFECTIVE AREA(ACRES) =     9.40    AREA-AVERAGED Fm(INCH/HR) =  0.14
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.47
  TOTAL AREA(ACRES) =        9.4        PEAK FLOW RATE(CFS) =     15.21

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.55   HALFSTREET FLOOD WIDTH(FEET) = 22.55
  FLOW VELOCITY(FEET/SEC.) = 1.55   DEPTH*VELOCITY(FT*FT/SEC.) =   0.85
  LONGEST FLOWPATH FROM NODE    195.00 TO NODE    198.00 =   1299.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    198.00 TO NODE    198.00 IS CODE =    1
--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   18.16
  RAINFALL INTENSITY(INCH/HR) =   1.94
  AREA-AVERAGED Fm(INCH/HR) =  0.14
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.47
  EFFECTIVE STREAM AREA(ACRES) =        9.40
```

```
 TOTAL STREAM AREA(ACRES) =        9.40
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       15.21

 ** CONFLUENCE DATA **
 STREAM      Q      Tc   Intensity  Fp(Fm)     Ap      Ae    HEADWATER
 NUMBER    (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
    1     115.72  19.89    1.840   0.27( 0.09) 0.32    69.8     191.00
    1     116.17  20.41    1.813   0.27( 0.09) 0.32    71.2     187.00
    2      15.21  18.16    1.939   0.30( 0.14) 0.47     9.4     195.00

 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     126.79  18.16    1.939   0.28( 0.09) 0.34    73.1     195.00
    2     130.09  19.89    1.840   0.28( 0.09) 0.34    79.2     191.00
    3     130.32  20.41    1.813   0.28( 0.09) 0.34    80.6     187.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      130.32    Tc(MIN.) =     20.41
 EFFECTIVE AREA(ACRES) =      80.60   AREA-AVERAGED Fm(INCH/HR) =  0.09
 AREA-AVERAGED Fp(INCH/HR) =  0.28  AREA-AVERAGED Ap =  0.34
 TOTAL AREA(ACRES) =       80.6
 LONGEST FLOWPATH FROM NODE    187.00 TO NODE    198.00 =   2909.00 FEET.

 *************************************************************************
  FLOW PROCESS FROM NODE    198.00 TO NODE    199.00 IS CODE =  31
 -------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
 =========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    61.00  DOWNSTREAM(FEET) =    60.00
  FLOW LENGTH(FEET) =   169.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  54.0 INCH PIPE IS 40.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.22
  ESTIMATED PIPE DIAMETER(INCH) =  54.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      130.32
  PIPE TRAVEL TIME(MIN.) =   0.28    Tc(MIN.) =   20.69
  LONGEST FLOWPATH FROM NODE    187.00 TO NODE    199.00 =   3078.00 FEET.

 *************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    201.00 IS CODE =  21
 -------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 =========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =     64.00  DOWNSTREAM(FEET) =    62.00
```

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

```
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.586
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.978
 SUBAREA Tc 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	2.20	0.30	0.500	56	10.99
COMMERCIAL	B	1.40	0.30	0.100	56	8.59

```
   SCHOOL                         B        4.30      0.30      0.600     56    11.64
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.484
   SUBAREA RUNOFF(CFS) =      20.14
   TOTAL AREA(ACRES) =        7.90   PEAK FLOW RATE(CFS) =      20.14
```

```
***************************************************************************
   FLOW PROCESS FROM NODE    201.00 TO NODE    202.00 IS CODE =  62
---------------------------------------------------------------------------
   >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
===========================================================================
   UPSTREAM ELEVATION(FEET) =   62.00  DOWNSTREAM ELEVATION(FEET) =    61.00
   STREET LENGTH(FEET) =    464.00   CURB HEIGHT(INCHES) =  6.0
   STREET HALFWIDTH(FEET) = 20.00

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

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
   STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      28.57
     ***STREET FLOWING FULL***
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) =  0.64
     HALFSTREET FLOOD WIDTH(FEET) =   26.76
     AVERAGE FLOW VELOCITY(FEET/SEC.) =     2.05
     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.30
   STREET FLOW TRAVEL TIME(MIN.) =   3.78   Tc(MIN.) =   12.37
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.416
   SUBAREA LOSS RATE DATA(AMC  II):
    DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
        LAND USE          GROUP   (ACRES)  (INCH/HR) (DECIMAL)  CN
   RESIDENTIAL
   "5-7 DWELLINGS/ACRE"       B      2.70      0.30      0.500     56
   COMMERCIAL                 B      1.70      0.30      0.100     56
   SCHOOL                     B      3.80      0.30      0.600     56
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.463
   SUBAREA AREA(ACRES) =     8.20      SUBAREA RUNOFF(CFS) =   16.80
   EFFECTIVE AREA(ACRES) =     16.10    AREA-AVERAGED Fm(INCH/HR) =  0.14
   AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.47
   TOTAL AREA(ACRES) =        16.1        PEAK FLOW RATE(CFS) =      32.95

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 0.66   HALFSTREET FLOOD WIDTH(FEET) =  28.17
   FLOW VELOCITY(FEET/SEC.) =  2.12   DEPTH*VELOCITY(FT*FT/SEC.) =   1.41
   *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  464.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   17.0 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    202.00
   LONGEST FLOWPATH FROM NODE    200.00 TO NODE    202.00 =    794.00 FEET.

***************************************************************************
   FLOW PROCESS FROM NODE    202.00 TO NODE    203.00 IS CODE =  62
---------------------------------------------------------------------------
   >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =   61.00  DOWNSTREAM ELEVATION(FEET) =   60.00
  STREET LENGTH(FEET) =   647.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      43.89
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.76
    HALFSTREET FLOOD WIDTH(FEET) =   33.23
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.02
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.54
  STREET FLOW TRAVEL TIME(MIN.) =   5.34   Tc(MIN.) =   17.71
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.967
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL    AREA      Fp         Ap     SCS
       LAND USE           GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B       9.50      0.30      0.500     56
  COMMERCIAL                 B       3.60      0.30      0.100     56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.390
  SUBAREA AREA(ACRES) =   13.10      SUBAREA RUNOFF(CFS) =   21.81
  EFFECTIVE AREA(ACRES) =    29.20   AREA-AVERAGED Fm(INCH/HR) =  0.13
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.44
  TOTAL AREA(ACRES) =       29.2       PEAK FLOW RATE(CFS) =      48.25

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.79   HALFSTREET FLOOD WIDTH(FEET) = 34.39
  FLOW VELOCITY(FEET/SEC.) = 2.07   DEPTH*VELOCITY(FT*FT/SEC.) =   1.63
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  647.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   24.3 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    203.00
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    203.00 =    1441.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    204.00 IS CODE =   31
----------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    60.00  DOWNSTREAM(FEET) =    58.00
  FLOW LENGTH(FEET) =   728.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  33.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.92
  ESTIMATED PIPE DIAMETER(INCH) = 42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       48.25
  PIPE TRAVEL TIME(MIN.) =   2.05    Tc(MIN.) =   19.76
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    204.00 =    2169.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    204.00 TO NODE    204.00 IS CODE =  81
--------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   19.76
  *  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
  "5-7 DWELLINGS/ACRE"       B      15.50      0.30      0.500     56
  COMMERCIAL                 B       3.80      0.30      0.100     56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.421
  SUBAREA AREA(ACRES) =   19.30      SUBAREA RUNOFF(CFS) =   29.89
  EFFECTIVE AREA(ACRES) =     48.50   AREA-AVERAGED Fm(INCH/HR) =  0.13
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.43
  TOTAL AREA(ACRES) =       48.5      PEAK FLOW RATE(CFS) =     75.00


****************************************************************************
  FLOW PROCESS FROM NODE    204.00 TO NODE    209.00 IS CODE =  31
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    58.00  DOWNSTREAM(FEET) =    57.00
  FLOW LENGTH(FEET) =   437.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  51.0 INCH PIPE IS  40.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.16
  ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       75.00
  PIPE TRAVEL TIME(MIN.) =   1.18    Tc(MIN.) =   20.94
  LONGEST FLOWPATH FROM NODE    200.00 TO NODE    209.00 =   2606.00 FEET.


****************************************************************************
  FLOW PROCESS FROM NODE    209.00 TO NODE    209.00 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.) =   20.94
  RAINFALL INTENSITY(INCH/HR) =   1.79
  AREA-AVERAGED Fm(INCH/HR) =  0.13
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.43
  EFFECTIVE STREAM AREA(ACRES) =      48.50
  TOTAL STREAM AREA(ACRES) =      48.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      75.00


****************************************************************************
  FLOW PROCESS FROM NODE    205.00 TO NODE    206.00 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =      66.00  DOWNSTREAM(FEET) =      65.00
```

```
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.862
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.751
 SUBAREA Tc 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      4.50     0.30     0.500     56   12.62
 COMMERCIAL                B      2.10     0.30     0.100     56    9.86
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.373
 SUBAREA RUNOFF(CFS) =      15.67
 TOTAL AREA(ACRES) =      6.60   PEAK FLOW RATE(CFS) =      15.67

 **************************************************************************
  FLOW PROCESS FROM NODE    206.00 TO NODE    207.00 IS CODE =  62
 --------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
 ==========================================================================
  UPSTREAM ELEVATION(FEET) =   65.00  DOWNSTREAM ELEVATION(FEET) =   64.00
  STREET LENGTH(FEET) =   487.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      24.87
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.61
    HALFSTREET FLOOD WIDTH(FEET) =   25.73
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.93
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.19
  STREET FLOW TRAVEL TIME(MIN.) =   4.20   Tc(MIN.) =   14.07
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.244
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/     SCS SOIL   AREA      Fp        Ap     SCS
       LAND USE          GROUP    (ACRES)  (INCH/HR) (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"      B      7.50     0.30     0.500     56
  COMMERCIAL                B      2.10     0.30     0.100     56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.412
  SUBAREA AREA(ACRES) =     9.60      SUBAREA RUNOFF(CFS) =   18.32
  EFFECTIVE AREA(ACRES) =     16.20    AREA-AVERAGED Fm(INCH/HR) =  0.12
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =       16.2       PEAK FLOW RATE(CFS) =      30.99

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.66   HALFSTREET FLOOD WIDTH(FEET) = 27.80
  FLOW VELOCITY(FEET/SEC.) =  2.05   DEPTH*VELOCITY(FT*FT/SEC.) =   1.35
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  487.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   19.7 CFS,
```

          WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   207.00
     LONGEST FLOWPATH FROM NODE   205.00 TO NODE   207.00 =   817.00 FEET.

****
  FLOW PROCESS FROM NODE   207.00 TO NODE   208.00 IS CODE = 62

  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 1 USED)<<<<<
==
  UPSTREAM ELEVATION(FEET) =   64.00 DOWNSTREAM ELEVATION(FEET) =   60.00
  STREET LENGTH(FEET) = 1239.00   CURB HEIGHT(INCHES) = 6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   42.51
    STREET FLOWING FULL
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) = 0.67
    HALFSTREET FLOOD WIDTH(FEET) =   28.72
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   2.63
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.78
  STREET FLOW TRAVEL TIME(MIN.) =   7.84   Tc(MIN.) =   21.91
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.741
  SUBAREA LOSS RATE DATA(AMC II):
   DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
       LAND USE   GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"   B   11.60   0.30   0.500   56
  COMMERCIAL   B   4.10   0.30   0.100   56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.396
  SUBAREA AREA(ACRES) =   15.70   SUBAREA RUNOFF(CFS) =   22.93
  EFFECTIVE AREA(ACRES) =   31.90   AREA-AVERAGED Fm(INCH/HR) = 0.12
  AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.40
  TOTAL AREA(ACRES) =   31.9   PEAK FLOW RATE(CFS) =   46.58

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.69   HALFSTREET FLOOD WIDTH(FEET) = 29.63
  FLOW VELOCITY(FEET/SEC.) = 2.71   DEPTH*VELOCITY(FT*FT/SEC.) =   1.88
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L = 1239.0 FT WITH ELEVATION-DROP =   4.0 FT, IS   27.2 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   208.00
  LONGEST FLOWPATH FROM NODE   205.00 TO NODE   208.00 =   2056.00 FEET.

****
  FLOW PROCESS FROM NODE   208.00 TO NODE   209.00 IS CODE = 62

  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 1 USED)<<<<<
==
  UPSTREAM ELEVATION(FEET) =   60.00 DOWNSTREAM ELEVATION(FEET) =   57.00
  STREET LENGTH(FEET) = 1850.00   CURB HEIGHT(INCHES) = 6.0

    STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   57.02
    STREET FLOWING FULL
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) = 0.83
    HALFSTREET FLOOD WIDTH(FEET) =   36.29
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   2.20
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.81
  STREET FLOW TRAVEL TIME(MIN.) = 14.05   Tc(MIN.) =   35.95
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.311
  SUBAREA LOSS RATE DATA(AMC II):
   DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
        LAND USE   GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"   B   5.60   0.30   0.500   56
  COMMERCIAL   B   8.30   0.30   0.100   56
  SCHOOL   B   5.30   0.30   0.600   56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.355
  SUBAREA AREA(ACRES) =   19.20   SUBAREA RUNOFF(CFS) =   20.81
  EFFECTIVE AREA(ACRES) =   51.10   AREA-AVERAGED Fm(INCH/HR) = 0.11
  AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.38
  TOTAL AREA(ACRES) =   51.1   PEAK FLOW RATE(CFS) =   55.04

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.82   HALFSTREET FLOOD WIDTH(FEET) = 35.86
  FLOW VELOCITY(FEET/SEC.) = 2.17   DEPTH*VELOCITY(FT*FT/SEC.) =   1.77
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L = 1850.0 FT WITH ELEVATION-DROP =   3.0 FT, IS   28.0 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   209.00
  LONGEST FLOWPATH FROM NODE   205.00 TO NODE   209.00 =   3906.00 FEET.

  ****
  FLOW PROCESS FROM NODE   209.00 TO NODE   209.00 IS CODE =   1

  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
  ===
  TOTAL NUMBER OF STREAMS = 2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
  TIME OF CONCENTRATION(MIN.) =   35.95
  RAINFALL INTENSITY(INCH/HR) =   1.31
  AREA-AVERAGED Fm(INCH/HR) = 0.11
  AREA-AVERAGED Fp(INCH/HR) = 0.30
  AREA-AVERAGED Ap = 0.38
  EFFECTIVE STREAM AREA(ACRES) =   51.10
  TOTAL STREAM AREA(ACRES) =   51.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   55.04

  ** CONFLUENCE DATA **

```
                                        GC10EX
   STREAM      Q      Tc   Intensity  Fp(Fm)      Ap     Ae    HEADWATER
   NUMBER    (CFS)  (MIN.) (INCH/HR) (INCH/HR)        (ACRES)    NODE
      1      75.00   20.94   1.787  0.30( 0.13) 0.43    48.5    200.00
      2      55.04   35.95   1.311  0.30( 0.11) 0.38    51.1    205.00

   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     119.81   20.94   1.787  0.30( 0.12) 0.41    78.3    200.00
      2     108.51   35.95   1.311  0.30( 0.12) 0.40    99.6    205.00

   COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
   PEAK FLOW RATE(CFS) =     119.81    Tc(MIN.) =    20.94
   EFFECTIVE AREA(ACRES) =      78.26   AREA-AVERAGED Fm(INCH/HR) =  0.12
   AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.41
   TOTAL AREA(ACRES) =       99.6
   LONGEST FLOWPATH FROM NODE    205.00 TO NODE    209.00 =   3906.00 FEET.

***************************************************************************
   FLOW PROCESS FROM NODE    209.00 TO NODE    210.00 IS CODE =  31
---------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===========================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    57.00  DOWNSTREAM(FEET) =    56.50
   FLOW LENGTH(FEET) = 1315.00   MANNING'S N =  0.013
   DEPTH OF FLOW IN  87.0 INCH PIPE IS  66.0 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) =   3.57
   ESTIMATED PIPE DIAMETER(INCH) =  87.00    NUMBER OF PIPES =   1
   PIPE-FLOW(CFS) =      119.81
   PIPE TRAVEL TIME(MIN.) =   6.14    Tc(MIN.) =   27.08
   LONGEST FLOWPATH FROM NODE    205.00 TO NODE    210.00 =   5221.00 FEET.

***************************************************************************
   FLOW PROCESS FROM NODE    210.00 TO NODE    210.00 IS CODE =  81
---------------------------------------------------------------------------
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===========================================================================
   MAINLINE Tc(MIN.) =   27.08
   *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.542
   SUBAREA LOSS RATE DATA(AMC  II):
    DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap    SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR) (DECIMAL)  CN
   RESIDENTIAL
   "5-7 DWELLINGS/ACRE"       B      10.90      0.30     0.500    56
   RESIDENTIAL
   "5-7 DWELLINGS/ACRE"       C       3.00      0.25     0.500    69
   COMMERCIAL                 B       3.50      0.30     0.100    56
   COMMERCIAL                 C       3.50      0.25     0.100    69
   URBAN POOR COVER
   "TURF"                     C       0.30      0.25     1.000    83
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.375
   SUBAREA AREA(ACRES) =  21.20       SUBAREA RUNOFF(CFS) =   27.37
   EFFECTIVE AREA(ACRES) =      99.46   AREA-AVERAGED Fm(INCH/HR) =  0.12
   AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.40
   TOTAL AREA(ACRES) =      120.8       PEAK FLOW RATE(CFS) =     127.29
```

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*************************************************************************
  FLOW PROCESS FROM NODE    210.10 TO NODE    210.20 IS CODE =  21
-------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
=========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =     60.00  DOWNSTREAM(FEET) =     59.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.329
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.541
  SUBAREA Tc 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        1.10     0.30      0.500     56   14.50
  COMMERCIAL                 B        0.50     0.30      0.100     56   11.33
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.375
  SUBAREA RUNOFF(CFS) =      3.50
  TOTAL AREA(ACRES) =      1.60   PEAK FLOW RATE(CFS) =       3.50

*************************************************************************
  FLOW PROCESS FROM NODE    210.20 TO NODE    210.30 IS CODE =  62
-------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
=========================================================================
  UPSTREAM ELEVATION(FEET) =   59.50  DOWNSTREAM ELEVATION(FEET) =   59.00
  STREET LENGTH(FEET) =   538.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.79
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.46
    HALFSTREET FLOOD WIDTH(FEET) =   17.07
    AVERAGE FLOW VELOCITY(FEET/SEC.) =     0.95
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.43
  STREET FLOW TRAVEL TIME(MIN.) =   9.49   Tc(MIN.) =   20.82
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.793
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL    AREA       Fp         Ap     SCS
       LAND USE            GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       B        2.10     0.30      0.500     56
  COMMERCIAL                 B        0.90     0.30      0.100     56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.380
  SUBAREA AREA(ACRES) =    3.00       SUBAREA RUNOFF(CFS) =    4.53
```

  EFFECTIVE AREA(ACRES) =   4.60   AREA-AVERAGED Fm(INCH/HR) = 0.11
  AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.38
  TOTAL AREA(ACRES) =   4.6   PEAK FLOW RATE(CFS) =   6.95

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.48   HALFSTREET FLOOD WIDTH(FEET) = 18.40
  FLOW VELOCITY(FEET/SEC.) = 0.98   DEPTH*VELOCITY(FT*FT/SEC.) =   0.48
  LONGEST FLOWPATH FROM NODE   210.10 TO NODE   210.30 =   868.00 FEET.

  ****
  FLOW PROCESS FROM NODE   210.30 TO NODE   210.40 IS CODE = 62

  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 1 USED)<<<<<
  ==
  UPSTREAM ELEVATION(FEET) =   59.00 DOWNSTREAM ELEVATION(FEET) =   58.00
  STREET LENGTH(FEET) =   325.00   CURB HEIGHT(INCHES) = 6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   9.91
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) = 0.45
    HALFSTREET FLOOD WIDTH(FEET) =   16.68
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   1.69
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   0.76
  STREET FLOW TRAVEL TIME(MIN.) =   3.20   Tc(MIN.) =   24.02
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.652
  SUBAREA LOSS RATE DATA(AMC II):
   DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
       LAND USE   GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"   B   3.30   0.30   0.500   56
  COMMERCIAL   B   1.00   0.30   0.100   56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.407
  SUBAREA AREA(ACRES) =   4.30   SUBAREA RUNOFF(CFS) =   5.92
  EFFECTIVE AREA(ACRES) =   8.90   AREA-AVERAGED Fm(INCH/HR) = 0.12
  AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.39
  TOTAL AREA(ACRES) =   8.9   PEAK FLOW RATE(CFS) =   12.29

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.48   HALFSTREET FLOOD WIDTH(FEET) = 18.16
  FLOW VELOCITY(FEET/SEC.) = 1.78   DEPTH*VELOCITY(FT*FT/SEC.) =   0.85
  LONGEST FLOWPATH FROM NODE   210.10 TO NODE   210.40 =   1193.00 FEET.

  ****
  FLOW PROCESS FROM NODE   210.40 TO NODE   210.50 IS CODE = 62

  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 1 USED)<<<<<
  ==

UPSTREAM ELEVATION(FEET) =   58.00 DOWNSTREAM ELEVATION(FEET) =   57.50
STREET LENGTH(FEET) =   619.00   CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

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

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   16.45
  STREET FLOWING FULL
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) = 0.62
  HALFSTREET FLOOD WIDTH(FEET) =   26.21
  AVERAGE FLOW VELOCITY(FEET/SEC.) =   1.23
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   0.77
STREET FLOW TRAVEL TIME(MIN.) =   8.40 Tc(MIN.) =   32.42
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.391
SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
     LAND USE   GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"5-7 DWELLINGS/ACRE"   B   4.40   0.30   0.500   56
COMMERCIAL   B   2.60   0.30   0.100   56
URBAN POOR COVER
"TURF"   B   0.20   0.30   1.000   74
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.369
SUBAREA AREA(ACRES) =   7.20   SUBAREA RUNOFF(CFS) =   8.30
EFFECTIVE AREA(ACRES) =   16.10   AREA-AVERAGED Fm(INCH/HR) = 0.11
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.38
TOTAL AREA(ACRES) =   16.1   PEAK FLOW RATE(CFS) =   18.49

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.65   HALFSTREET FLOOD WIDTH(FEET) = 27.31
  FLOW VELOCITY(FEET/SEC.) = 1.27   DEPTH*VELOCITY(FT*FT/SEC.) =   0.82
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L = 619.0 FT WITH ELEVATION-DROP =   0.5 FT, IS   12.5 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   210.50
LONGEST FLOWPATH FROM NODE   210.10 TO NODE   210.50 =   1812.00 FEET.

****
  FLOW PROCESS FROM NODE   211.00 TO NODE   212.00 IS CODE =   21

 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
===
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
 ELEVATION DATA: UPSTREAM(FEET) =   67.00 DOWNSTREAM(FEET) =   66.00

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   9.862
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751
 SUBAREA Tc 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"        C       1.60      0.25      0.500     69    12.62
  COMMERCIAL                  C       0.50      0.25      0.100     69     9.86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.405
  SUBAREA RUNOFF(CFS) =      5.01
  TOTAL AREA(ACRES) =       2.10   PEAK FLOW RATE(CFS) =       5.01

***************************************************************************
  FLOW PROCESS FROM NODE   212.00 TO NODE    213.00 IS CODE =  62
---------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
===========================================================================
  UPSTREAM ELEVATION(FEET) =  66.00  DOWNSTREAM ELEVATION(FEET) =   64.00
  STREET LENGTH(FEET) =   523.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.20
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.45
    HALFSTREET FLOOD WIDTH(FEET) =   16.76
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.89
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.86
  STREET FLOW TRAVEL TIME(MIN.) =   4.60   Tc(MIN.) =   14.46
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.209
  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"       C       4.80      0.25      0.500     69
  COMMERCIAL                 C       1.60      0.25      0.100     69
  URBAN POOR COVER
  "TURF"                     C       0.10      0.25      1.000     83
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.409
  SUBAREA AREA(ACRES) =    6.50      SUBAREA RUNOFF(CFS) =   12.32
  EFFECTIVE AREA(ACRES) =       8.60    AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.41
  TOTAL AREA(ACRES) =       8.6         PEAK FLOW RATE(CFS) =      16.31

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.51   HALFSTREET FLOOD WIDTH(FEET) =  19.80
  FLOW VELOCITY(FEET/SEC.) =  2.07   DEPTH*VELOCITY(FT*FT/SEC.) =   1.05
  LONGEST FLOWPATH FROM NODE    211.00 TO NODE    213.00 =    853.00 FEET.

***************************************************************************
  FLOW PROCESS FROM NODE    213.00 TO NODE    214.00 IS CODE =  62
---------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
```

```
================================================================================
  UPSTREAM ELEVATION(FEET) =   64.00  DOWNSTREAM ELEVATION(FEET) =    60.00
  STREET LENGTH(FEET) = 1186.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      27.79
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.59
    HALFSTREET FLOOD WIDTH(FEET) =   24.57
    AVERAGE FLOW VELOCITY(FEET/SEC.) =     2.37
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.40
  STREET FLOW TRAVEL TIME(MIN.) =   8.33   Tc(MIN.) =   22.80
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.702
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL    AREA       Fp        Ap     SCS
       LAND USE           GROUP    (ACRES)  (INCH/HR) (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       C       11.50      0.25     0.500    69
  COMMERCIAL                 C        4.20      0.25     0.100    69
  URBAN POOR COVER
  "TURF"                     C        0.10      0.25     1.000    83
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.397
  SUBAREA AREA(ACRES) =   15.80      SUBAREA RUNOFF(CFS) =   22.79
  EFFECTIVE AREA(ACRES) =     24.40    AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =       24.4        PEAK FLOW RATE(CFS) =     35.17

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.63   HALFSTREET FLOOD WIDTH(FEET) =  26.64
  FLOW VELOCITY(FEET/SEC.) =  2.54   DEPTH*VELOCITY(FT*FT/SEC.) =   1.61
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1186.0 FT WITH ELEVATION-DROP =   4.0 FT, IS   28.1 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    214.00
  LONGEST FLOWPATH FROM NODE    211.00 TO NODE    214.00 =    2039.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    214.00 TO NODE    214.00 IS CODE =    1
-------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   22.80
  RAINFALL INTENSITY(INCH/HR) =  1.70
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25
  AREA-AVERAGED Ap =  0.40
  EFFECTIVE STREAM AREA(ACRES) =      24.40
  TOTAL STREAM AREA(ACRES) =      24.40
```

PEAK FLOW RATE(CFS) AT CONFLUENCE =   35.17

```
****************************************************************************
  FLOW PROCESS FROM NODE   215.00 TO NODE    216.00 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =     68.00  DOWNSTREAM(FEET) =     66.00
```

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   8.586
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.978
  SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	C	0.20	0.25	0.500	69	10.99
COMMERCIAL	C	1.50	0.25	0.100	69	8.59

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.147
  SUBAREA RUNOFF(CFS) =      4.50
  TOTAL AREA(ACRES) =      1.70   PEAK FLOW RATE(CFS) =      4.50

****************************************************************************
  FLOW PROCESS FROM NODE   216.00 TO NODE    217.00 IS CODE =  62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =   66.00  DOWNSTREAM ELEVATION(FEET) =   62.00
  STREET LENGTH(FEET) =   970.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.04
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.41
    HALFSTREET FLOOD WIDTH(FEET) =   14.49
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.79
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.73
  STREET FLOW TRAVEL TIME(MIN.) =   9.04   Tc(MIN.) =   17.63
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.972
  SUBAREA LOSS RATE DATA(AMC  II):
```

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
COMMERCIAL	C	3.80	0.25	0.100	69
URBAN POOR COVER					
"TURF"	C	0.20	0.25	1.000	83

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.145
```

```
 SUBAREA AREA(ACRES) =    4.00      SUBAREA RUNOFF(CFS) =    6.97
 EFFECTIVE AREA(ACRES) =      5.70    AREA-AVERAGED Fm(INCH/HR) =  0.04
 AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.15
 TOTAL AREA(ACRES) =          5.7        PEAK FLOW RATE(CFS) =       9.93

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.43   HALFSTREET FLOOD WIDTH(FEET) =  15.74
 FLOW VELOCITY(FEET/SEC.) =  1.89   DEPTH*VELOCITY(FT*FT/SEC.) =   0.82
 LONGEST FLOWPATH FROM NODE    215.00 TO NODE    217.00 =    1300.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    217.00 TO NODE    214.00 IS CODE =  31
-------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =     62.00  DOWNSTREAM(FEET) =     60.00
 FLOW LENGTH(FEET) = 1132.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  18.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.45
 ESTIMATED PIPE DIAMETER(INCH) = 27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =        9.93
 PIPE TRAVEL TIME(MIN.) =   5.46    Tc(MIN.) =   23.09
 LONGEST FLOWPATH FROM NODE    215.00 TO NODE    214.00 =    2432.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    214.00 TO NODE    214.00 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.) =   23.09
 RAINFALL INTENSITY(INCH/HR) =   1.69
 AREA-AVERAGED Fm(INCH/HR) =  0.04
 AREA-AVERAGED Fp(INCH/HR) =  0.25
 AREA-AVERAGED Ap =  0.15
 EFFECTIVE STREAM AREA(ACRES) =        5.70
 TOTAL STREAM AREA(ACRES) =       5.70
 PEAK FLOW RATE(CFS) AT CONFLUENCE =        9.93

 ** CONFLUENCE DATA **
  STREAM      Q      Tc   Intensity  Fp(Fm)      Ap      Ae     HEADWATER
  NUMBER    (CFS) (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1      35.17  22.80   1.702  0.25( 0.10) 0.40      24.4     211.00
     2       9.93  23.09   1.689  0.25( 0.04) 0.15       5.7     215.00

 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      45.05  22.80   1.702  0.25( 0.09) 0.35      30.0     211.00
     2      44.83  23.09   1.689  0.25( 0.09) 0.35      30.1     215.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       45.05    Tc(MIN.) =    22.80
 EFFECTIVE AREA(ACRES) =       30.03   AREA-AVERAGED Fm(INCH/HR) =  0.09
```

```
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        30.1
  LONGEST FLOWPATH FROM NODE    215.00 TO NODE    214.00 =    2432.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    214.00 TO NODE    222.00 IS CODE =  31
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     60.00  DOWNSTREAM(FEET) =    58.00
  FLOW LENGTH(FEET) = 1041.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  33.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.15
  ESTIMATED PIPE DIAMETER(INCH) = 45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       45.05
  PIPE TRAVEL TIME(MIN.) =   3.37    Tc(MIN.) =   26.17
  LONGEST FLOWPATH FROM NODE    215.00 TO NODE    222.00 =    3473.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    222.00 TO NODE    222.00 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.) =   26.17
  RAINFALL INTENSITY(INCH/HR) =    1.57
  AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.25
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       30.03
  TOTAL STREAM AREA(ACRES) =       30.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       45.05

**************************************************************************
  FLOW PROCESS FROM NODE    218.00 TO NODE    219.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    330.00
  ELEVATION DATA: UPSTREAM(FEET) =     62.00  DOWNSTREAM(FEET) =     61.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.862
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.751
  SUBAREA Tc 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"      C       1.10     0.25     0.500    69  12.62
   COMMERCIAL                C       0.70     0.25     0.100    69   9.86
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.344
   SUBAREA RUNOFF(CFS) =      4.32
   TOTAL AREA(ACRES) =      1.80   PEAK FLOW RATE(CFS) =       4.32

**************************************************************************
  FLOW PROCESS FROM NODE    219.00 TO NODE    220.00 IS CODE =  62
```

```
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
```
==
```
  UPSTREAM ELEVATION(FEET) =   61.00  DOWNSTREAM ELEVATION(FEET) =   60.00
  STREET LENGTH(FEET) =   301.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 42.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  21.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.80
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.45
    HALFSTREET FLOOD WIDTH(FEET) =   14.73
    AVERAGE FLOW VELOCITY(FEET/SEC.) =     1.65
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.75
  STREET FLOW TRAVEL TIME(MIN.) =   3.04   Tc(MIN.) =   12.90
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.359
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL    AREA       Fp         Ap     SCS
       LAND USE            GROUP    (ACRES)  (INCH/HR) (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       C        2.20      0.25      0.500     69
  COMMERCIAL                 C        1.20      0.25      0.100     69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.359
  SUBAREA AREA(ACRES) =    3.40       SUBAREA RUNOFF(CFS) =    6.94
  EFFECTIVE AREA(ACRES) =      5.20    AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        5.2         PEAK FLOW RATE(CFS) =      10.62

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.49   HALFSTREET FLOOD WIDTH(FEET) =  16.73
  FLOW VELOCITY(FEET/SEC.) =  1.78   DEPTH*VELOCITY(FT*FT/SEC.) =   0.88
  LONGEST FLOWPATH FROM NODE    218.00 TO NODE    220.00 =     631.00 FEET.
```

****
```
  FLOW PROCESS FROM NODE    220.00 TO NODE    221.00 IS CODE =  62
```

```
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
```
==
```
  UPSTREAM ELEVATION(FEET) =   60.00  DOWNSTREAM ELEVATION(FEET) =   59.00
  STREET LENGTH(FEET) =   680.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 42.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  21.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
```

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

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   15.10
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.61
   HALFSTREET FLOOD WIDTH(FEET) =   22.68
   AVERAGE FLOW VELOCITY(FEET/SEC.) =   1.42
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   0.87
STREET FLOW TRAVEL TIME(MIN.) =   8.01   Tc(MIN.) =   20.90
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.789
SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
     LAND USE   GROUP   (ACRES) (INCH/HR) (DECIMAL)   CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"   C   3.30   0.25   0.500   69
 COMMERCIAL   C   2.50   0.25   0.100   69
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.328
 SUBAREA AREA(ACRES) =   5.80   SUBAREA RUNOFF(CFS) =   8.91
 EFFECTIVE AREA(ACRES) =   11.00   AREA-AVERAGED Fm(INCH/HR) = 0.09
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.34
 TOTAL AREA(ACRES) =   11.0   PEAK FLOW RATE(CFS) =   16.86

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.63   HALFSTREET FLOOD WIDTH(FEET) = 23.67
 FLOW VELOCITY(FEET/SEC.) = 1.46   DEPTH*VELOCITY(FT*FT/SEC.) =   0.92
 LONGEST FLOWPATH FROM NODE   218.00 TO NODE   221.00 =   1311.00 FEET.

****
  FLOW PROCESS FROM NODE   221.00 TO NODE   222.00 IS CODE = 62

  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 2 USED)<<<<<
==
  UPSTREAM ELEVATION(FEET) =   59.00 DOWNSTREAM ELEVATION(FEET) =   58.00
  STREET LENGTH(FEET) =   915.00   CURB HEIGHT(INCHES) = 8.0
  STREET HALFWIDTH(FEET) = 42.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   29.20
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.78
   HALFSTREET FLOOD WIDTH(FEET) =   36.35
   AVERAGE FLOW VELOCITY(FEET/SEC.) =   1.46
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.13
STREET FLOW TRAVEL TIME(MIN.) = 10.47   Tc(MIN.) =   31.38
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.417
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"   C   15.20   0.25   0.500   69

```
  COMMERCIAL                       C        5.50       0.25      0.100     69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.394
  SUBAREA AREA(ACRES) =   20.70      SUBAREA RUNOFF(CFS) =   24.57
  EFFECTIVE AREA(ACRES) =     31.70    AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.38
  TOTAL AREA(ACRES) =         31.7        PEAK FLOW RATE(CFS) =       37.76

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.84   HALFSTREET FLOOD WIDTH(FEET) = 42.42
  FLOW VELOCITY(FEET/SEC.) = 1.52   DEPTH*VELOCITY(FT*FT/SEC.) =   1.27
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 915.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   34.3 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    222.00
  LONGEST FLOWPATH FROM NODE    218.00 TO NODE    222.00 =   2226.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE    222.00 TO NODE    222.00 IS CODE =   1
-----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
=============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   31.38
  RAINFALL INTENSITY(INCH/HR) =    1.42
  AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.25
  AREA-AVERAGED Ap =  0.38
  EFFECTIVE STREAM AREA(ACRES) =      31.70
  TOTAL STREAM AREA(ACRES) =      31.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      37.76

  ** CONFLUENCE DATA **
  STREAM       Q      Tc    Intensity  Fp(Fm)      Ap      Ae      HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)     NODE
    1        45.05   26.17    1.573  0.25( 0.09) 0.35     30.0     211.00
    1        44.83   26.46    1.563  0.25( 0.09) 0.35     30.1     215.00
    2        37.76   31.38    1.417  0.25( 0.09) 0.38     31.7     218.00

  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        80.23   26.17    1.573  0.25( 0.09) 0.36     56.5     211.00
    2        80.17   26.46    1.563  0.25( 0.09) 0.36     56.8     215.00
    3        78.17   31.38    1.417  0.25( 0.09) 0.36     61.8     218.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       80.23    Tc(MIN.) =    26.17
  EFFECTIVE AREA(ACRES) =      56.46   AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.36
  TOTAL AREA(ACRES) =       61.8
  LONGEST FLOWPATH FROM NODE    215.00 TO NODE    222.00 =   3473.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE    222.00 TO NODE    227.00 IS CODE =  31
-----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    58.00  DOWNSTREAM(FEET) =    57.00
  FLOW LENGTH(FEET) =   411.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  54.0 INCH PIPE IS  39.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.52
  ESTIMATED PIPE DIAMETER(INCH) =  54.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       80.23
  PIPE TRAVEL TIME(MIN.) =   1.05    Tc(MIN.) =   27.22
  LONGEST FLOWPATH FROM NODE    215.00 TO NODE    227.00 =    3884.00 FEET.


**************************************************************************
  FLOW PROCESS FROM NODE    227.00 TO NODE    227.00 IS CODE =    1
--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   27.22
  RAINFALL INTENSITY(INCH/HR) =   1.54
  AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.25
  AREA-AVERAGED Ap =  0.36
  EFFECTIVE STREAM AREA(ACRES) =      56.46
  TOTAL STREAM AREA(ACRES) =      61.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      80.23


**************************************************************************
  FLOW PROCESS FROM NODE    223.00 TO NODE    224.00 IS CODE =   21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =     63.00  DOWNSTREAM(FEET) =     62.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   9.862
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.751
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
```

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL "5-7 DWELLINGS/ACRE"	B	0.50	0.30	0.500	56	12.62
RESIDENTIAL "5-7 DWELLINGS/ACRE"	C	1.60	0.25	0.500	69	12.62
COMMERCIAL	B	0.20	0.30	0.100	56	9.86
COMMERCIAL	C	0.70	0.25	0.100	69	9.86

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.26
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.380
  SUBAREA RUNOFF(CFS) =       7.16
  TOTAL AREA(ACRES) =       3.00   PEAK FLOW RATE(CFS) =       7.16


**************************************************************************
  FLOW PROCESS FROM NODE    224.00 TO NODE    225.00 IS CODE =   62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
```

```
 UPSTREAM ELEVATION(FEET) =   62.00  DOWNSTREAM ELEVATION(FEET) =    59.00
 STREET LENGTH(FEET) =   749.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 20.00

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.62
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.44
   HALFSTREET FLOOD WIDTH(FEET) =   16.29
   AVERAGE FLOW VELOCITY(FEET/SEC.) =     1.89
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =     0.84
 STREET FLOW TRAVEL TIME(MIN.) =   6.59   Tc(MIN.) =   16.45
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.052
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL    AREA       Fp         Ap    SCS
      LAND USE           GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"        C       2.70      0.25      0.500     69
 COMMERCIAL                  C       1.20      0.25      0.100     69
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.377
 SUBAREA AREA(ACRES) =    3.90       SUBAREA RUNOFF(CFS) =    6.87
 EFFECTIVE AREA(ACRES) =      6.90    AREA-AVERAGED Fm(INCH/HR) =  0.10
 AREA-AVERAGED Fp(INCH/HR) =  0.26  AREA-AVERAGED Ap =  0.38
 TOTAL AREA(ACRES) =       6.9        PEAK FLOW RATE(CFS) =      12.14

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.46   HALFSTREET FLOOD WIDTH(FEET) = 17.15
 FLOW VELOCITY(FEET/SEC.) = 1.97   DEPTH*VELOCITY(FT*FT/SEC.) =   0.90
 LONGEST FLOWPATH FROM NODE    223.00 TO NODE    225.00 =    1079.00 FEET.

 **************************************************************************
  FLOW PROCESS FROM NODE    225.00 TO NODE    226.00 IS CODE =  62
 -------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
 =========================================================================
  UPSTREAM ELEVATION(FEET) =   59.00  DOWNSTREAM ELEVATION(FEET) =    58.00
  STREET LENGTH(FEET) =   381.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.95
   ***STREET FLOWING FULL***
```

```
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.55
  HALFSTREET FLOOD WIDTH(FEET) =   22.61
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.92
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.06
STREET FLOW TRAVEL TIME(MIN.) =   3.31   Tc(MIN.) =   19.76
*  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
"5-7 DWELLINGS/ACRE"      B       3.10     0.30     0.500    56
RESIDENTIAL
"5-7 DWELLINGS/ACRE"      C       3.50     0.25     0.500    69
COMMERCIAL               B        0.70     0.30     0.100    56
COMMERCIAL               C        1.40     0.25     0.100    69
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.403
SUBAREA AREA(ACRES) =    8.70      SUBAREA RUNOFF(CFS) =   13.60
EFFECTIVE AREA(ACRES) =    15.60    AREA-AVERAGED Fm(INCH/HR) =  0.10
AREA-AVERAGED Fp(INCH/HR) =  0.27  AREA-AVERAGED Ap =  0.39
TOTAL AREA(ACRES) =       15.6        PEAK FLOW RATE(CFS) =      24.47

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.59   HALFSTREET FLOOD WIDTH(FEET) = 24.57
FLOW VELOCITY(FEET/SEC.) = 2.09   DEPTH*VELOCITY(FT*FT/SEC.) =   1.24
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L =  381.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   19.6 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    226.00
LONGEST FLOWPATH FROM NODE    223.00 TO NODE    226.00 =   1460.00 FEET.

***************************************************************************
  FLOW PROCESS FROM NODE    226.00 TO NODE    227.00 IS CODE =  62
--------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
==========================================================================
  UPSTREAM ELEVATION(FEET) =   58.00  DOWNSTREAM ELEVATION(FEET) =   57.00
  STREET LENGTH(FEET) =   714.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      37.15
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.74
    HALFSTREET FLOOD WIDTH(FEET) =   31.77
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.87
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.38
  STREET FLOW TRAVEL TIME(MIN.) =   6.35   Tc(MIN.) =   26.11
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.575
  SUBAREA LOSS RATE DATA(AMC  II):
```

```
                                GC10EX
  DEVELOPMENT TYPE/       SCS SOIL    AREA      Fp        Ap      SCS
      LAND USE            GROUP     (ACRES)  (INCH/HR)  (DECIMAL)  CN
RESIDENTIAL
"5-7 DWELLINGS/ACRE"         B        4.80     0.30      0.500     56
RESIDENTIAL
"5-7 DWELLINGS/ACRE"         C       10.90     0.25      0.500     69
COMMERCIAL                   B        1.50     0.30      0.100     56
COMMERCIAL                   C        1.10     0.25      0.100     69
URBAN POOR COVER
"TURF"                       B        0.50     0.30      1.000     74
URBAN POOR COVER
"TURF"                       C        0.60     0.25      1.000     83
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.475
SUBAREA AREA(ACRES) =   19.40     SUBAREA RUNOFF(CFS) =    25.28
EFFECTIVE AREA(ACRES) =      35.00    AREA-AVERAGED Fm(INCH/HR) =  0.12
AREA-AVERAGED Fp(INCH/HR) =  0.27  AREA-AVERAGED Ap =  0.44
TOTAL AREA(ACRES) =       35.0       PEAK FLOW RATE(CFS) =      45.93

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.79   HALFSTREET FLOOD WIDTH(FEET) =  34.39
FLOW VELOCITY(FEET/SEC.) =  1.97   DEPTH*VELOCITY(FT*FT/SEC.) =   1.55
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
      AND L =  714.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   34.6 CFS,
      WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    227.00
LONGEST FLOWPATH FROM NODE    223.00 TO NODE    227.00 =   2174.00 FEET.

***************************************************************************
  FLOW PROCESS FROM NODE    227.00 TO NODE    227.00 IS CODE =    1
---------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
===========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   26.11
  RAINFALL INTENSITY(INCH/HR) =   1.57
  AREA-AVERAGED Fm(INCH/HR) =  0.12
  AREA-AVERAGED Fp(INCH/HR) =  0.27
  AREA-AVERAGED Ap =  0.44
  EFFECTIVE STREAM AREA(ACRES) =      35.00
  TOTAL STREAM AREA(ACRES) =      35.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      45.93

  ** CONFLUENCE DATA **
  STREAM      Q     Tc   Intensity  Fp(Fm)      Ap      Ae     HEADWATER
  NUMBER    (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1      80.23  27.22   1.538   0.25( 0.09) 0.36     56.5    211.00
     1      80.17  27.51   1.528   0.25( 0.09) 0.36     56.8    215.00
     1      78.17  32.46   1.390   0.25( 0.09) 0.36     61.8    218.00
     2      45.93  26.11   1.575   0.27( 0.12) 0.44     35.0    223.00

  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     124.87  26.11   1.575   0.26( 0.10) 0.39     89.2    223.00
     2     124.99  27.22   1.538   0.26( 0.10) 0.39     91.5    211.00
```

       3   124.63   27.51   1.528 0.26(0.10) 0.39   91.8   215.00
       4   118.28   32.46   1.390 0.26(0.10) 0.39   96.8   218.00

   COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
   PEAK FLOW RATE(CFS) =   124.99   Tc(MIN.) =   27.22
   EFFECTIVE AREA(ACRES) =   91.46   AREA-AVERAGED Fm(INCH/HR) = 0.10
   AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.39
   TOTAL AREA(ACRES) =   96.8
   LONGEST FLOWPATH FROM NODE   215.00 TO NODE   227.00 =   3884.00 FEET.

****
   FLOW PROCESS FROM NODE   228.00 TO NODE   229.00 IS CODE = 21

   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
   >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
   ELEVATION DATA: UPSTREAM(FEET) =   56.00 DOWNSTREAM(FEET) =   54.00

   Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
   SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   8.586
   * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.978
   SUBAREA Tc 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   1.80   0.30   0.500   56   10.99
   COMMERCIAL   B   0.70   0.30   0.100   56   8.59
   SCHOOL   B   2.20   0.30   0.600   56   11.64
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.487
   SUBAREA RUNOFF(CFS) =   11.98
   TOTAL AREA(ACRES) =   4.70   PEAK FLOW RATE(CFS) =   11.98

****
   FLOW PROCESS FROM NODE   229.00 TO NODE   230.00 IS CODE = 62

   >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>(STREET TABLE SECTION # 1 USED)<<<<<
==
   UPSTREAM ELEVATION(FEET) =   54.00 DOWNSTREAM ELEVATION(FEET) =   53.00
   STREET LENGTH(FEET) =   580.00   CURB HEIGHT(INCHES) = 6.0
   STREET HALFWIDTH(FEET) = 20.00

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

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
   STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   18.29
     STREET FLOWING FULL
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) = 0.58
     HALFSTREET FLOOD WIDTH(FEET) =   23.89
     AVERAGE FLOW VELOCITY(FEET/SEC.) =   1.65
     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   0.96

```
  STREET FLOW TRAVEL TIME(MIN.) =   5.85   Tc(MIN.) =   14.43
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.211
  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       2.80     0.30     0.500     56
  COMMERCIAL                 B       1.40     0.30     0.100     56
  SCHOOL                     B       1.90     0.30     0.600     56
  SCHOOL                     C       0.60     0.25     0.600     69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.29
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.454
  SUBAREA AREA(ACRES) =    6.70      SUBAREA RUNOFF(CFS) =   12.53
  EFFECTIVE AREA(ACRES) =     11.40    AREA-AVERAGED Fm(INCH/HR) =  0.14
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.47
  TOTAL AREA(ACRES) =        11.4       PEAK FLOW RATE(CFS) =      21.27


  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.60   HALFSTREET FLOOD WIDTH(FEET) =  25.18
  FLOW VELOCITY(FEET/SEC.) =  1.73   DEPTH*VELOCITY(FT*FT/SEC.) =   1.04
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  580.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   12.9 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    230.00
  LONGEST FLOWPATH FROM NODE    228.00 TO NODE    230.00 =    910.00 FEET.

  **************************************************************************
  FLOW PROCESS FROM NODE    230.00 TO NODE    234.00 IS CODE =  31
  --------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
  ==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    53.00  DOWNSTREAM(FEET) =    52.50
  FLOW LENGTH(FEET) = 1212.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  33.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.39
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       21.27
  PIPE TRAVEL TIME(MIN.) =   8.45    Tc(MIN.) =   22.88
  LONGEST FLOWPATH FROM NODE    228.00 TO NODE    234.00 =   2122.00 FEET.

  **************************************************************************
  FLOW PROCESS FROM NODE    234.00 TO NODE    234.00 IS CODE =   1
  --------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  ==========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   22.88
  RAINFALL INTENSITY(INCH/HR) =   1.70
  AREA-AVERAGED Fm(INCH/HR) =  0.14
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.47
  EFFECTIVE STREAM AREA(ACRES) =      11.40
  TOTAL STREAM AREA(ACRES) =      11.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      21.27

  **************************************************************************
  FLOW PROCESS FROM NODE    231.00 TO NODE    232.00 IS CODE =  21
  --------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
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                                    GC10EX
    >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
    INITIAL SUBAREA FLOW-LENGTH(FEET) =    330.00
    ELEVATION DATA: UPSTREAM(FEET) =      56.00  DOWNSTREAM(FEET) =     54.00


    Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
    SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.586
    *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.978
    SUBAREA Tc AND LOSS RATE DATA(AMC  II):
     DEVELOPMENT TYPE/      SCS SOIL    AREA      Fp         Ap      SCS    Tc
         LAND USE           GROUP    (ACRES)  (INCH/HR) (DECIMAL)  CN   (MIN.)
    URBAN POOR COVER
    "TURF"                     C       0.30      0.25     1.000     83   14.83
    COMMERCIAL                 C       0.60      0.25     0.100     69    8.59
    SCHOOL                     B       1.80      0.30     0.600     56   11.64
    SCHOOL                     C       5.30      0.25     0.600     69   11.64
    SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.26
    SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.578
    SUBAREA RUNOFF(CFS) =     20.35
    TOTAL AREA(ACRES) =      8.00   PEAK FLOW RATE(CFS) =     20.35


****************************************************************************
    FLOW PROCESS FROM NODE    232.00 TO NODE    233.00 IS CODE =  62
--------------------------------------------------------------------------------
    >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
    >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
    UPSTREAM ELEVATION(FEET) =   54.00  DOWNSTREAM ELEVATION(FEET) =   53.00
    STREET LENGTH(FEET) =   345.00   CURB HEIGHT(INCHES) =  6.0
    STREET HALFWIDTH(FEET) = 20.00

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

    SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
    STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
    Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
    Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

      **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      29.53
      ***STREET FLOWING FULL***
      STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
      STREET FLOW DEPTH(FEET) =  0.61
      HALFSTREET FLOOD WIDTH(FEET) =   25.73
      AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.29
      PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.41
    STREET FLOW TRAVEL TIME(MIN.) =   2.51   Tc(MIN.) =   11.09
    *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.571
    SUBAREA LOSS RATE DATA(AMC  II):
     DEVELOPMENT TYPE/      SCS SOIL    AREA      Fp         Ap      SCS
         LAND USE           GROUP    (ACRES)  (INCH/HR) (DECIMAL)  CN
    URBAN POOR COVER
    "TURF"                     C       0.30      0.25     1.000     83
    COMMERCIAL                 C       0.60      0.25     0.100     69
    SCHOOL                     B       0.50      0.30     0.600     56
    SCHOOL                     C       7.00      0.25     0.600     69
    SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
    SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.579
    SUBAREA AREA(ACRES) =     8.40      SUBAREA RUNOFF(CFS) =   18.33
                                      99
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   EFFECTIVE AREA(ACRES) =      16.40    AREA-AVERAGED Fm(INCH/HR) =  0.15
   AREA-AVERAGED Fp(INCH/HR) =  0.26  AREA-AVERAGED Ap =  0.58
   TOTAL AREA(ACRES) =        16.4        PEAK FLOW RATE(CFS) =      35.76

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 0.65   HALFSTREET FLOOD WIDTH(FEET) =  27.50
   FLOW VELOCITY(FEET/SEC.) =  2.42   DEPTH*VELOCITY(FT*FT/SEC.) =   1.57
   *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
          AND L =  345.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   19.4 CFS,
          WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    233.00
   LONGEST FLOWPATH FROM NODE     231.00 TO NODE    233.00 =    675.00 FEET.

***************************************************************************
   FLOW PROCESS FROM NODE    233.00 TO NODE    234.00 IS CODE =  62
---------------------------------------------------------------------------
   >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
===========================================================================
   UPSTREAM ELEVATION(FEET) =   53.00  DOWNSTREAM ELEVATION(FEET) =    52.50
   STREET LENGTH(FEET) =   375.00   CURB HEIGHT(INCHES) =  6.0
   STREET HALFWIDTH(FEET) = 20.00

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

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
   STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      49.62
     ***STREET FLOWING FULL***
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) =  0.81
     HALFSTREET FLOOD WIDTH(FEET) =   35.74
     AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.97
     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.60
   STREET FLOW TRAVEL TIME(MIN.) =   3.17   Tc(MIN.) =   14.27
   *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.226
   SUBAREA LOSS RATE DATA(AMC  II):
    DEVELOPMENT TYPE/       SCS SOIL   AREA       Fp          Ap     SCS
        LAND USE            GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
   URBAN POOR COVER
   "TURF"                     C       0.40      0.25      1.000     83
   COMMERCIAL                 C       0.90      0.25      0.100     69
   SCHOOL                     B       1.60      0.30      0.600     56
   SCHOOL                     C      11.90      0.25      0.600     69
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.26
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.580
   SUBAREA AREA(ACRES) =   14.80     SUBAREA RUNOFF(CFS) =   27.68
   EFFECTIVE AREA(ACRES) =      31.20    AREA-AVERAGED Fm(INCH/HR) =  0.15
   AREA-AVERAGED Fp(INCH/HR) =  0.26  AREA-AVERAGED Ap =  0.58
   TOTAL AREA(ACRES) =        31.2        PEAK FLOW RATE(CFS) =      58.34

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 0.86   HALFSTREET FLOOD WIDTH(FEET) =  37.99
   FLOW VELOCITY(FEET/SEC.) =  2.05   DEPTH*VELOCITY(FT*FT/SEC.) =   1.76
   *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
          AND L =  375.0 FT WITH ELEVATION-DROP =   0.5 FT, IS   30.4 CFS,
```

         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   234.00
    LONGEST FLOWPATH FROM NODE   231.00 TO NODE   234.00 =   1050.00 FEET.

****
  FLOW PROCESS FROM NODE   234.00 TO NODE   234.00 IS CODE =   1

  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==
  TOTAL NUMBER OF STREAMS = 2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.27
  RAINFALL INTENSITY(INCH/HR) =   2.23
  AREA-AVERAGED Fm(INCH/HR) = 0.15
  AREA-AVERAGED Fp(INCH/HR) = 0.26
  AREA-AVERAGED Ap = 0.58
  EFFECTIVE STREAM AREA(ACRES) =   31.20
  TOTAL STREAM AREA(ACRES) =   31.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   58.34

  ** CONFLUENCE DATA **
  STREAM   Q   Tc   Intensity   Fp(Fm)   Ap   Ae   HEADWATER
  NUMBER   (CFS) (MIN.) (INCH/HR) (INCH/HR)   (ACRES)   NODE
     1   21.27   22.88   1.698   0.30(0.14) 0.47   11.4   228.00
     2   58.34   14.27   2.226   0.26(0.15) 0.58   31.2   231.00

  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   76.09   14.27   2.226   0.26(0.15) 0.56   38.3   231.00
     2   64.79   22.88   1.698   0.27(0.15) 0.55   42.6   228.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   76.09   Tc(MIN.) =   14.27
  EFFECTIVE AREA(ACRES) =   38.31   AREA-AVERAGED Fm(INCH/HR) = 0.15
  AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.56
  TOTAL AREA(ACRES) =   42.6
  LONGEST FLOWPATH FROM NODE   228.00 TO NODE   234.00 =   2122.00 FEET.

****
  FLOW PROCESS FROM NODE   234.00 TO NODE   235.00 IS CODE =   31

  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==
  ELEVATION DATA: UPSTREAM(FEET) =   52.50 DOWNSTREAM(FEET) =   52.00
  FLOW LENGTH(FEET) =   66.00   MANNING'S N = 0.013
  DEPTH OF FLOW IN 42.0 INCH PIPE IS 31.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.79
  ESTIMATED PIPE DIAMETER(INCH) = 42.00   NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =   76.09
  PIPE TRAVEL TIME(MIN.) =   0.11   Tc(MIN.) =   14.38
  LONGEST FLOWPATH FROM NODE   228.00 TO NODE   235.00 =   2188.00 FEET.

****
  FLOW PROCESS FROM NODE   236.00 TO NODE   237.00 IS CODE =   21

```
                                GC10EX
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =     58.00  DOWNSTREAM(FEET) =     57.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.862
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.751
  SUBAREA Tc 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"       C       2.80      0.25      0.500     69   12.62
  COMMERCIAL                 C       0.60      0.25      0.100     69    9.86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.429
  SUBAREA RUNOFF(CFS) =      8.09
  TOTAL AREA(ACRES) =      3.40   PEAK FLOW RATE(CFS) =      8.09

****************************************************************************
  FLOW PROCESS FROM NODE    237.00 TO NODE    238.00 IS CODE =  62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =   57.00  DOWNSTREAM ELEVATION(FEET) =   55.00
  STREET LENGTH(FEET) =   436.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.85
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.46
    HALFSTREET FLOOD WIDTH(FEET) =   17.07
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.10
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.96
  STREET FLOW TRAVEL TIME(MIN.) =   3.46   Tc(MIN.) =   13.33
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.315
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL    AREA      Fp        Ap      SCS
       LAND USE            GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       C       2.00      0.25      0.500     69
  COMMERCIAL                 C       2.70      0.25      0.100     69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.270
  SUBAREA AREA(ACRES) =    4.70      SUBAREA RUNOFF(CFS) =    9.51
  EFFECTIVE AREA(ACRES) =      8.10    AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.34
  TOTAL AREA(ACRES) =        8.1        PEAK FLOW RATE(CFS) =      16.26
```

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  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.49   HALFSTREET FLOOD WIDTH(FEET) =  18.79
  FLOW VELOCITY(FEET/SEC.) =  2.21   DEPTH*VELOCITY(FT*FT/SEC.) =   1.09
  LONGEST FLOWPATH FROM NODE    236.00 TO NODE    238.00 =    766.00 FEET.

  *************************************************************************
  FLOW PROCESS FROM NODE    238.00 TO NODE    239.00 IS CODE =  62
  -----------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
  =======================================================================
  UPSTREAM ELEVATION(FEET) =   55.00  DOWNSTREAM ELEVATION(FEET) =   52.00
  STREET LENGTH(FEET) =   915.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      21.68
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.56
    HALFSTREET FLOOD WIDTH(FEET) =   22.80
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.16
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.20
  STREET FLOW TRAVEL TIME(MIN.) =   7.06   Tc(MIN.) =   20.39
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.814
  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"       C       5.50      0.25      0.500      69
  COMMERCIAL                 C       1.50      0.25      0.100      69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.414
  SUBAREA AREA(ACRES) =    7.00      SUBAREA RUNOFF(CFS) =   10.78
  EFFECTIVE AREA(ACRES) =    15.10    AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.37
  TOTAL AREA(ACRES) =       15.1         PEAK FLOW RATE(CFS) =      23.39

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.57   HALFSTREET FLOOD WIDTH(FEET) =  23.35
  FLOW VELOCITY(FEET/SEC.) =  2.22   DEPTH*VELOCITY(FT*FT/SEC.) =   1.26
  LONGEST FLOWPATH FROM NODE    236.00 TO NODE    239.00 =   1681.00 FEET.

  *************************************************************************
  FLOW PROCESS FROM NODE    239.00 TO NODE    240.00 IS CODE =  62
  -----------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
  =======================================================================
  UPSTREAM ELEVATION(FEET) =   52.00  DOWNSTREAM ELEVATION(FEET) =   51.50
  STREET LENGTH(FEET) =   610.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00
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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) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      32.86
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.77
    HALFSTREET FLOOD WIDTH(FEET) =    33.54
    AVERAGE FLOW VELOCITY(FEET/SEC.) =     1.48
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =     1.14
  STREET FLOW TRAVEL TIME(MIN.) =   6.85   Tc(MIN.) =    27.24
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.537
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL    AREA       Fp         Ap    SCS
       LAND USE           GROUP    (ACRES)  (INCH/HR) (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       C       10.50      0.25      0.500     69
  COMMERCIAL                 C        4.00      0.25      0.100     69
  URBAN POOR COVER
  "TURF"                     C        0.10      0.25      1.000     83
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.394
  SUBAREA AREA(ACRES) =    14.60      SUBAREA RUNOFF(CFS) =    18.90
  EFFECTIVE AREA(ACRES) =     29.70    AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.38
  TOTAL AREA(ACRES) =        29.7       PEAK FLOW RATE(CFS) =      38.52

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.81   HALFSTREET FLOOD WIDTH(FEET) =  35.61
  FLOW VELOCITY(FEET/SEC.) =  1.54   DEPTH*VELOCITY(FT*FT/SEC.) =   1.25
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  610.0 FT WITH ELEVATION-DROP =   0.5 FT, IS   25.7 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    240.00
  LONGEST FLOWPATH FROM NODE    236.00 TO NODE    240.00 =   2291.00 FEET.

***************************************************************************
  FLOW PROCESS FROM NODE    240.00 TO NODE    241.00 IS CODE =   31
---------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     51.50  DOWNSTREAM(FEET) =     51.00
  FLOW LENGTH(FEET) =   131.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  29.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.30
  ESTIMATED PIPE DIAMETER(INCH) = 36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =        38.52
  PIPE TRAVEL TIME(MIN.) =   0.35   Tc(MIN.) =   27.58
  LONGEST FLOWPATH FROM NODE    236.00 TO NODE    241.00 =   2422.00 FEET.

***************************************************************************
  FLOW PROCESS FROM NODE    242.00 TO NODE    243.00 IS CODE =   21
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```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =     54.00  DOWNSTREAM(FEET) =     53.00


  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.862
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.751
  SUBAREA Tc 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"       C      1.70     0.25     0.500    69   12.62
  COMMERCIAL                 C      0.50     0.25     0.100    69    9.86
  URBAN POOR COVER
  "TURF"                     C      0.20     0.25     1.000    83   17.03
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.458
  SUBAREA RUNOFF(CFS) =      5.69
  TOTAL AREA(ACRES) =      2.40   PEAK FLOW RATE(CFS) =      5.69


****************************************************************************
  FLOW PROCESS FROM NODE    243.00 TO NODE    244.00 IS CODE =  62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =   53.00  DOWNSTREAM ELEVATION(FEET) =   52.00
  STREET LENGTH(FEET) =   412.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.96
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.49
    HALFSTREET FLOOD WIDTH(FEET) =   18.87
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.61
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.80
  STREET FLOW TRAVEL TIME(MIN.) =   4.26   Tc(MIN.) =   14.12
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.239
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/     SCS SOIL   AREA      Fp        Ap      SCS
       LAND USE          GROUP   (ACRES)  (INCH/HR) (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       C      4.50     0.25     0.500    69
  COMMERCIAL                 C      1.60     0.25     0.100    69
  URBAN POOR COVER
  "TURF"                     C      0.40     0.25     1.000    83
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.432
  SUBAREA AREA(ACRES) =    6.50      SUBAREA RUNOFF(CFS) =   12.47
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                            GC10EX
  EFFECTIVE AREA(ACRES) =      8.90    AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.44
  TOTAL AREA(ACRES) =          8.9        PEAK FLOW RATE(CFS) =      17.06

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.54   HALFSTREET FLOOD WIDTH(FEET) =  22.12
  FLOW VELOCITY(FEET/SEC.) =  1.81   DEPTH*VELOCITY(FT*FT/SEC.) =   0.98
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  412.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   14.3 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    244.00
  LONGEST FLOWPATH FROM NODE    242.00 TO NODE    244.00 =    742.00 FEET.

  **************************************************************************
  FLOW PROCESS FROM NODE    244.00 TO NODE    245.00 IS CODE =  31
  --------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
  ==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    52.00  DOWNSTREAM(FEET) =    51.00
  FLOW LENGTH(FEET) =   169.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.25
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       17.06
  PIPE TRAVEL TIME(MIN.) =   0.45    Tc(MIN.) =   14.57
  LONGEST FLOWPATH FROM NODE    242.00 TO NODE    245.00 =    911.00 FEET.

  **************************************************************************
  FLOW PROCESS FROM NODE    246.00 TO NODE    247.00 IS CODE =  21
  --------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
  ==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =     53.00  DOWNSTREAM(FEET) =     52.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.329
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) =   2.541
  SUBAREA Tc 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"       C       0.80      0.25      0.500     69   14.50
  COMMERCIAL                 C       0.40      0.25      0.100     69   11.33
  SCHOOL                     B       7.10      0.30      0.600     56   15.35
  SCHOOL                     C       9.60      0.25      0.600     69   15.35
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.27
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.584
  SUBAREA RUNOFF(CFS) =     38.38
  TOTAL AREA(ACRES) =    17.90  PEAK FLOW RATE(CFS) =    38.38

  **************************************************************************
  FLOW PROCESS FROM NODE    247.00 TO NODE    248.00 IS CODE =  62
  --------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
  ==========================================================================
  UPSTREAM ELEVATION(FEET) =  52.50  DOWNSTREAM ELEVATION(FEET) =   52.00
  STREET LENGTH(FEET) =  587.00   CURB HEIGHT(INCHES) =  6.0
                            106
```

  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   50.07
    STREET FLOWING FULL
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) = 0.88
    HALFSTREET FLOOD WIDTH(FEET) =   39.09
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   1.66
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.46
  STREET FLOW TRAVEL TIME(MIN.) =   5.90   Tc(MIN.) =   17.23
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.998
  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"   C   1.10   0.25   0.500   69
  COMMERCIAL   C   1.30   0.25   0.100   69
  SCHOOL   C   11.50   0.25   0.600   69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.545
  SUBAREA AREA(ACRES) =   13.90   SUBAREA RUNOFF(CFS) =   23.29
  EFFECTIVE AREA(ACRES) =   31.80   AREA-AVERAGED Fm(INCH/HR) = 0.15
  AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.57
  TOTAL AREA(ACRES) =   31.8   PEAK FLOW RATE(CFS) =   52.93

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.90   HALFSTREET FLOOD WIDTH(FEET) = 39.89
  FLOW VELOCITY(FEET/SEC.) = 1.68   DEPTH*VELOCITY(FT*FT/SEC.) =   1.51
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 587.0 FT WITH ELEVATION-DROP =   0.5 FT, IS   24.4 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   248.00
  LONGEST FLOWPATH FROM NODE   246.00 TO NODE   248.00 =   917.00 FEET.

  ****
  FLOW PROCESS FROM NODE   248.00 TO NODE   248.50 IS CODE =   31

  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
  ==
  ELEVATION DATA: UPSTREAM(FEET) =   52.00 DOWNSTREAM(FEET) =   50.00
  FLOW LENGTH(FEET) = 1285.00   MANNING'S N = 0.013
  DEPTH OF FLOW IN 48.0 INCH PIPE IS 38.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.88
  ESTIMATED PIPE DIAMETER(INCH) = 48.00   NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =   52.93
  PIPE TRAVEL TIME(MIN.) =   4.39   Tc(MIN.) =   21.62
  LONGEST FLOWPATH FROM NODE   246.00 TO NODE   248.50 =   2202.00 FEET.

  ****
  FLOW PROCESS FROM NODE   248.50 TO NODE   248.50 IS CODE =   81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==
MAINLINE Tc(MIN.) =   21.62
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.754
SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
     LAND USE   GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"   C   16.30   0.25   0.500   69
 COMMERCIAL   C   7.10   0.25   0.100   69
 URBAN POOR COVER
 "TURF"   C   1.70   0.25   1.000   83
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.421
 SUBAREA AREA(ACRES) =   25.10   SUBAREA RUNOFF(CFS) =   37.25
 EFFECTIVE AREA(ACRES) =   56.90   AREA-AVERAGED Fm(INCH/HR) = 0.13
 AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.50
 TOTAL AREA(ACRES) =   56.9   PEAK FLOW RATE(CFS) =   83.20

****
 FLOW PROCESS FROM NODE   249.00 TO NODE   250.00 IS CODE =   21

 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
 ELEVATION DATA: UPSTREAM(FEET) =   50.00 DOWNSTREAM(FEET) =   49.50

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.329
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.541
 SUBAREA Tc 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"   C   1.50   0.25   0.500   69   14.50
 COMMERCIAL   C   0.40   0.25   0.100   69   11.33
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.416
 SUBAREA RUNOFF(CFS) =   4.17
 TOTAL AREA(ACRES) =   1.90   PEAK FLOW RATE(CFS) =   4.17

****
 FLOW PROCESS FROM NODE   250.00 TO NODE   251.00 IS CODE =   62

 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION # 1 USED)<<<<<
==
 UPSTREAM ELEVATION(FEET) =   49.50 DOWNSTREAM ELEVATION(FEET) =   49.00
 STREET LENGTH(FEET) =   457.00   CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

```
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      6.46
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.46
   HALFSTREET FLOOD WIDTH(FEET) =   17.30
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.03
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.48
 STREET FLOW TRAVEL TIME(MIN.) =   7.41   Tc(MIN.) =   18.74
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.904
 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"       C       2.00     0.25     0.500     69
 COMMERCIAL                 C       0.80     0.25     0.100     69
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.386
 SUBAREA AREA(ACRES) =    2.80      SUBAREA RUNOFF(CFS) =    4.56
 EFFECTIVE AREA(ACRES) =     4.70    AREA-AVERAGED Fm(INCH/HR) =  0.10
 AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
 TOTAL AREA(ACRES) =        4.7       PEAK FLOW RATE(CFS) =       7.63

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.49   HALFSTREET FLOOD WIDTH(FEET) =  18.48
 FLOW VELOCITY(FEET/SEC.) = 1.07   DEPTH*VELOCITY(FT*FT/SEC.) =   0.52
 LONGEST FLOWPATH FROM NODE    249.00 TO NODE    251.00 =     787.00 FEET.

 ****************************************************************************
   FLOW PROCESS FROM NODE    251.00 TO NODE    252.00 IS CODE =  62
 ----------------------------------------------------------------------------
   >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
 ============================================================================
   UPSTREAM ELEVATION(FEET) =   49.00  DOWNSTREAM ELEVATION(FEET) =    47.00
   STREET LENGTH(FEET) =   920.00   CURB HEIGHT(INCHES) =  6.0
   STREET HALFWIDTH(FEET) = 20.00

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

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
   STREET PARKWAY CROSSFALL(DECIMAL)  = 0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.28
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.49
   HALFSTREET FLOOD WIDTH(FEET) =   18.79
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.53
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.75
 STREET FLOW TRAVEL TIME(MIN.) =   9.99   Tc(MIN.) =   28.73
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.491
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
      LAND USE           GROUP   (ACRES)  (INCH/HR) (DECIMAL)  CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"       C       4.20     0.25     0.500     69
 COMMERCIAL                 C       1.60     0.25     0.100     69
```

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  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.390
  SUBAREA AREA(ACRES) =    5.80       SUBAREA RUNOFF(CFS) =    7.27
  EFFECTIVE AREA(ACRES) =      10.50    AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.39
  TOTAL AREA(ACRES) =        10.5        PEAK FLOW RATE(CFS) =      13.16

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.52   HALFSTREET FLOOD WIDTH(FEET) =  20.73
  FLOW VELOCITY(FEET/SEC.) =  1.59   DEPTH*VELOCITY(FT*FT/SEC.) =   0.82
  LONGEST FLOWPATH FROM NODE    249.00 TO NODE    252.00 =   1707.00 FEET.

***************************************************************************
  FLOW PROCESS FROM NODE    252.00 TO NODE    253.00 IS CODE =  62
-------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
===============================================================================
  UPSTREAM ELEVATION(FEET) =   47.00  DOWNSTREAM ELEVATION(FEET) =   46.00
  STREET LENGTH(FEET) =   756.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.13
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.62
    HALFSTREET FLOOD WIDTH(FEET) =   25.85
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.55
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.96
  STREET FLOW TRAVEL TIME(MIN.) =   8.14   Tc(MIN.) =   36.87
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.292
  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"     C      9.10      0.25      0.500     69
  COMMERCIAL               C      3.50      0.25      0.100     69
  URBAN POOR COVER
  "TURF"                   C      0.40      0.25      1.000     83
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.408
  SUBAREA AREA(ACRES) =  13.00       SUBAREA RUNOFF(CFS) =   13.92
  EFFECTIVE AREA(ACRES) =      23.50    AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =        23.5        PEAK FLOW RATE(CFS) =      25.20

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.66   HALFSTREET FLOOD WIDTH(FEET) =  27.92
  FLOW VELOCITY(FEET/SEC.) =  1.65   DEPTH*VELOCITY(FT*FT/SEC.) =   1.09
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  756.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   23.0 CFS,
```

          WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   253.00
   LONGEST FLOWPATH FROM NODE   249.00 TO NODE   253.00 =   2463.00 FEET.

****
  FLOW PROCESS FROM NODE   253.00 TO NODE   253.50 IS CODE = 62

  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 1 USED)<<<<<
===
  UPSTREAM ELEVATION(FEET) =   46.00 DOWNSTREAM ELEVATION(FEET) =   45.50
  STREET LENGTH(FEET) =   172.00   CURB HEIGHT(INCHES) = 6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   31.42
    STREET FLOWING FULL
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) = 0.63
    HALFSTREET FLOOD WIDTH(FEET) =   26.28
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   2.34
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.46
  STREET FLOW TRAVEL TIME(MIN.) =   1.23   Tc(MIN.) =   38.10
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.268
  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"   C   8.20   0.25   0.500   69
  COMMERCIAL   C   3.40   0.25   0.100   69
  URBAN POOR COVER
  "TURF"   C   0.20   0.25   1.000   83
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.393
  SUBAREA AREA(ACRES) =   11.80   SUBAREA RUNOFF(CFS) =   12.42
  EFFECTIVE AREA(ACRES) =   35.30   AREA-AVERAGED Fm(INCH/HR) = 0.10
  AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.40
  TOTAL AREA(ACRES) =   35.3   PEAK FLOW RATE(CFS) =   37.12

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.66   HALFSTREET FLOOD WIDTH(FEET) = 27.86
  FLOW VELOCITY(FEET/SEC.) = 2.45   DEPTH*VELOCITY(FT*FT/SEC.) =   1.61
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L = 172.0 FT WITH ELEVATION-DROP =   0.5 FT, IS   32.7 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   253.50
  LONGEST FLOWPATH FROM NODE   249.00 TO NODE   253.50 =   2635.00 FEET.

****
  FLOW PROCESS FROM NODE   253.50 TO NODE   254.00 IS CODE = 31

  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===

```
  ELEVATION DATA: UPSTREAM(FEET) =    45.50  DOWNSTREAM(FEET) =    45.00
  FLOW LENGTH(FEET) =   143.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  29.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.03
  ESTIMATED PIPE DIAMETER(INCH) = 36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       37.12
  PIPE TRAVEL TIME(MIN.) =   0.39    Tc(MIN.) =   38.49
  LONGEST FLOWPATH FROM NODE    249.00 TO NODE    254.00 =    2778.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    255.00 TO NODE    256.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =    50.00  DOWNSTREAM(FEET) =    48.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   8.586
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.978
  SUBAREA Tc 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"       C       2.60      0.25      0.500     69   10.99
  COMMERCIAL                 C       1.40      0.25      0.100     69    8.59
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.360
  SUBAREA RUNOFF(CFS) =      10.40
  TOTAL AREA(ACRES) =     4.00   PEAK FLOW RATE(CFS) =      10.40

**************************************************************************
  FLOW PROCESS FROM NODE    256.00 TO NODE    257.00 IS CODE =  62
--------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
==========================================================================
  UPSTREAM ELEVATION(FEET) =   48.00  DOWNSTREAM ELEVATION(FEET) =   47.00
  STREET LENGTH(FEET) =   425.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 42.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  21.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.67
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.60
    HALFSTREET FLOOD WIDTH(FEET) =    21.94
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.77
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.05
  STREET FLOW TRAVEL TIME(MIN.) =   4.01   Tc(MIN.) =   12.60
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.391
  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"       C       4.60      0.25      0.500     69
 COMMERCIAL                 C       2.40      0.25      0.100     69
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.363
 SUBAREA AREA(ACRES) =    7.00      SUBAREA RUNOFF(CFS) =   14.49
 EFFECTIVE AREA(ACRES) =     11.00    AREA-AVERAGED Fm(INCH/HR) =  0.09
 AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.36
 TOTAL AREA(ACRES) =       11.0         PEAK FLOW RATE(CFS) =     22.77

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.64   HALFSTREET FLOOD WIDTH(FEET) = 24.24
 FLOW VELOCITY(FEET/SEC.) =  1.88   DEPTH*VELOCITY(FT*FT/SEC.) =   1.21
 LONGEST FLOWPATH FROM NODE    255.00 TO NODE    257.00 =     755.00 FEET.

*****************************************************************************
 FLOW PROCESS FROM NODE    257.00 TO NODE    258.00 IS CODE =  62
-----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
=============================================================================
 UPSTREAM ELEVATION(FEET) =   47.00  DOWNSTREAM ELEVATION(FEET) =   46.00
 STREET LENGTH(FEET) = 1528.00   CURB HEIGHT(INCHES) =  8.0
 STREET HALFWIDTH(FEET) = 42.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  21.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      34.01
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.87
   HALFSTREET FLOOD WIDTH(FEET) =   46.19
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.21
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.06
 STREET FLOW TRAVEL TIME(MIN.) =  21.10   Tc(MIN.) =   33.70
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.360
 SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp        Ap      SCS
     LAND USE            GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"       C      13.00      0.25      0.500     69
 COMMERCIAL                 C       6.40      0.25      0.100     69
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.368
 SUBAREA AREA(ACRES) =  19.40      SUBAREA RUNOFF(CFS) =   22.15
 EFFECTIVE AREA(ACRES) =     30.40    AREA-AVERAGED Fm(INCH/HR) =  0.09
 AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.37
 TOTAL AREA(ACRES) =       30.4         PEAK FLOW RATE(CFS) =     34.72

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.88   HALFSTREET FLOOD WIDTH(FEET) = 46.69
 FLOW VELOCITY(FEET/SEC.) =  1.21   DEPTH*VELOCITY(FT*FT/SEC.) =   1.07
```

```
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1528.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   26.7 CFS,
          WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    258.00
   LONGEST FLOWPATH FROM NODE    255.00 TO NODE    258.00 =    2283.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    258.00 TO NODE    259.00 IS CODE =  62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =   46.00  DOWNSTREAM ELEVATION(FEET) =    44.00
  STREET LENGTH(FEET) = 1287.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      43.95
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.76
    HALFSTREET FLOOD WIDTH(FEET) =   33.17
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.03
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.55
  STREET FLOW TRAVEL TIME(MIN.) = 10.57   Tc(MIN.) =   44.27
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.164
  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"       C       14.20     0.25      0.500     69
  COMMERCIAL                 C        4.80     0.25      0.100     69
  URBAN POOR COVER
  "TURF"                     C        0.30     0.25      1.000     83
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.408
  SUBAREA AREA(ACRES) =   19.30      SUBAREA RUNOFF(CFS) =   18.44
  EFFECTIVE AREA(ACRES) =    49.70    AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.38
  TOTAL AREA(ACRES) =       49.7       PEAK FLOW RATE(CFS) =      47.77

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.79   HALFSTREET FLOOD WIDTH(FEET) = 34.27
  FLOW VELOCITY(FEET/SEC.) =  2.06   DEPTH*VELOCITY(FT*FT/SEC.) =   1.62
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1287.0 FT WITH ELEVATION-DROP =   2.0 FT, IS   30.6 CFS,
          WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    259.00
   LONGEST FLOWPATH FROM NODE    255.00 TO NODE    259.00 =    3570.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    259.00 TO NODE    260.00 IS CODE =  31
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    44.00  DOWNSTREAM(FEET) =    43.00
  FLOW LENGTH(FEET) =   135.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  26.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.69
  ESTIMATED PIPE DIAMETER(INCH) = 36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      47.77
  PIPE TRAVEL TIME(MIN.) =   0.26    Tc(MIN.) =   44.53
  LONGEST FLOWPATH FROM NODE    255.00 TO NODE    260.00 =   3705.00 FEET.


*******************************************************************************
  FLOW PROCESS FROM NODE    261.00 TO NODE    262.00 IS CODE =  21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
===============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =    56.00  DOWNSTREAM(FEET) =    54.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   8.586
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.978
  SUBAREA Tc 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"       C       1.70      0.25     0.500     69   10.99
  COMMERCIAL                 C       3.00      0.25     0.100     69    8.59
  SCHOOL                     C       1.10      0.25     0.600     69   11.64
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.312
  SUBAREA RUNOFF(CFS) =     15.14
  TOTAL AREA(ACRES) =      5.80   PEAK FLOW RATE(CFS) =     15.14


*******************************************************************************
  FLOW PROCESS FROM NODE    262.00 TO NODE    263.00 IS CODE =  62
-------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
===============================================================================
  UPSTREAM ELEVATION(FEET) =   54.00  DOWNSTREAM ELEVATION(FEET) =   52.00
  STREET LENGTH(FEET) =   704.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      26.02
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.59
    HALFSTREET FLOOD WIDTH(FEET) =   24.75
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.19
```

     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.30
   STREET FLOW TRAVEL TIME(MIN.) =   5.37   Tc(MIN.) =   13.95
   * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.255
   SUBAREA LOSS RATE DATA(AMC II):
    DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
        LAND USE   GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
   RESIDENTIAL
   "5-7 DWELLINGS/ACRE"   C   4.30   0.25   0.500   69
   COMMERCIAL   C   2.30   0.25   0.100   69
   URBAN POOR COVER
   "TURF"   C   0.20   0.25   1.000   83
   SCHOOL   C   4.40   0.25   0.600   69
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.466
   SUBAREA AREA(ACRES) =   11.20   SUBAREA RUNOFF(CFS) =   21.55
   EFFECTIVE AREA(ACRES) =   17.00   AREA-AVERAGED Fm(INCH/HR) = 0.10
   AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.41
   TOTAL AREA(ACRES) =   17.0   PEAK FLOW RATE(CFS) =   32.92

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 0.64   HALFSTREET FLOOD WIDTH(FEET) = 26.82
   FLOW VELOCITY(FEET/SEC.) = 2.35   DEPTH*VELOCITY(FT*FT/SEC.) =   1.49
   *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 704.0 FT WITH ELEVATION-DROP =   2.0 FT, IS   22.0 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   263.00
   LONGEST FLOWPATH FROM NODE   261.00 TO NODE   263.00 =   1034.00 FEET.

   ****
    FLOW PROCESS FROM NODE   263.00 TO NODE   264.00 IS CODE = 62

    >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
    >>>>>(STREET TABLE SECTION # 1 USED)<<<<<
   ===
    UPSTREAM ELEVATION(FEET) =   52.00 DOWNSTREAM ELEVATION(FEET) =   48.00
    STREET LENGTH(FEET) = 2045.00   CURB HEIGHT(INCHES) = 6.0
    STREET HALFWIDTH(FEET) = 20.00

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

    SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
    STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
    Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
    Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

      **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   46.44
      STREET FLOWING FULL
      STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
      STREET FLOW DEPTH(FEET) = 0.75
      HALFSTREET FLOOD WIDTH(FEET) =   32.44
      AVERAGE FLOW VELOCITY(FEET/SEC.) =   2.24
      PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.68
    STREET FLOW TRAVEL TIME(MIN.) = 15.19   Tc(MIN.) =   29.14
    * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.479
    SUBAREA LOSS RATE DATA(AMC II):
     DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
         LAND USE   GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
    RESIDENTIAL
    "5-7 DWELLINGS/ACRE"   C   14.90   0.25   0.500   69

```
COMMERCIAL                    C        5.80      0.25      0.100     69
URBAN POOR COVER
"TURF"                        C        0.90      0.25      1.000     83
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.413
SUBAREA AREA(ACRES) =    21.60      SUBAREA RUNOFF(CFS) =    26.74
EFFECTIVE AREA(ACRES) =      38.60    AREA-AVERAGED Fm(INCH/HR) =  0.10
AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.41
TOTAL AREA(ACRES) =       38.6        PEAK FLOW RATE(CFS) =      47.78

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.76   HALFSTREET FLOOD WIDTH(FEET) =  32.81
FLOW VELOCITY(FEET/SEC.) =  2.26   DEPTH*VELOCITY(FT*FT/SEC.) =   1.71
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 2045.0 FT WITH ELEVATION-DROP =   4.0 FT, IS   31.5 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    264.00
LONGEST FLOWPATH FROM NODE    261.00 TO NODE    264.00 =   3079.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    264.00 TO NODE    265.00 IS CODE =  31
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    48.00  DOWNSTREAM(FEET) =    47.00
  FLOW LENGTH(FEET) =    200.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  27.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.51
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       47.78
  PIPE TRAVEL TIME(MIN.) =   0.44    Tc(MIN.) =   29.58
  LONGEST FLOWPATH FROM NODE    261.00 TO NODE    265.00 =   3279.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    266.00 TO NODE    267.00 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =    50.00  DOWNSTREAM(FEET) =    49.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   9.862
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.751
  SUBAREA Tc 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"      C        5.30      0.25      0.500     69   12.62
  COMMERCIAL                C        1.90      0.25      0.100     69    9.86
  URBAN POOR COVER
  "TURF"                    C        0.40      0.25      1.000     83   17.03
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.426
  SUBAREA RUNOFF(CFS) =     18.09
  TOTAL AREA(ACRES) =      7.60   PEAK FLOW RATE(CFS) =     18.09

**************************************************************************
  FLOW PROCESS FROM NODE    267.00 TO NODE    268.00 IS CODE =  62
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>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STREET TABLE SECTION # 1 USED)<<<<<
==
UPSTREAM ELEVATION(FEET) =   49.00 DOWNSTREAM ELEVATION(FEET) =   48.00
STREET LENGTH(FEET) =   513.00   CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

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

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   29.56
  STREET FLOWING FULL
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) = 0.65
  HALFSTREET FLOOD WIDTH(FEET) =   27.62
  AVERAGE FLOW VELOCITY(FEET/SEC.) =   1.98
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.29
STREET FLOW TRAVEL TIME(MIN.) =   4.31   Tc(MIN.) =   14.17
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.235
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"   C   7.60   0.25   0.500   69
COMMERCIAL   C   3.60   0.25   0.100   69
URBAN POOR COVER
"TURF"   C   0.70   0.25   1.000   83
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.408
SUBAREA AREA(ACRES) =   11.90   SUBAREA RUNOFF(CFS) =   22.84
EFFECTIVE AREA(ACRES) =   19.50   AREA-AVERAGED Fm(INCH/HR) = 0.10
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.42
TOTAL AREA(ACRES) =   19.5   PEAK FLOW RATE(CFS) =   37.39

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.70   HALFSTREET FLOOD WIDTH(FEET) = 30.00
FLOW VELOCITY(FEET/SEC.) = 2.12   DEPTH*VELOCITY(FT*FT/SEC.) =   1.48
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 513.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   24.2 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   268.00
LONGEST FLOWPATH FROM NODE   266.00 TO NODE   268.00 =   843.00 FEET.

****
FLOW PROCESS FROM NODE   268.00 TO NODE   269.00 IS CODE = 62

>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STREET TABLE SECTION # 1 USED)<<<<<
==
UPSTREAM ELEVATION(FEET) =   48.00 DOWNSTREAM ELEVATION(FEET) =   47.00
STREET LENGTH(FEET) =   809.00   CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 10.00

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

    SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
    STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
    Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
    Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

      **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      50.04
      ***STREET FLOWING FULL***
      STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
      STREET FLOW DEPTH(FEET) =  0.83
      HALFSTREET FLOOD WIDTH(FEET) =   36.41
      AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.91
      PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.58
    STREET FLOW TRAVEL TIME(MIN.) =   7.05   Tc(MIN.) =   21.22
    *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.773
    SUBAREA LOSS RATE DATA(AMC  II):
     DEVELOPMENT TYPE/      SCS SOIL    AREA      Fp        Ap     SCS
         LAND USE           GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
    RESIDENTIAL
    "5-7 DWELLINGS/ACRE"       C      10.20     0.25      0.500     69
    COMMERCIAL                 C       5.80     0.25      0.100     69
    URBAN POOR COVER
    "TURF"                     C       0.70     0.25      1.000     83
    SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
    SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.382
    SUBAREA AREA(ACRES) =   16.70      SUBAREA RUNOFF(CFS) =   25.22
    EFFECTIVE AREA(ACRES) =      36.20    AREA-AVERAGED Fm(INCH/HR) =  0.10
    AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
    TOTAL AREA(ACRES) =       36.2        PEAK FLOW RATE(CFS) =      54.51

    END OF SUBAREA STREET FLOW HYDRAULICS:
    DEPTH(FEET) = 0.85   HALFSTREET FLOOD WIDTH(FEET) = 37.57
    FLOW VELOCITY(FEET/SEC.) = 1.96   DEPTH*VELOCITY(FT*FT/SEC.) =   1.67
    *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
           AND L =  809.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   28.9 CFS,
           WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    269.00
    LONGEST FLOWPATH FROM NODE    266.00 TO NODE    269.00 =   1652.00 FEET.

    *************************************************************************
     FLOW PROCESS FROM NODE    269.00 TO NODE    270.00 IS CODE =  62
    -----------------------------------------------------------------------
     >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
     >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
    ========================================================================
     UPSTREAM ELEVATION(FEET) =   47.00  DOWNSTREAM ELEVATION(FEET) =   46.00
     STREET LENGTH(FEET) = 1458.00   CURB HEIGHT(INCHES) =  6.0
     STREET HALFWIDTH(FEET) = 20.00

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

     SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
     STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
     Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
     Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

       **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      69.65
```

    STREET FLOWING FULL
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) = 1.03
    HALFSTREET FLOOD WIDTH(FEET) =   46.29
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   1.64
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.68
  STREET FLOW TRAVEL TIME(MIN.) = 14.83   Tc(MIN.) =   36.05
  * 10 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
  "5-7 DWELLINGS/ACRE"   C   11.00   0.25   0.500   69
  COMMERCIAL   C   15.30   0.25   0.100   69
  URBAN POOR COVER
  "TURF"   C   0.80   0.25   1.000   83
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.289
  SUBAREA AREA(ACRES) =   27.10   SUBAREA RUNOFF(CFS) =   30.16
  EFFECTIVE AREA(ACRES) =   63.30   AREA-AVERAGED Fm(INCH/HR) = 0.09
  AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.35
  TOTAL AREA(ACRES) =   63.3   PEAK FLOW RATE(CFS) =   69.54

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 1.03   HALFSTREET FLOOD WIDTH(FEET) = 46.29
  FLOW VELOCITY(FEET/SEC.) = 1.64   DEPTH*VELOCITY(FT*FT/SEC.) =   1.68
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1458.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   38.5 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   270.00
  LONGEST FLOWPATH FROM NODE   266.00 TO NODE   270.00 =   3110.00 FEET.

  ****
  FLOW PROCESS FROM NODE   270.00 TO NODE   271.00 IS CODE = 31

  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
  ==
  ELEVATION DATA: UPSTREAM(FEET) =   46.00 DOWNSTREAM(FEET) =   45.00
  FLOW LENGTH(FEET) =   218.00   MANNING'S N = 0.013
  DEPTH OF FLOW IN 45.0 INCH PIPE IS 33.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.96
  ESTIMATED PIPE DIAMETER(INCH) = 45.00   NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =   69.54
  PIPE TRAVEL TIME(MIN.) =   0.46   Tc(MIN.) =   36.51
  LONGEST FLOWPATH FROM NODE   266.00 TO NODE   271.00 =   3328.00 FEET.

  ****
  FLOW PROCESS FROM NODE   272.00 TO NODE   273.00 IS CODE = 21

  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
  ==
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =   45.00 DOWNSTREAM(FEET) =   44.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   9.862
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751
  SUBAREA Tc 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"        C       4.00      0.25      0.500    69    12.62
   COMMERCIAL                  C       1.80      0.25      0.100    69     9.86
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.376
   SUBAREA RUNOFF(CFS) =      13.87
   TOTAL AREA(ACRES) =      5.80   PEAK FLOW RATE(CFS) =      13.87

***************************************************************************
  FLOW PROCESS FROM NODE   273.00 TO NODE   274.00 IS CODE =  62
-------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
===============================================================================
  UPSTREAM ELEVATION(FEET) =   44.00  DOWNSTREAM ELEVATION(FEET) =   42.00
  STREET LENGTH(FEET) =   863.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      21.03
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.58
    HALFSTREET FLOOD WIDTH(FEET) =   23.83
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.91
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.10
  STREET FLOW TRAVEL TIME(MIN.) =   7.53   Tc(MIN.) =   17.39
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.987
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
   RESIDENTIAL
   "5-7 DWELLINGS/ACRE"        C       3.20      0.25      0.500    69
   RESIDENTIAL
   "5-7 DWELLINGS/ACRE"        D       2.80      0.20      0.500    75
   COMMERCIAL                  C       0.80      0.25      0.100    69
   COMMERCIAL                  D       1.50      0.20      0.100    75
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.23
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.389
   SUBAREA AREA(ACRES) =    8.30      SUBAREA RUNOFF(CFS) =   14.19
   EFFECTIVE AREA(ACRES) =     14.10    AREA-AVERAGED Fm(INCH/HR) =  0.09
   AREA-AVERAGED Fp(INCH/HR) =  0.24  AREA-AVERAGED Ap =  0.38
   TOTAL AREA(ACRES) =      14.1         PEAK FLOW RATE(CFS) =      24.07

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 0.60   HALFSTREET FLOOD WIDTH(FEET) =  24.93
   FLOW VELOCITY(FEET/SEC.) =  1.99   DEPTH*VELOCITY(FT*FT/SEC.) =   1.19
   *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  863.0 FT WITH ELEVATION-DROP =   2.0 FT, IS   15.3 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    274.00
   LONGEST FLOWPATH FROM NODE    272.00 TO NODE    274.00 =    1193.00 FEET.
```

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*************************************************************************
  FLOW PROCESS FROM NODE    274.00 TO NODE    278.00 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    42.00  DOWNSTREAM(FEET) =    40.00
  FLOW LENGTH(FEET) =   494.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  23.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.75
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       24.07
  PIPE TRAVEL TIME(MIN.) =   1.43    Tc(MIN.) =   18.82
  LONGEST FLOWPATH FROM NODE    272.00 TO NODE    278.00 =    1687.00 FEET.

*************************************************************************
  FLOW PROCESS FROM NODE    278.00 TO NODE    278.00 IS CODE =   1
-------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
===============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   18.82
  RAINFALL INTENSITY(INCH/HR) =   1.90
  AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.24
  AREA-AVERAGED Ap =  0.38
  EFFECTIVE STREAM AREA(ACRES) =      14.10
  TOTAL STREAM AREA(ACRES) =      14.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      24.07

*************************************************************************
  FLOW PROCESS FROM NODE    275.00 TO NODE    276.00 IS CODE =  21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
===============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =     46.00  DOWNSTREAM(FEET) =     44.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.586
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.978
  SUBAREA Tc 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"       C       1.20     0.25      0.500     69   10.99
  COMMERCIAL                 C       0.30     0.25      0.100     69    8.59
  URBAN POOR COVER
  "TURF"                     C       0.20     0.25      1.000     83   14.83
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.488
  SUBAREA RUNOFF(CFS) =      4.37
  TOTAL AREA(ACRES) =      1.70   PEAK FLOW RATE(CFS) =      4.37

*************************************************************************
  FLOW PROCESS FROM NODE    276.00 TO NODE    277.00 IS CODE =  62
-------------------------------------------------------------------------------
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  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
===============================================================================
  UPSTREAM ELEVATION(FEET) =   44.00  DOWNSTREAM ELEVATION(FEET) =    42.00
  STREET LENGTH(FEET) =   453.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      7.43
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.39
    HALFSTREET FLOOD WIDTH(FEET) =   13.79
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.81
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.71
  STREET FLOW TRAVEL TIME(MIN.) =   4.16   Tc(MIN.) =   12.75
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.374
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/     SCS SOIL   AREA      Fp        Ap     SCS
       LAND USE          GROUP   (ACRES)  (INCH/HR) (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"      C      2.00     0.25     0.500    69
  COMMERCIAL                C      0.70     0.25     0.100    69
  URBAN POOR COVER
  "TURF"                    C      0.30     0.25     1.000    83
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.457
  SUBAREA AREA(ACRES) =    3.00      SUBAREA RUNOFF(CFS) =    6.10
  EFFECTIVE AREA(ACRES) =      4.70    AREA-AVERAGED Fm(INCH/HR) =  0.12
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.47
  TOTAL AREA(ACRES) =       4.7        PEAK FLOW RATE(CFS) =       9.55

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.42   HALFSTREET FLOOD WIDTH(FEET) =  15.27
  FLOW VELOCITY(FEET/SEC.) = 1.92   DEPTH*VELOCITY(FT*FT/SEC.) =   0.81
  LONGEST FLOWPATH FROM NODE    275.00 TO NODE    277.00 =     783.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    277.00 TO NODE    278.00 IS CODE =  62
----------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
===============================================================================
  UPSTREAM ELEVATION(FEET) =   42.00  DOWNSTREAM ELEVATION(FEET) =    40.00
  STREET LENGTH(FEET) =   735.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

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

Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   17.62
   STREET FLOWING FULL
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.54
   HALFSTREET FLOOD WIDTH(FEET) =   21.94
   AVERAGE FLOW VELOCITY(FEET/SEC.) =   1.90
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.02
STREET FLOW TRAVEL TIME(MIN.) =   6.45   Tc(MIN.) =   19.20
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.878
SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
     LAND USE   GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"5-7 DWELLINGS/ACRE"   C   2.30   0.25   0.500   69
RESIDENTIAL
"5-7 DWELLINGS/ACRE"   D   5.50   0.20   0.500   75
COMMERCIAL   C   0.90   0.25   0.100   69
COMMERCIAL   D   0.80   0.20   0.100   75
URBAN POOR COVER
"TURF"   C   0.30   0.25   1.000   83
URBAN POOR COVER
"TURF"   D   0.20   0.20   1.000   87
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.22
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.457
SUBAREA AREA(ACRES) =   10.00   SUBAREA RUNOFF(CFS) =   16.01
EFFECTIVE AREA(ACRES) =   14.70   AREA-AVERAGED Fm(INCH/HR) = 0.10
AREA-AVERAGED Fp(INCH/HR) = 0.23 AREA-AVERAGED Ap = 0.46
TOTAL AREA(ACRES) =   14.7   PEAK FLOW RATE(CFS) =   23.46

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.58   HALFSTREET FLOOD WIDTH(FEET) = 24.08
FLOW VELOCITY(FEET/SEC.) = 2.09   DEPTH*VELOCITY(FT*FT/SEC.) =   1.21
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 735.0 FT WITH ELEVATION-DROP =   2.0 FT, IS   19.5 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   278.00
LONGEST FLOWPATH FROM NODE   275.00 TO NODE   278.00 =   1518.00 FEET.

****
  FLOW PROCESS FROM NODE   278.00 TO NODE   278.00 IS CODE =   1

 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==
 TOTAL NUMBER OF STREAMS = 2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
 TIME OF CONCENTRATION(MIN.) =   19.20
 RAINFALL INTENSITY(INCH/HR) =   1.88
 AREA-AVERAGED Fm(INCH/HR) = 0.10
 AREA-AVERAGED Fp(INCH/HR) = 0.23
 AREA-AVERAGED Ap = 0.46
 EFFECTIVE STREAM AREA(ACRES) =   14.70
 TOTAL STREAM AREA(ACRES) =   14.70
 PEAK FLOW RATE(CFS) AT CONFLUENCE =   23.46

 ** CONFLUENCE DATA **
  STREAM   Q   Tc   Intensity   Fp(Fm)   Ap   Ae   HEADWATER
  NUMBER   (CFS) (MIN.) (INCH/HR) (INCH/HR)   (ACRES)   NODE

```
      1      24.07   18.82    1.899  0.24( 0.09) 0.38      14.1     272.00
      2      23.46   19.20    1.878  0.23( 0.10) 0.46      14.7     275.00


  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      47.35   18.82    1.899  0.23( 0.10) 0.42      28.5     272.00
      2      47.25   19.20    1.878  0.23( 0.10) 0.42      28.8     275.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      47.35    Tc(MIN.) =    18.82
  EFFECTIVE AREA(ACRES) =     28.51   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.23  AREA-AVERAGED Ap =  0.42
  TOTAL AREA(ACRES) =      28.8
  LONGEST FLOWPATH FROM NODE    272.00 TO NODE    278.00 =    1687.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    278.00 TO NODE    279.00 IS CODE =   31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     40.00  DOWNSTREAM(FEET) =     39.00
  FLOW LENGTH(FEET) =    156.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  27.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.14
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       47.35
  PIPE TRAVEL TIME(MIN.) =   0.32    Tc(MIN.) =   19.14
  LONGEST FLOWPATH FROM NODE    272.00 TO NODE    279.00 =    1843.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    280.00 TO NODE    281.00 IS CODE =   21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    330.00
  ELEVATION DATA: UPSTREAM(FEET) =     40.00  DOWNSTREAM(FEET) =     39.50
```

$$Tc = K*[(LENGTH^{3.00})/(ELEVATION\ CHANGE)]^{0.20}$$

```
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.329
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.541
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
```

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL "5-7 DWELLINGS/ACRE"	C	0.30	0.25	0.500	69	14.50
RESIDENTIAL "5-7 DWELLINGS/ACRE"	D	0.40	0.20	0.500	75	14.50
COMMERCIAL	C	0.10	0.25	0.100	69	11.33
COMMERCIAL	D	0.40	0.20	0.100	75	11.33
URBAN POOR COVER "TURF"	C	0.10	0.25	1.000	83	19.56
URBAN POOR COVER "TURF"	D	4.50	0.20	1.000	87	19.56

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
```

```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.862
  SUBAREA RUNOFF(CFS) =     12.35
  TOTAL AREA(ACRES) =      5.80   PEAK FLOW RATE(CFS) =     12.35


****************************************************************************
  FLOW PROCESS FROM NODE    281.00 TO NODE    282.00 IS CODE =  62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =   39.50  DOWNSTREAM ELEVATION(FEET) =   36.00
  STREET LENGTH(FEET) =   640.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      17.07
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.49
    HALFSTREET FLOOD WIDTH(FEET) =   18.48
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.40
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.16
  STREET FLOW TRAVEL TIME(MIN.) =   4.45   Tc(MIN.) =   15.78
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.101
  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"      D       1.00     0.20     0.500    75
  COMMERCIAL               D       0.50     0.20     0.100    75
  URBAN POOR COVER
  "TURF"                   D       3.90     0.20     1.000    87
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.824
  SUBAREA AREA(ACRES) =    5.40       SUBAREA RUNOFF(CFS) =    9.41
  EFFECTIVE AREA(ACRES) =     11.20    AREA-AVERAGED Fm(INCH/HR) =  0.17
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.84
  TOTAL AREA(ACRES) =        11.2        PEAK FLOW RATE(CFS) =      19.47

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.50   HALFSTREET FLOOD WIDTH(FEET) = 19.64
  FLOW VELOCITY(FEET/SEC.) =  2.48   DEPTH*VELOCITY(FT*FT/SEC.) =   1.25
  LONGEST FLOWPATH FROM NODE    280.00 TO NODE    282.00 =    970.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    282.00 TO NODE    283.00 IS CODE =  31
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    36.00  DOWNSTREAM(FEET) =    35.00
  FLOW LENGTH(FEET) =   470.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  23.2 INCHES
```

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.37
  ESTIMATED PIPE DIAMETER(INCH) = 33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       19.47
  PIPE TRAVEL TIME(MIN.) =   1.79    Tc(MIN.) =   17.57
  LONGEST FLOWPATH FROM NODE    280.00 TO NODE    283.00 =    1440.00 FEET.


**************************************************************************
  FLOW PROCESS FROM NODE    283.00 TO NODE    283.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  MAINLINE Tc(MIN.) =   17.57
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.976
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA       Fp        Ap      SCS
       LAND USE          GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       D       1.10      0.20      0.500     75
  COMMERCIAL                 D       0.60      0.20      0.100     75
  URBAN POOR COVER
  "TURF"                     D       5.60      0.20      1.000     87
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.851
  SUBAREA AREA(ACRES) =    7.30      SUBAREA RUNOFF(CFS) =    11.86
  EFFECTIVE AREA(ACRES) =     18.50   AREA-AVERAGED Fm(INCH/HR) =  0.17
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.85
  TOTAL AREA(ACRES) =       18.5      PEAK FLOW RATE(CFS) =     30.06


**************************************************************************
  FLOW PROCESS FROM NODE    284.00 TO NODE    285.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =     34.00  DOWNSTREAM(FEET) =     32.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   14.827
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.178
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA       Fp        Ap      SCS   Tc
       LAND USE          GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  URBAN POOR COVER
  "TURF"                     D       8.10      0.20      1.000     87  14.83
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      14.42
  TOTAL AREA(ACRES) =       8.10   PEAK FLOW RATE(CFS) =      14.42


**************************************************************************
  FLOW PROCESS FROM NODE    285.00 TO NODE    286.00 IS CODE =  62
--------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
==========================================================================
  UPSTREAM ELEVATION(FEET) =   32.00  DOWNSTREAM ELEVATION(FEET) =   31.50
  STREET LENGTH(FEET) =   163.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00
```

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   20.58
    STREET FLOWING FULL
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) = 0.55
    HALFSTREET FLOOD WIDTH(FEET) =   22.61
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   2.08
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.15
  STREET FLOW TRAVEL TIME(MIN.) =   1.30   Tc(MIN.) =   16.13
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.075
  SUBAREA LOSS RATE DATA(AMC II):
   DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
       LAND USE   GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
  URBAN POOR COVER
  "TURF"   D   7.20   0.20   1.000   87
  SCHOOL   D   0.10   0.20   0.600   75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.995
  SUBAREA AREA(ACRES) =   7.30   SUBAREA RUNOFF(CFS) =   12.33
  EFFECTIVE AREA(ACRES) =   15.40   AREA-AVERAGED Fm(INCH/HR) = 0.20
  AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 1.00
  TOTAL AREA(ACRES) =   15.4   PEAK FLOW RATE(CFS) =   25.99

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.59   HALFSTREET FLOOD WIDTH(FEET) = 24.44
  FLOW VELOCITY(FEET/SEC.) = 2.24   DEPTH*VELOCITY(FT*FT/SEC.) =   1.32
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 163.0 FT WITH ELEVATION-DROP =   0.5 FT, IS   16.6 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   286.00
  LONGEST FLOWPATH FROM NODE   284.00 TO NODE   286.00 =   493.00 FEET.

****
  FLOW PROCESS FROM NODE   286.00 TO NODE   287.00 IS CODE = 31

  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==
  ELEVATION DATA: UPSTREAM(FEET) =   31.50 DOWNSTREAM(FEET) =   31.00
  FLOW LENGTH(FEET) =   888.00   MANNING'S N = 0.013
  DEPTH OF FLOW IN 45.0 INCH PIPE IS 35.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.81
  ESTIMATED PIPE DIAMETER(INCH) = 45.00   NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =   25.99
  PIPE TRAVEL TIME(MIN.) =   5.27   Tc(MIN.) =   21.40
  LONGEST FLOWPATH FROM NODE   284.00 TO NODE   287.00 =   1381.00 FEET.

****
  FLOW PROCESS FROM NODE   287.00 TO NODE   287.00 IS CODE = 81

  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==
  MAINLINE Tc(MIN.) =   21.40

```
   *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.764
   SUBAREA LOSS RATE DATA(AMC  II):
    DEVELOPMENT TYPE/      SCS SOIL    AREA      Fp         Ap     SCS
        LAND USE            GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
   URBAN POOR COVER
   "TURF"                    D       12.80     0.20      1.000     87
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
   SUBAREA AREA(ACRES) =   12.80     SUBAREA RUNOFF(CFS) =   18.02
   EFFECTIVE AREA(ACRES) =    28.20   AREA-AVERAGED Fm(INCH/HR) =  0.20
   AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  1.00
   TOTAL AREA(ACRES) =       28.2      PEAK FLOW RATE(CFS) =      39.71

***************************************************************************
   FLOW PROCESS FROM NODE    288.00 TO NODE    289.00 IS CODE =  21
   -------------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
   >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
   ===============================================================================
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
   ELEVATION DATA: UPSTREAM(FEET) =     44.00  DOWNSTREAM(FEET) =     43.50

   Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
   SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.329
   *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.541
   SUBAREA Tc 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"      C        1.70     0.25      0.500     69   14.50
   COMMERCIAL                C        0.50     0.25      0.100     69   11.33
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.409
   SUBAREA RUNOFF(CFS) =      4.83
   TOTAL AREA(ACRES) =       2.20   PEAK FLOW RATE(CFS) =      4.83

***************************************************************************
   FLOW PROCESS FROM NODE    289.00 TO NODE    290.00 IS CODE =  62
   -------------------------------------------------------------------------------
   >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
   ===============================================================================
   UPSTREAM ELEVATION(FEET) =   43.50  DOWNSTREAM ELEVATION(FEET) =   43.00
   STREET LENGTH(FEET) =   456.00   CURB HEIGHT(INCHES) =  6.0
   STREET HALFWIDTH(FEET) = 20.00

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

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
   STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =        7.30
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) =  0.48
     HALFSTREET FLOOD WIDTH(FEET) =   18.16
     AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.06
```

```
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.51
 STREET FLOW TRAVEL TIME(MIN.) =   7.17   Tc(MIN.) =   18.50
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.918
 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"        C       2.10     0.25     0.500     69
 COMMERCIAL                  C       0.90     0.25     0.100     69
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.380
 SUBAREA AREA(ACRES) =    3.00      SUBAREA RUNOFF(CFS) =    4.92
 EFFECTIVE AREA(ACRES) =     5.20    AREA-AVERAGED Fm(INCH/HR) =  0.10
 AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.39
 TOTAL AREA(ACRES) =        5.2       PEAK FLOW RATE(CFS) =       8.52

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.50   HALFSTREET FLOOD WIDTH(FEET) = 19.33
 FLOW VELOCITY(FEET/SEC.) =  1.10   DEPTH*VELOCITY(FT*FT/SEC.) =   0.55
 LONGEST FLOWPATH FROM NODE    288.00 TO NODE    290.00 =    786.00 FEET.

 ****************************************************************************
   FLOW PROCESS FROM NODE    290.00 TO NODE    291.00 IS CODE =  62
 --------------------------------------------------------------------------
   >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
 ==========================================================================
  UPSTREAM ELEVATION(FEET) =   43.00  DOWNSTREAM ELEVATION(FEET) =   41.00
  STREET LENGTH(FEET) =   995.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.88
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.52
    HALFSTREET FLOOD WIDTH(FEET) =   20.90
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.54
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =     0.80
 STREET FLOW TRAVEL TIME(MIN.) = 10.80   Tc(MIN.) =   29.30
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.474
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp        Ap      SCS
      LAND USE           GROUP    (ACRES)  (INCH/HR) (DECIMAL)  CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"        C       5.30     0.25     0.500     69
 COMMERCIAL                  C       1.70     0.25     0.100     69
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.403
 SUBAREA AREA(ACRES) =    7.00      SUBAREA RUNOFF(CFS) =    8.65
 EFFECTIVE AREA(ACRES) =     12.20    AREA-AVERAGED Fm(INCH/HR) =  0.10
 AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
```

TOTAL AREA(ACRES) =   12.2   PEAK FLOW RATE(CFS) =   15.09

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.54   HALFSTREET FLOOD WIDTH(FEET) = 21.94
  FLOW VELOCITY(FEET/SEC.) = 1.63   DEPTH*VELOCITY(FT*FT/SEC.) =   0.88
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 995.0 FT WITH ELEVATION-DROP =   2.0 FT, IS   12.2 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   291.00
  LONGEST FLOWPATH FROM NODE   288.00 TO NODE   291.00 =   1781.00 FEET.

  ****
  FLOW PROCESS FROM NODE   291.00 TO NODE   292.00 IS CODE = 62

  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 1 USED)<<<<<
  ==
  UPSTREAM ELEVATION(FEET) =   41.00 DOWNSTREAM ELEVATION(FEET) =   38.00
  STREET LENGTH(FEET) = 2113.00   CURB HEIGHT(INCHES) = 6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   26.34
    STREET FLOWING FULL
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) = 0.66
    HALFSTREET FLOOD WIDTH(FEET) =   28.05
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   1.71
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.13
  STREET FLOW TRAVEL TIME(MIN.) = 20.55   Tc(MIN.) =   49.85
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.087
  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"   C   18.20   0.25   0.500   69
  COMMERCIAL   C   6.80   0.25   0.100   69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.391
  SUBAREA AREA(ACRES) =   25.00   SUBAREA RUNOFF(CFS) =   22.26
  EFFECTIVE AREA(ACRES) =   37.20   AREA-AVERAGED Fm(INCH/HR) = 0.10
  AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.39
  TOTAL AREA(ACRES) =   37.2   PEAK FLOW RATE(CFS) =   33.10

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.71   HALFSTREET FLOOD WIDTH(FEET) = 30.43
  FLOW VELOCITY(FEET/SEC.) = 1.82   DEPTH*VELOCITY(FT*FT/SEC.) =   1.29
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 2113.0 FT WITH ELEVATION-DROP =   3.0 FT, IS   34.9 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   292.00
  LONGEST FLOWPATH FROM NODE   288.00 TO NODE   292.00 =   3894.00 FEET.

  ****

  FLOW PROCESS FROM NODE   292.00 TO NODE   293.00 IS CODE = 62

  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 1 USED)<<<<<
==
  UPSTREAM ELEVATION(FEET) =   38.00 DOWNSTREAM ELEVATION(FEET) =   37.00
  STREET LENGTH(FEET) =   307.00   CURB HEIGHT(INCHES) = 6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   48.55
    STREET FLOWING FULL
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) = 0.70
    HALFSTREET FLOOD WIDTH(FEET) =   30.06
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   2.74
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.92
  STREET FLOW TRAVEL TIME(MIN.) =   1.87   Tc(MIN.) =   51.72
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.064
  SUBAREA LOSS RATE DATA(AMC II):
   DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
       LAND USE   GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"   C   26.60   0.25   0.500   69
  COMMERCIAL   C   9.00   0.25   0.100   69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.399
  SUBAREA AREA(ACRES) =   35.60   SUBAREA RUNOFF(CFS) =   30.90
  EFFECTIVE AREA(ACRES) =   72.80   AREA-AVERAGED Fm(INCH/HR) = 0.10
  AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.40
  TOTAL AREA(ACRES) =   72.8   PEAK FLOW RATE(CFS) =   63.24

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.76   HALFSTREET FLOOD WIDTH(FEET) = 33.11
  FLOW VELOCITY(FEET/SEC.) = 2.93   DEPTH*VELOCITY(FT*FT/SEC.) =   2.23
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L = 307.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   87.2 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   293.00
  LONGEST FLOWPATH FROM NODE   288.00 TO NODE   293.00 =   4201.00 FEET.

****
  FLOW PROCESS FROM NODE   293.00 TO NODE   298.00 IS CODE = 31

  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==
  ELEVATION DATA: UPSTREAM(FEET) =   37.00 DOWNSTREAM(FEET) =   36.00
  FLOW LENGTH(FEET) = 922.00   MANNING'S N = 0.013
  DEPTH OF FLOW IN 57.0 INCH PIPE IS 41.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.53
  ESTIMATED PIPE DIAMETER(INCH) = 57.00   NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =   63.24

```
  PIPE TRAVEL TIME(MIN.) =    3.40    Tc(MIN.) =    55.12
  LONGEST FLOWPATH FROM NODE    288.00 TO NODE    298.00 =    5123.00 FEET.


***************************************************************************
  FLOW PROCESS FROM NODE    298.00 TO NODE    298.00 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.) =   55.12
  RAINFALL INTENSITY(INCH/HR) =   1.03
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25
  AREA-AVERAGED Ap =  0.40
  EFFECTIVE STREAM AREA(ACRES) =       72.80
  TOTAL STREAM AREA(ACRES) =       72.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       63.24


***************************************************************************
  FLOW PROCESS FROM NODE    294.00 TO NODE    295.00 IS CODE =   21
---------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
===========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =     40.00  DOWNSTREAM(FEET) =     39.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.862
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.751
  SUBAREA Tc 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"       C       4.40      0.25      0.500     69   12.62
  COMMERCIAL                 C       1.40      0.25      0.100     69    9.86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.403
  SUBAREA RUNOFF(CFS) =      13.83
  TOTAL AREA(ACRES) =       5.80   PEAK FLOW RATE(CFS) =      13.83


***************************************************************************
  FLOW PROCESS FROM NODE    295.00 TO NODE    296.00 IS CODE =   62
---------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
===========================================================================
  UPSTREAM ELEVATION(FEET) =   39.00  DOWNSTREAM ELEVATION(FEET) =   38.00
  STREET LENGTH(FEET) =   536.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200
```

```
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      21.92
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.60
   HALFSTREET FLOOD WIDTH(FEET) =   25.05
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.80
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.08
 STREET FLOW TRAVEL TIME(MIN.) =   4.97   Tc(MIN.) =   14.83
 *  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
 "5-7 DWELLINGS/ACRE"        C       6.30      0.25     0.500    69
 COMMERCIAL                  C       2.30      0.25     0.100    69
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.393
 SUBAREA AREA(ACRES) =    8.60      SUBAREA RUNOFF(CFS) =   16.09
 EFFECTIVE AREA(ACRES) =     14.40    AREA-AVERAGED Fm(INCH/HR) =  0.10
 AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
 TOTAL AREA(ACRES) =        14.4       PEAK FLOW RATE(CFS) =      26.93

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.64   HALFSTREET FLOOD WIDTH(FEET) =  26.89
 FLOW VELOCITY(FEET/SEC.) =  1.91   DEPTH*VELOCITY(FT*FT/SEC.) =   1.22
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  536.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   17.3 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    296.00
 LONGEST FLOWPATH FROM NODE    294.00 TO NODE    296.00 =     866.00 FEET.

 ****************************************************************************
  FLOW PROCESS FROM NODE    296.00 TO NODE    297.00 IS CODE =  62
 ----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
 ============================================================================
  UPSTREAM ELEVATION(FEET) =   38.00  DOWNSTREAM ELEVATION(FEET) =   36.50
  STREET LENGTH(FEET) = 1133.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      43.14
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.78
    HALFSTREET FLOOD WIDTH(FEET) =   33.97
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.90
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.48
 STREET FLOW TRAVEL TIME(MIN.) =   9.94   Tc(MIN.) =   24.78
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.622
 SUBAREA LOSS RATE DATA(AMC  II):
```

```
                                    GC10EX
    DEVELOPMENT TYPE/      SCS SOIL    AREA      Fp        Ap      SCS
        LAND USE           GROUP    (ACRES)  (INCH/HR) (DECIMAL)  CN
    RESIDENTIAL
    "5-7 DWELLINGS/ACRE"      C       16.90     0.25     0.500    69
    RESIDENTIAL
    "5-7 DWELLINGS/ACRE"      D        0.90     0.20     0.500    75
    COMMERCIAL                C        5.60     0.25     0.100    69
    COMMERCIAL                D        0.10     0.20     0.100    75
    SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
    SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.403
    SUBAREA AREA(ACRES) =   23.50      SUBAREA RUNOFF(CFS) =   32.21
    EFFECTIVE AREA(ACRES) =     37.90    AREA-AVERAGED Fm(INCH/HR) =  0.10
    AREA-AVERAGED Fp(INCH/HR) = 0.25  AREA-AVERAGED Ap =  0.40
    TOTAL AREA(ACRES) =        37.9      PEAK FLOW RATE(CFS) =      51.95

    END OF SUBAREA STREET FLOW HYDRAULICS:
    DEPTH(FEET) = 0.83   HALFSTREET FLOOD WIDTH(FEET) =  36.41
    FLOW VELOCITY(FEET/SEC.) =  1.99   DEPTH*VELOCITY(FT*FT/SEC.) =   1.64
    *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
          AND L = 1133.0 FT WITH ELEVATION-DROP =   1.5 FT, IS   37.8 CFS,
          WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    297.00
    LONGEST FLOWPATH FROM NODE    294.00 TO NODE    297.00 =   1999.00 FEET.

    **************************************************************************
    FLOW PROCESS FROM NODE    297.00 TO NODE    298.00 IS CODE =   31
    --------------------------------------------------------------------------
    >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
    >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
    ==========================================================================
    ELEVATION DATA: UPSTREAM(FEET) =    36.50  DOWNSTREAM(FEET) =    36.00
    FLOW LENGTH(FEET) =   120.00   MANNING'S N =  0.013
    DEPTH OF FLOW IN  42.0 INCH PIPE IS  29.6 INCHES
    PIPE-FLOW VELOCITY(FEET/SEC.) =   7.18
    ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
    PIPE-FLOW(CFS) =        51.95
    PIPE TRAVEL TIME(MIN.) =   0.28    Tc(MIN.) =   25.06
    LONGEST FLOWPATH FROM NODE    294.00 TO NODE    298.00 =   2119.00 FEET.

    **************************************************************************
    FLOW PROCESS FROM NODE    298.00 TO NODE    298.00 IS CODE =    1
    --------------------------------------------------------------------------
    >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
    >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
    ==========================================================================
    TOTAL NUMBER OF STREAMS =  2
    CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
    TIME OF CONCENTRATION(MIN.) =   25.06
    RAINFALL INTENSITY(INCH/HR) =   1.61
    AREA-AVERAGED Fm(INCH/HR) =  0.10
    AREA-AVERAGED Fp(INCH/HR) =  0.25
    AREA-AVERAGED Ap =  0.40
    EFFECTIVE STREAM AREA(ACRES) =      37.90
    TOTAL STREAM AREA(ACRES) =      37.90
    PEAK FLOW RATE(CFS) AT CONFLUENCE =      51.95

    ** CONFLUENCE DATA **
    STREAM       Q     Tc   Intensity  Fp(Fm)      Ap     Ae    HEADWATER
    NUMBER     (CFS) (MIN.) (INCH/HR) (INCH/HR)          (ACRES)   NODE
       1       63.24  55.12   1.026   0.25( 0.10) 0.40     72.8    288.00
       2       51.95  25.06   1.612   0.25( 0.10) 0.40     37.9    294.00
```

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	98.87	25.06	1.612	0.25(0.10)	0.40	71.0	294.00
2	95.06	55.12	1.026	0.25(0.10)	0.40	110.7	288.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =   98.87   Tc(MIN.) =   25.06
EFFECTIVE AREA(ACRES) =   71.00   AREA-AVERAGED Fm(INCH/HR) = 0.10
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.40
TOTAL AREA(ACRES) =   110.7
LONGEST FLOWPATH FROM NODE   288.00 TO NODE   298.00 =   5123.00 FEET.

****
FLOW PROCESS FROM NODE   298.00 TO NODE   303.00 IS CODE = 31

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===
ELEVATION DATA: UPSTREAM(FEET) =   36.00 DOWNSTREAM(FEET) =   35.50
FLOW LENGTH(FEET) =   745.00   MANNING'S N = 0.013
DEPTH OF FLOW IN 72.0 INCH PIPE IS 56.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =   4.19
ESTIMATED PIPE DIAMETER(INCH) = 72.00   NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =   98.87
PIPE TRAVEL TIME(MIN.) =   2.96   Tc(MIN.) =   28.02
LONGEST FLOWPATH FROM NODE   288.00 TO NODE   303.00 =   5868.00 FEET.

****
FLOW PROCESS FROM NODE   303.00 TO NODE   303.00 IS CODE =   1

>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
===
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) =   28.02
RAINFALL INTENSITY(INCH/HR) =   1.51
AREA-AVERAGED Fm(INCH/HR) = 0.10
AREA-AVERAGED Fp(INCH/HR) = 0.25
AREA-AVERAGED Ap = 0.40
EFFECTIVE STREAM AREA(ACRES) =   71.00
TOTAL STREAM AREA(ACRES) =   110.70
PEAK FLOW RATE(CFS) AT CONFLUENCE =   98.87

****
FLOW PROCESS FROM NODE   299.00 TO NODE   300.00 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
===
INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
ELEVATION DATA: UPSTREAM(FEET) =   45.00 DOWNSTREAM(FEET) =   44.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   9.862
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751

```
  SUBAREA Tc 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"      C       3.60     0.25      0.500     69   12.62
   COMMERCIAL               C       2.50     0.25      0.100     69    9.86
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.336
   SUBAREA RUNOFF(CFS) =     14.64
   TOTAL AREA(ACRES) =      6.10   PEAK FLOW RATE(CFS) =     14.64

  *************************************************************************
   FLOW PROCESS FROM NODE    300.00 TO NODE    301.00 IS CODE =  62
  --------------------------------------------------------------------------
   >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
  ==========================================================================
   UPSTREAM ELEVATION(FEET) =   44.00  DOWNSTREAM ELEVATION(FEET) =   42.00
   STREET LENGTH(FEET) =   885.00   CURB HEIGHT(INCHES) =  6.0
   STREET HALFWIDTH(FEET) = 20.00

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

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
   STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      32.13
     ***STREET FLOWING FULL***
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) =  0.65
     HALFSTREET FLOOD WIDTH(FEET) =   27.68
     AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.15
     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.40
   STREET FLOW TRAVEL TIME(MIN.) =   6.87   Tc(MIN.) =   16.73
   *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.032
   SUBAREA LOSS RATE DATA(AMC  II):
    DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
        LAND USE           GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
    RESIDENTIAL
    "5-7 DWELLINGS/ACRE"      C      13.10     0.25      0.500     69
    COMMERCIAL               C       6.70     0.25      0.100     69
    SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
    SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.365
    SUBAREA AREA(ACRES) =   19.80      SUBAREA RUNOFF(CFS) =   34.58
    EFFECTIVE AREA(ACRES) =    25.90    AREA-AVERAGED Fm(INCH/HR) =  0.09
    AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.36
    TOTAL AREA(ACRES) =       25.9       PEAK FLOW RATE(CFS) =     45.27

    END OF SUBAREA STREET FLOW HYDRAULICS:
    DEPTH(FEET) = 0.73   HALFSTREET FLOOD WIDTH(FEET) =  31.34
    FLOW VELOCITY(FEET/SEC.) =  2.35   DEPTH*VELOCITY(FT*FT/SEC.) =   1.71
    *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
          AND L =  885.0 FT WITH ELEVATION-DROP =   2.0 FT, IS   36.2 CFS,
           WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    301.00
   LONGEST FLOWPATH FROM NODE    299.00 TO NODE    301.00 =    1215.00 FEET.
```

```
***********************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    302.00 IS CODE =  62
-----------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
=======================================================================
  UPSTREAM ELEVATION(FEET) =   42.00  DOWNSTREAM ELEVATION(FEET) =   37.00
  STREET LENGTH(FEET) = 1530.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      68.65
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.78
    HALFSTREET FLOOD WIDTH(FEET) =   34.15
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.99
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.34
  STREET FLOW TRAVEL TIME(MIN.) =   8.53   Tc(MIN.) =   25.26
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.605
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp        Ap     SCS
       LAND USE          GROUP   (ACRES)  (INCH/HR) (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       C       8.30      0.25     0.500    69
  COMMERCIAL                 D      11.60      0.20     0.100    75
  URBAN POOR COVER
  "TURF"                     C       0.70      0.25     1.000    83
  URBAN POOR COVER
  "TURF"                     D       1.90      0.20     1.000    87
  SCHOOL                     C       7.20      0.25     0.600    69
  SCHOOL                     D       4.70      0.20     0.600    75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.23
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.437
  SUBAREA AREA(ACRES) =   34.40      SUBAREA RUNOFF(CFS) =   46.55
  EFFECTIVE AREA(ACRES) =    60.30    AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.24  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =      60.3       PEAK FLOW RATE(CFS) =      81.87

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.83   HALFSTREET FLOOD WIDTH(FEET) =  36.47
  FLOW VELOCITY(FEET/SEC.) =  3.12   DEPTH*VELOCITY(FT*FT/SEC.) =   2.59
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1530.0 FT WITH ELEVATION-DROP =   5.0 FT, IS   57.3 CFS,
          WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    302.00
  LONGEST FLOWPATH FROM NODE    299.00 TO NODE    302.00 =    2745.00 FEET.

***********************************************************************
  FLOW PROCESS FROM NODE    302.00 TO NODE    303.00 IS CODE =  31
-----------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    37.00  DOWNSTREAM(FEET) =    35.50
  FLOW LENGTH(FEET) =    84.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  28.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 13.63
  ESTIMATED PIPE DIAMETER(INCH) = 36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       81.87
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =   25.37
  LONGEST FLOWPATH FROM NODE    299.00 TO NODE    303.00 =    2829.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    303.00 TO NODE    303.00 IS CODE =   1
--------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   25.37
  RAINFALL INTENSITY(INCH/HR) =   1.60
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.24
  AREA-AVERAGED Ap =  0.40
  EFFECTIVE STREAM AREA(ACRES) =      60.30
  TOTAL STREAM AREA(ACRES) =      60.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      81.87

  ** CONFLUENCE DATA **
  STREAM      Q     Tc    Intensity   Fp(Fm)      Ap      Ae     HEADWATER
  NUMBER    (CFS) (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      98.87  28.02    1.512   0.25( 0.10) 0.40     71.0    294.00
     1      95.06  58.09    0.996   0.25( 0.10) 0.40    110.7    288.00
     2      81.87  25.37    1.601   0.24( 0.10) 0.40     60.3    299.00

  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     176.99  25.37    1.601   0.24( 0.10) 0.40    124.6    299.00
     2     175.91  28.02    1.512   0.24( 0.10) 0.40    131.3    294.00
     3     144.02  58.09    0.996   0.25( 0.10) 0.40    171.0    288.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      176.99    Tc(MIN.) =     25.37
  EFFECTIVE AREA(ACRES) =     124.57   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.24  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =       171.0
  LONGEST FLOWPATH FROM NODE    288.00 TO NODE    303.00 =    5868.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    303.00 TO NODE    304.00 IS CODE =  31
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    35.50  DOWNSTREAM(FEET) =    35.00
  FLOW LENGTH(FEET) = 1880.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN 108.0 INCH PIPE IS  81.3 INCHES
```

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.44
  ESTIMATED PIPE DIAMETER(INCH) = 108.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      176.99
  PIPE TRAVEL TIME(MIN.) =   9.10    Tc(MIN.) =   34.47
  LONGEST FLOWPATH FROM NODE    288.00 TO NODE    304.00 =    7748.00 FEET.


****************************************************************************
  FLOW PROCESS FROM NODE    304.00 TO NODE    304.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   34.47
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.343
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/     SCS SOIL   AREA     Fp        Ap      SCS
       LAND USE          GROUP    (ACRES)  (INCH/HR) (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"      C       0.40     0.25      0.500    69
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"      D      22.30     0.20      0.500    75
  COMMERCIAL                C       0.10     0.25      0.100    69
  COMMERCIAL                D      12.40     0.20      0.100    75
  URBAN POOR COVER
  "TURF"                    D       1.70     0.20      1.000    87
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.388
  SUBAREA AREA(ACRES) =   36.90      SUBAREA RUNOFF(CFS) =   42.02
  EFFECTIVE AREA(ACRES) =    161.47   AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.23  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =       207.9      PEAK FLOW RATE(CFS) =     181.63


****************************************************************************
  FLOW PROCESS FROM NODE    305.00 TO NODE    306.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =     38.00  DOWNSTREAM(FEET) =     36.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.586
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.978
  SUBAREA Tc 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"      D       1.20     0.20      0.500    75   10.99
  COMMERCIAL                D       0.30     0.20      0.100    75    8.59
  URBAN POOR COVER
  "TURF"                    D       0.60     0.20      1.000    87   14.83
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.586
  SUBAREA RUNOFF(CFS) =      5.41
  TOTAL AREA(ACRES) =      2.10   PEAK FLOW RATE(CFS) =      5.41


****************************************************************************
  FLOW PROCESS FROM NODE    306.00 TO NODE    307.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =   36.00  DOWNSTREAM ELEVATION(FEET) =    34.00
  STREET LENGTH(FEET) =   826.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.04
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.53
    HALFSTREET FLOOD WIDTH(FEET) =   21.70
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.77
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.95
  STREET FLOW TRAVEL TIME(MIN.) =   7.78   Tc(MIN.) =   16.36
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.058
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA       Fp         Ap     SCS
       LAND USE           GROUP    (ACRES)   (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       D       8.20      0.20      0.500    75
  COMMERCIAL                 D       3.00      0.20      0.100    75
  URBAN POOR COVER
  "TURF"                     D       0.50      0.20      1.000    87
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.419
  SUBAREA AREA(ACRES) =   11.70      SUBAREA RUNOFF(CFS) =   20.79
  EFFECTIVE AREA(ACRES) =     13.80    AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.44
  TOTAL AREA(ACRES) =       13.8        PEAK FLOW RATE(CFS) =      24.46

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.60   HALFSTREET FLOOD WIDTH(FEET) =  24.87
  FLOW VELOCITY(FEET/SEC.) =  2.04   DEPTH*VELOCITY(FT*FT/SEC.) =   1.22
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  826.0 FT WITH ELEVATION-DROP =   2.0 FT, IS   22.0 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    307.00
  LONGEST FLOWPATH FROM NODE    305.00 TO NODE    307.00 =   1156.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    307.00 TO NODE    308.00 IS CODE =  62
--------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =   34.00  DOWNSTREAM ELEVATION(FEET) =    33.00
  STREET LENGTH(FEET) =   405.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   32.22
  STREET FLOWING FULL
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) = 0.65
  HALFSTREET FLOOD WIDTH(FEET) =   27.31
  AVERAGE FLOW VELOCITY(FEET/SEC.) =   2.21
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.43
STREET FLOW TRAVEL TIME(MIN.) =   3.05   Tc(MIN.) =   19.41
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.866
SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
     LAND USE   GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
RESIDENTIAL
"5-7 DWELLINGS/ACRE"   D   4.90   0.20   0.500   75
COMMERCIAL   D   4.20   0.20   0.100   75
URBAN POOR COVER
"TURF"   D   0.50   0.20   1.000   87
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.351
SUBAREA AREA(ACRES) =   9.60   SUBAREA RUNOFF(CFS) =   15.52
EFFECTIVE AREA(ACRES) =   23.40   AREA-AVERAGED Fm(INCH/HR) = 0.08
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.41
TOTAL AREA(ACRES) =   23.4   PEAK FLOW RATE(CFS) =   37.59

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.68   HALFSTREET FLOOD WIDTH(FEET) = 28.84
FLOW VELOCITY(FEET/SEC.) = 2.31   DEPTH*VELOCITY(FT*FT/SEC.) =   1.56
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 405.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   21.5 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   308.00
LONGEST FLOWPATH FROM NODE   305.00 TO NODE   308.00 =   1561.00 FEET.

****
 FLOW PROCESS FROM NODE   308.00 TO NODE   309.00 IS CODE = 31

 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===
 ELEVATION DATA: UPSTREAM(FEET) =   33.00 DOWNSTREAM(FEET) =   32.50
 FLOW LENGTH(FEET) =   449.00   MANNING'S N = 0.013
 DEPTH OF FLOW IN 45.0 INCH PIPE IS 36.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.95
 ESTIMATED PIPE DIAMETER(INCH) = 45.00   NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =   37.59
 PIPE TRAVEL TIME(MIN.) =   1.89   Tc(MIN.) =   21.31
 LONGEST FLOWPATH FROM NODE   305.00 TO NODE   309.00 =   2010.00 FEET.

****
 FLOW PROCESS FROM NODE   309.00 TO NODE   309.00 IS CODE = 81

 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===
 MAINLINE Tc(MIN.) =   21.31
 * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.769

```
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp        Ap     SCS
       LAND USE           GROUP    (ACRES)  (INCH/HR) (DECIMAL)  CN
   RESIDENTIAL
   "5-7 DWELLINGS/ACRE"      D       3.10     0.20     0.500     75
   COMMERCIAL                D       1.20     0.20     0.100     75
   URBAN POOR COVER
   "TURF"                    D       7.60     0.20     1.000     87
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.779
   SUBAREA AREA(ACRES) =   11.90      SUBAREA RUNOFF(CFS) =   17.28
   EFFECTIVE AREA(ACRES) =     35.30   AREA-AVERAGED Fm(INCH/HR) =  0.11
   AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.53
   TOTAL AREA(ACRES) =        35.3      PEAK FLOW RATE(CFS) =     52.82

****************************************************************************
  FLOW PROCESS FROM NODE    310.00 TO NODE    311.00 IS CODE =  21
---------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
===========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =     45.00  DOWNSTREAM(FEET) =     44.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.862
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.751
  SUBAREA Tc 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"      C       1.40     0.25     0.500     69   12.62
   COMMERCIAL                C       0.70     0.25     0.100     69    9.86
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.367
   SUBAREA RUNOFF(CFS) =      5.03
   TOTAL AREA(ACRES) =       2.10   PEAK FLOW RATE(CFS) =      5.03

****************************************************************************
  FLOW PROCESS FROM NODE    311.00 TO NODE    312.00 IS CODE =  62
---------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
===========================================================================
  UPSTREAM ELEVATION(FEET) =   44.00  DOWNSTREAM ELEVATION(FEET) =   42.00
  STREET LENGTH(FEET) =   587.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.90
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.47
```

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HALFSTREET FLOOD WIDTH(FEET) =   17.62
AVERAGE FLOW VELOCITY(FEET/SEC.) =   1.83
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   0.86
STREET FLOW TRAVEL TIME(MIN.) =   5.35   Tc(MIN.) =   15.21
* 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"   C   5.40   0.25   0.500   69
COMMERCIAL   C   2.00   0.25   0.100   69
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.392
SUBAREA AREA(ACRES) =   7.40   SUBAREA RUNOFF(CFS) =   13.64
EFFECTIVE AREA(ACRES) =   9.50   AREA-AVERAGED Fm(INCH/HR) = 0.10
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.39
TOTAL AREA(ACRES) =   9.5   PEAK FLOW RATE(CFS) =   17.52

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.52   HALFSTREET FLOOD WIDTH(FEET) = 21.21
FLOW VELOCITY(FEET/SEC.) = 2.03   DEPTH*VELOCITY(FT*FT/SEC.) =   1.06
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 587.0 FT WITH ELEVATION-DROP =   2.0 FT, IS   15.6 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   312.00
LONGEST FLOWPATH FROM NODE   310.00 TO NODE   312.00 =   917.00 FEET.

****
 FLOW PROCESS FROM NODE   312.00 TO NODE   313.00 IS CODE = 62

 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION # 1 USED)<<<<<
==
 UPSTREAM ELEVATION(FEET) =   42.00 DOWNSTREAM ELEVATION(FEET) =   40.00
 STREET LENGTH(FEET) = 1008.00   CURB HEIGHT(INCHES) = 6.0
 STREET HALFWIDTH(FEET) = 20.00

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   28.35
   STREET FLOWING FULL
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) = 0.64
   HALFSTREET FLOOD WIDTH(FEET) =   27.13
   AVERAGE FLOW VELOCITY(FEET/SEC.) =   1.97
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.27
STREET FLOW TRAVEL TIME(MIN.) =   8.51   Tc(MIN.) =   23.72
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.664
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"   C   7.90   0.25   0.500   69
RESIDENTIAL

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"5-7 DWELLINGS/ACRE"          D       1.80      0.20     0.500     75
COMMERCIAL                    C       2.30      0.25     0.100     69
COMMERCIAL                    D       0.60      0.20     0.100     75
SCHOOL                        D       2.70      0.20     0.600     75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.23
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.442
SUBAREA AREA(ACRES) =   15.30      SUBAREA RUNOFF(CFS) =    21.50
EFFECTIVE AREA(ACRES) =      24.80    AREA-AVERAGED Fm(INCH/HR) =  0.10
AREA-AVERAGED Fp(INCH/HR) =  0.24  AREA-AVERAGED Ap =  0.42
TOTAL AREA(ACRES) =       24.8        PEAK FLOW RATE(CFS) =      34.90

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.68   HALFSTREET FLOOD WIDTH(FEET) = 29.21
FLOW VELOCITY(FEET/SEC.) = 2.09   DEPTH*VELOCITY(FT*FT/SEC.) =   1.43
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 1008.0 FT WITH ELEVATION-DROP =   2.0 FT, IS   26.5 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    313.00
LONGEST FLOWPATH FROM NODE    310.00 TO NODE    313.00 =   1925.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    313.00 TO NODE    314.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =   40.00  DOWNSTREAM ELEVATION(FEET) =   38.00
  STREET LENGTH(FEET) =   265.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      46.87
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.61
    HALFSTREET FLOOD WIDTH(FEET) =   25.60
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.67
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.25
  STREET FLOW TRAVEL TIME(MIN.) =   1.20   Tc(MIN.) =   24.92
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.617
  SUBAREA LOSS RATE DATA(AMC  II):
```

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	7.60	0.25	0.500	69
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	D	1.80	0.20	0.500	75
COMMERCIAL	D	3.80	0.20	0.100	75
URBAN POOR COVER					
"TURF"	D	1.70	0.20	1.000	87
SCHOOL	D	2.70	0.20	0.600	75

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.22
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.477
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  SUBAREA AREA(ACRES) =   17.60       SUBAREA RUNOFF(CFS) =   23.93
  EFFECTIVE AREA(ACRES) =      42.40    AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.23  AREA-AVERAGED Ap =  0.44
  TOTAL AREA(ACRES) =        42.4       PEAK FLOW RATE(CFS) =      57.80

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.65   HALFSTREET FLOOD WIDTH(FEET) =  27.56
  FLOW VELOCITY(FEET/SEC.) =  3.90   DEPTH*VELOCITY(FT*FT/SEC.) =   2.54
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  265.0 FT WITH ELEVATION-DROP =   2.0 FT, IS   49.2 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    314.00
  LONGEST FLOWPATH FROM NODE    310.00 TO NODE    314.00 =   2190.00 FEET.

  **************************************************************************
  FLOW PROCESS FROM NODE    314.00 TO NODE    315.00 IS CODE =  31
  --------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
  ==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     38.00  DOWNSTREAM(FEET) =     37.00
  FLOW LENGTH(FEET) =   195.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  29.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.97
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      57.80
  PIPE TRAVEL TIME(MIN.) =   0.41    Tc(MIN.) =   25.33
  LONGEST FLOWPATH FROM NODE    310.00 TO NODE    315.00 =   2385.00 FEET.

  **************************************************************************
  FLOW PROCESS FROM NODE    316.00 TO NODE    317.00 IS CODE =  21
  --------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
  ==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =     46.00  DOWNSTREAM(FEET) =     44.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.586
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.978
  SUBAREA Tc 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"       C       3.10      0.25      0.500    69    10.99
  COMMERCIAL                 C       6.20      0.25      0.100    69     8.59
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.233
  SUBAREA RUNOFF(CFS) =      24.44
  TOTAL AREA(ACRES) =       9.30   PEAK FLOW RATE(CFS) =     24.44

  **************************************************************************
  FLOW PROCESS FROM NODE    317.00 TO NODE    318.00 IS CODE =  62
  --------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  3 USED)<<<<<
  ==========================================================================
  UPSTREAM ELEVATION(FEET) =   44.00  DOWNSTREAM ELEVATION(FEET) =    42.00
  STREET LENGTH(FEET) =   913.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 51.00
```

    DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 25.00
    INSIDE STREET CROSSFALL(DECIMAL) = 0.020
    OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

    SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
    STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
    Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
    Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

      **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   44.52
      STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
      STREET FLOW DEPTH(FEET) = 0.79
      HALFSTREET FLOOD WIDTH(FEET) =   38.01
      AVERAGE FLOW VELOCITY(FEET/SEC.) =   2.09
      PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.66
    STREET FLOW TRAVEL TIME(MIN.) =   7.28   Tc(MIN.) =   15.86
    * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.095
    SUBAREA LOSS RATE DATA(AMC II):
     DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
         LAND USE   GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
    RESIDENTIAL
    "5-7 DWELLINGS/ACRE"   C   0.20   0.25   0.500   69
    COMMERCIAL   C   21.20   0.25   0.100   69
    SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
    SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.104
    SUBAREA AREA(ACRES) =   21.40   SUBAREA RUNOFF(CFS) =   39.85
    EFFECTIVE AREA(ACRES) =   30.70   AREA-AVERAGED Fm(INCH/HR) = 0.04
    AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.14
    TOTAL AREA(ACRES) =   30.7   PEAK FLOW RATE(CFS) =   56.90

    END OF SUBAREA STREET FLOW HYDRAULICS:
    DEPTH(FEET) = 0.85   HALFSTREET FLOOD WIDTH(FEET) = 43.67
    FLOW VELOCITY(FEET/SEC.) = 2.20   DEPTH*VELOCITY(FT*FT/SEC.) =   1.86
    *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
          AND L = 913.0 FT WITH ELEVATION-DROP =   2.0 FT, IS   39.9 CFS,
          WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   318.00
    LONGEST FLOWPATH FROM NODE   316.00 TO NODE   318.00 =   1243.00 FEET.

    ****
      FLOW PROCESS FROM NODE   318.00 TO NODE   319.00 IS CODE = 62

      >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
      >>>>>(STREET TABLE SECTION # 3 USED)<<<<<
    ==
      UPSTREAM ELEVATION(FEET) =   42.00 DOWNSTREAM ELEVATION(FEET) =   39.00
      STREET LENGTH(FEET) = 1068.00   CURB HEIGHT(INCHES) = 8.0
      STREET HALFWIDTH(FEET) = 51.00

      DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 25.00
      INSIDE STREET CROSSFALL(DECIMAL) = 0.020
      OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

      SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
      STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
      Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
      Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

        **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   74.20
        STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:

```
   STREET FLOW DEPTH(FEET) =  0.88
   HALFSTREET FLOOD WIDTH(FEET) =   47.19
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.55
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.25
STREET FLOW TRAVEL TIME(MIN.) =   6.98   Tc(MIN.) =   22.84
* 10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.700
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"        C       1.30     0.25     0.500     69
COMMERCIAL                  C      20.90     0.25     0.100     69
COMMERCIAL                  D       0.80     0.20     0.100     75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.123
SUBAREA AREA(ACRES) =   23.00      SUBAREA RUNOFF(CFS) =   34.56
EFFECTIVE AREA(ACRES) =     53.70    AREA-AVERAGED Fm(INCH/HR) =  0.03
AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.13
TOTAL AREA(ACRES) =        53.7        PEAK FLOW RATE(CFS) =      80.54

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.91   HALFSTREET FLOOD WIDTH(FEET) = 49.33
FLOW VELOCITY(FEET/SEC.) =  2.58   DEPTH*VELOCITY(FT*FT/SEC.) =   2.34
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 1068.0 FT WITH ELEVATION-DROP =   3.0 FT, IS   42.5 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    319.00
LONGEST FLOWPATH FROM NODE    316.00 TO NODE    319.00 =   2311.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    319.00 TO NODE    320.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  3 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =   39.00  DOWNSTREAM ELEVATION(FEET) =   34.00
  STREET LENGTH(FEET) = 1732.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 51.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  25.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     100.45
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.96
    HALFSTREET FLOOD WIDTH(FEET) =   54.80
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.72
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.62
STREET FLOW TRAVEL TIME(MIN.) =  10.60   Tc(MIN.) =   33.44
* 10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.366
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
     LAND USE          GROUP    (ACRES)  (INCH/HR) (DECIMAL)  CN
RESIDENTIAL
"5-7 DWELLINGS/ACRE"        C       1.70     0.25     0.500     69
```

```
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"        D       5.90      0.20      0.500     75
 COMMERCIAL                  C       2.10      0.25      0.100     69
 COMMERCIAL                  D      23.60      0.20      0.100     75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.21
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.191
 SUBAREA AREA(ACRES) =   33.30      SUBAREA RUNOFF(CFS) =   39.76
 EFFECTIVE AREA(ACRES) =     87.00    AREA-AVERAGED Fm(INCH/HR) =  0.04
 AREA-AVERAGED Fp(INCH/HR) =  0.23  AREA-AVERAGED Ap =  0.16
 TOTAL AREA(ACRES) =        87.0        PEAK FLOW RATE(CFS) =    104.18

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.97   HALFSTREET FLOOD WIDTH(FEET) =  55.78
 FLOW VELOCITY(FEET/SEC.) =  2.74   DEPTH*VELOCITY(FT*FT/SEC.) =   2.66
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L = 1732.0 FT WITH ELEVATION-DROP =   5.0 FT, IS   54.9 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   320.00
 LONGEST FLOWPATH FROM NODE    316.00 TO NODE    320.00 =   4043.00 FEET.

*************************************************************************
  FLOW PROCESS FROM NODE    320.00 TO NODE    321.00 IS CODE =  31
-------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
=========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    34.00  DOWNSTREAM(FEET) =    33.00
  FLOW LENGTH(FEET) =   545.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  60.0 INCH PIPE IS  48.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.14
  ESTIMATED PIPE DIAMETER(INCH) =  60.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      104.18
  PIPE TRAVEL TIME(MIN.) =   1.48    Tc(MIN.) =   34.92
  LONGEST FLOWPATH FROM NODE    316.00 TO NODE    321.00 =   4588.00 FEET.

*************************************************************************
  FLOW PROCESS FROM NODE    321.00 TO NODE    321.00 IS CODE =   1
-------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
=========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   34.92
  RAINFALL INTENSITY(INCH/HR) =   1.33
  AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.23
  AREA-AVERAGED Ap =  0.16
  EFFECTIVE STREAM AREA(ACRES) =     87.00
  TOTAL STREAM AREA(ACRES) =     87.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     104.18

*************************************************************************
  FLOW PROCESS FROM NODE    321.00 TO NODE    322.00 IS CODE =  21
-------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
=========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =     42.00  DOWNSTREAM(FEET) =    40.00

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

```
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.986
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.586
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp        Ap     SCS   Tc
        LAND USE           GROUP   (ACRES)  (INCH/HR) (DECIMAL)  CN  (MIN.)
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       C       3.70     0.25     0.500     69   10.99
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       D       0.10     0.20     0.500     75   10.99
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.500
  SUBAREA RUNOFF(CFS) =      8.42
  TOTAL AREA(ACRES) =      3.80   PEAK FLOW RATE(CFS) =       8.42

***************************************************************************
  FLOW PROCESS FROM NODE    322.00 TO NODE    323.00 IS CODE =  62
---------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
===========================================================================
  UPSTREAM ELEVATION(FEET) =   40.00  DOWNSTREAM ELEVATION(FEET) =   38.00
  STREET LENGTH(FEET) =  1467.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.38
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.60
    HALFSTREET FLOOD WIDTH(FEET) =   24.93
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.52
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.91
  STREET FLOW TRAVEL TIME(MIN.) = 16.07   Tc(MIN.) =   27.06
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.543
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp        Ap     SCS
        LAND USE           GROUP   (ACRES)  (INCH/HR) (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       C       3.20     0.25     0.500     69
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       D       7.60     0.20     0.500     75
  COMMERCIAL                 C       1.00     0.25     0.100     69
  COMMERCIAL                 D       2.90     0.20     0.100     75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.21
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.394
  SUBAREA AREA(ACRES) =   14.70      SUBAREA RUNOFF(CFS) =   19.29
  EFFECTIVE AREA(ACRES) =     18.50    AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.22  AREA-AVERAGED Ap =  0.42
  TOTAL AREA(ACRES) =      18.5       PEAK FLOW RATE(CFS) =      24.14

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.65   HALFSTREET FLOOD WIDTH(FEET) = 27.37
```

```
  FLOW VELOCITY(FEET/SEC.) =  1.65   DEPTH*VELOCITY(FT*FT/SEC.) =   1.07
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1467.0 FT WITH ELEVATION-DROP =   2.0 FT, IS   22.5 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    323.00
  LONGEST FLOWPATH FROM NODE    321.00 TO NODE    323.00 =    1797.00 FEET.

 **************************************************************************
   FLOW PROCESS FROM NODE    323.00 TO NODE    324.00 IS CODE =  62
 --------------------------------------------------------------------------
   >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
 ==========================================================================
   UPSTREAM ELEVATION(FEET) =   38.00  DOWNSTREAM ELEVATION(FEET) =   33.00
   STREET LENGTH(FEET) = 1382.00   CURB HEIGHT(INCHES) =  6.0
   STREET HALFWIDTH(FEET) = 20.00

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

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
   STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      37.97
     ***STREET FLOWING FULL***
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) =  0.64
     HALFSTREET FLOOD WIDTH(FEET) =   27.01
     AVERAGE FLOW VELOCITY(FEET/SEC.) =     2.67
     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.71
   STREET FLOW TRAVEL TIME(MIN.) =   8.63   Tc(MIN.) =   35.69
   *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.316
   SUBAREA LOSS RATE DATA(AMC  II):
    DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap     SCS
        LAND USE           GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
   RESIDENTIAL
   "5-7 DWELLINGS/ACRE"       D       12.70     0.20      0.500     75
   COMMERCIAL                 D        5.90     0.20      0.100     75
   URBAN POOR COVER
   "TURF"                     D        1.30     0.20      1.000     87
   SCHOOL                     D        5.10     0.20      0.600     75
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.452
   SUBAREA AREA(ACRES) =   25.00      SUBAREA RUNOFF(CFS) =   27.58
   EFFECTIVE AREA(ACRES) =    43.50    AREA-AVERAGED Fm(INCH/HR) =  0.09
   AREA-AVERAGED Fp(INCH/HR) =  0.21  AREA-AVERAGED Ap =  0.44
   TOTAL AREA(ACRES) =      43.5        PEAK FLOW RATE(CFS) =     47.96

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 0.69   HALFSTREET FLOOD WIDTH(FEET) =  29.39
   FLOW VELOCITY(FEET/SEC.) =  2.83   DEPTH*VELOCITY(FT*FT/SEC.) =   1.95
   *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
          AND L = 1382.0 FT WITH ELEVATION-DROP =   5.0 FT, IS   43.5 CFS,
          WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    324.00
   LONGEST FLOWPATH FROM NODE    321.00 TO NODE    324.00 =    3179.00 FEET.

 **************************************************************************
   FLOW PROCESS FROM NODE    324.00 TO NODE    324.00 IS CODE =   1
```

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--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   35.69
  RAINFALL INTENSITY(INCH/HR) =   1.32
  AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.21
  AREA-AVERAGED Ap =  0.44
  EFFECTIVE STREAM AREA(ACRES) =      43.50
  TOTAL STREAM AREA(ACRES) =      43.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       47.96

  ** CONFLUENCE DATA **
  STREAM      Q      Tc    Intensity  Fp(Fm)      Ap      Ae     HEADWATER
  NUMBER    (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)   NODE
     1     104.18   34.92    1.333  0.23( 0.04) 0.16     87.0    316.00
     2      47.96   35.69    1.316  0.21( 0.09) 0.44     43.5    321.00

  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     151.73   34.92    1.333  0.22( 0.05) 0.25    129.6    316.00
     2     150.80   35.69    1.316  0.22( 0.05) 0.25    130.5    321.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      151.73    Tc(MIN.) =    34.92
  EFFECTIVE AREA(ACRES) =     129.56   AREA-AVERAGED Fm(INCH/HR) =  0.05
  AREA-AVERAGED Fp(INCH/HR) =  0.22  AREA-AVERAGED Ap =  0.25
  TOTAL AREA(ACRES) =       130.5
  LONGEST FLOWPATH FROM NODE    316.00 TO NODE    324.00 =   4588.00 FEET.

***************************************************************************
  FLOW PROCESS FROM NODE    324.00 TO NODE    325.00 IS CODE =  31
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    33.00  DOWNSTREAM(FEET) =    32.50
  FLOW LENGTH(FEET) =   167.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  63.0 INCH PIPE IS  50.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.11
  ESTIMATED PIPE DIAMETER(INCH) =  63.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      151.73
  PIPE TRAVEL TIME(MIN.) =   0.34    Tc(MIN.) =   35.26
  LONGEST FLOWPATH FROM NODE    316.00 TO NODE    325.00 =   4755.00 FEET.

***************************************************************************
  FLOW PROCESS FROM NODE    326.00 TO NODE    327.00 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    330.00
  ELEVATION DATA: UPSTREAM(FEET) =      38.00  DOWNSTREAM(FEET) =     36.00
```

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.586
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.978
  SUBAREA Tc 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"       D       1.60     0.20      0.500     75   10.99
  COMMERCIAL                 D       0.50     0.20      0.100     75    8.59
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.405
  SUBAREA RUNOFF(CFS) =      5.48
  TOTAL AREA(ACRES) =      2.10   PEAK FLOW RATE(CFS) =      5.48

****************************************************************************
  FLOW PROCESS FROM NODE    327.00 TO NODE    328.00 IS CODE =  62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =   36.00  DOWNSTREAM ELEVATION(FEET) =   34.00
  STREET LENGTH(FEET) =   607.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.13
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.46
    HALFSTREET FLOOD WIDTH(FEET) =   17.23
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.79
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.82
  STREET FLOW TRAVEL TIME(MIN.) =   5.67   Tc(MIN.) =   14.25
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.228
  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"       D       3.70     0.20      0.500     75
  COMMERCIAL                 D       1.70     0.20      0.100     75
  URBAN POOR COVER
  "TURF"                     D       0.40     0.20      1.000     87
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.417
  SUBAREA AREA(ACRES) =    5.80      SUBAREA RUNOFF(CFS) =   11.19
  EFFECTIVE AREA(ACRES) =      7.90    AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.41
  TOTAL AREA(ACRES) =      7.9       PEAK FLOW RATE(CFS) =      15.25

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.51   HALFSTREET FLOOD WIDTH(FEET) = 19.80
  FLOW VELOCITY(FEET/SEC.) = 1.93   DEPTH*VELOCITY(FT*FT/SEC.) =   0.98
```

LONGEST FLOWPATH FROM NODE   326.00 TO NODE   328.00 =   937.00 FEET.

****
  FLOW PROCESS FROM NODE   328.00 TO NODE   329.00 IS CODE =   31

  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==
  ELEVATION DATA: UPSTREAM(FEET) =   34.00 DOWNSTREAM(FEET) =   33.00
  FLOW LENGTH(FEET) =   190.00   MANNING'S N = 0.013
  DEPTH OF FLOW IN 24.0 INCH PIPE IS 19.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.65
  ESTIMATED PIPE DIAMETER(INCH) = 24.00   NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =   15.25
  PIPE TRAVEL TIME(MIN.) =   0.56   Tc(MIN.) =   14.81
  LONGEST FLOWPATH FROM NODE   326.00 TO NODE   329.00 =   1127.00 FEET.

****
  FLOW PROCESS FROM NODE   330.00 TO NODE   331.00 IS CODE =   21

  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =   34.00 DOWNSTREAM(FEET) =   33.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   9.862
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751
  SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	D	1.40	0.20	0.500	75	12.62
COMMERCIAL	D	0.50	0.20	0.100	75	9.86

  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.395
  SUBAREA RUNOFF(CFS) =   4.57
  TOTAL AREA(ACRES) =   1.90   PEAK FLOW RATE(CFS) =   4.57

****
  FLOW PROCESS FROM NODE   331.00 TO NODE   332.00 IS CODE =   62

  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 1 USED)<<<<<
==
  UPSTREAM ELEVATION(FEET) =   33.00 DOWNSTREAM ELEVATION(FEET) =   32.50
  STREET LENGTH(FEET) =   80.00   CURB HEIGHT(INCHES) = 6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   10.95

```
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.42
   HALFSTREET FLOOD WIDTH(FEET) =   15.04
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.27
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.95
 STREET FLOW TRAVEL TIME(MIN.) =   0.59   Tc(MIN.) =   10.45
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.661
 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"       D       4.20     0.20      0.500     75
 COMMERCIAL                 D       1.30     0.20      0.100     75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.405
 SUBAREA AREA(ACRES) =    5.50      SUBAREA RUNOFF(CFS) =   12.77
 EFFECTIVE AREA(ACRES) =      7.40    AREA-AVERAGED Fm(INCH/HR) =  0.08
 AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.40
 TOTAL AREA(ACRES) =        7.4        PEAK FLOW RATE(CFS) =     17.19

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.48   HALFSTREET FLOOD WIDTH(FEET) =  18.01
 FLOW VELOCITY(FEET/SEC.) =  2.53   DEPTH*VELOCITY(FT*FT/SEC.) =   1.21
 LONGEST FLOWPATH FROM NODE    330.00 TO NODE    332.00 =     410.00 FEET.

 **************************************************************************
   FLOW PROCESS FROM NODE    332.00 TO NODE    333.00 IS CODE =  31
 --------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
 ==========================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    32.50  DOWNSTREAM(FEET) =    32.00
   FLOW LENGTH(FEET) =    451.00   MANNING'S N =  0.013
   DEPTH OF FLOW IN  36.0 INCH PIPE IS  24.7 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) =   3.32
   ESTIMATED PIPE DIAMETER(INCH) = 36.00    NUMBER OF PIPES =   1
   PIPE-FLOW(CFS) =       17.19
   PIPE TRAVEL TIME(MIN.) =   2.26    Tc(MIN.) =   12.71
   LONGEST FLOWPATH FROM NODE    330.00 TO NODE    333.00 =     861.00 FEET.

 **************************************************************************
   FLOW PROCESS FROM NODE    333.00 TO NODE    333.00 IS CODE =  81
 --------------------------------------------------------------------------
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
 ==========================================================================
   MAINLINE Tc(MIN.) =   12.71
   *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.378
   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"       D       2.90     0.20      0.500     75
   COMMERCIAL                 D       0.90     0.20      0.100     75
   URBAN POOR COVER
   "TURF"                     D       0.50     0.20      1.000     87
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.474
   SUBAREA AREA(ACRES) =    4.30      SUBAREA RUNOFF(CFS) =    8.84
   EFFECTIVE AREA(ACRES) =      11.70   AREA-AVERAGED Fm(INCH/HR) =  0.09
   AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.43
```

TOTAL AREA(ACRES) =   11.7   PEAK FLOW RATE(CFS) =   24.14

****
  FLOW PROCESS FROM NODE   334.00 TO NODE   335.00 IS CODE = 21

  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =   38.00 DOWNSTREAM(FEET) =   36.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   8.586
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.978
  SUBAREA Tc 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"   D   0.90   0.20   0.500   75   10.99
  COMMERCIAL   D   0.50   0.20   0.100   75   8.59
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.357
  SUBAREA RUNOFF(CFS) =   3.66
  TOTAL AREA(ACRES) =   1.40   PEAK FLOW RATE(CFS) =   3.66

****
  FLOW PROCESS FROM NODE   335.00 TO NODE   336.00 IS CODE = 62

  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 1 USED)<<<<<
==
  UPSTREAM ELEVATION(FEET) =   36.00 DOWNSTREAM ELEVATION(FEET) =   34.00
  STREET LENGTH(FEET) =   715.00   CURB HEIGHT(INCHES) = 6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   6.71
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) = 0.41
    HALFSTREET FLOOD WIDTH(FEET) =   14.57
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   1.48
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   0.60
  STREET FLOW TRAVEL TIME(MIN.) =   8.06   Tc(MIN.) =   16.65
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.038
  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"   D   2.30   0.20   0.500   75
  COMMERCIAL   D   1.10   0.20   0.100   75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.371

```
   SUBAREA AREA(ACRES) =    3.40      SUBAREA RUNOFF(CFS) =    6.01
   EFFECTIVE AREA(ACRES) =      4.80    AREA-AVERAGED Fm(INCH/HR) =  0.07
   AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.37
   TOTAL AREA(ACRES) =         4.8          PEAK FLOW RATE(CFS) =        8.49

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 0.44   HALFSTREET FLOOD WIDTH(FEET) = 15.98
   FLOW VELOCITY(FEET/SEC.) =  1.57   DEPTH*VELOCITY(FT*FT/SEC.) =   0.68
   LONGEST FLOWPATH FROM NODE    334.00 TO NODE    336.00 =    1045.00 FEET.

 *************************************************************************
   FLOW PROCESS FROM NODE    336.00 TO NODE    337.00 IS CODE =  62
 -------------------------------------------------------------------------------
   >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
 ===============================================================================
   UPSTREAM ELEVATION(FEET) =   34.00  DOWNSTREAM ELEVATION(FEET) =    33.00
   STREET LENGTH(FEET) =   277.00   CURB HEIGHT(INCHES) =  6.0
   STREET HALFWIDTH(FEET) = 20.00

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

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
   STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.06
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) =  0.45
     HALFSTREET FLOOD WIDTH(FEET) =   16.91
     AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.84
     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.84
   STREET FLOW TRAVEL TIME(MIN.) =   2.51   Tc(MIN.) =   19.16
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.880
   SUBAREA LOSS RATE DATA(AMC  II):
    DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp        Ap     SCS
        LAND USE          GROUP    (ACRES)  (INCH/HR) (DECIMAL)  CN
   RESIDENTIAL
   "5-7 DWELLINGS/ACRE"      D       2.40     0.20     0.500    75
   COMMERCIAL               D       0.60     0.20     0.100    75
   URBAN POOR COVER
   "TURF"                   D       0.20     0.20     1.000    87
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.456
   SUBAREA AREA(ACRES) =    3.20      SUBAREA RUNOFF(CFS) =    5.15
   EFFECTIVE AREA(ACRES) =      8.00    AREA-AVERAGED Fm(INCH/HR) =  0.08
   AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.40
   TOTAL AREA(ACRES) =         8.0          PEAK FLOW RATE(CFS) =       12.96

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 0.48   HALFSTREET FLOOD WIDTH(FEET) = 18.01
   FLOW VELOCITY(FEET/SEC.) =  1.91   DEPTH*VELOCITY(FT*FT/SEC.) =   0.91
   LONGEST FLOWPATH FROM NODE    334.00 TO NODE    337.00 =    1322.00 FEET.

 *************************************************************************
   FLOW PROCESS FROM NODE    337.00 TO NODE    338.00 IS CODE =  31
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  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    33.00  DOWNSTREAM(FEET) =    32.50
  FLOW LENGTH(FEET) =   119.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  18.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.03
  ESTIMATED PIPE DIAMETER(INCH) = 24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       12.96
  PIPE TRAVEL TIME(MIN.) =   0.39    Tc(MIN.) =   19.55
  LONGEST FLOWPATH FROM NODE    334.00 TO NODE    338.00 =    1441.00 FEET.


****************************************************************************
  FLOW PROCESS FROM NODE    339.00 TO NODE    340.00 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =    39.00  DOWNSTREAM(FEET) =    38.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.329
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.541
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL    AREA      Fp         Ap     SCS    Tc
      LAND USE            GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN   (MIN.)
  APARTMENTS                D        2.80      0.20      0.200     75   12.07
  COMMERCIAL                D        4.00      0.20      0.100     75   11.33
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.141
  SUBAREA RUNOFF(CFS) =      15.38
  TOTAL AREA(ACRES) =      6.80   PEAK FLOW RATE(CFS) =      15.38


****************************************************************************
  FLOW PROCESS FROM NODE    340.00 TO NODE    341.00 IS CODE =  62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =   38.50  DOWNSTREAM ELEVATION(FEET) =   38.00
  STREET LENGTH(FEET) =   337.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 42.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  21.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      21.81
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.68
    HALFSTREET FLOOD WIDTH(FEET) =    26.83
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.55
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.06
  STREET FLOW TRAVEL TIME(MIN.) =   3.62   Tc(MIN.) =   14.94
```

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                                      GC10EX
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.168
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL    AREA       Fp         Ap      SCS
      LAND USE           GROUP     (ACRES)  (INCH/HR)  (DECIMAL)   CN
 APARTMENTS                D         5.80      0.20      0.200     75
 COMMERCIAL                D         0.90      0.20      0.100     75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.187
 SUBAREA AREA(ACRES) =    6.70      SUBAREA RUNOFF(CFS) =   12.85
 EFFECTIVE AREA(ACRES) =     13.50    AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.16
 TOTAL AREA(ACRES) =        13.5        PEAK FLOW RATE(CFS) =     25.94

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.72   HALFSTREET FLOOD WIDTH(FEET) = 30.28
 FLOW VELOCITY(FEET/SEC.) =  1.62   DEPTH*VELOCITY(FT*FT/SEC.) =   1.16
 LONGEST FLOWPATH FROM NODE    339.00 TO NODE    341.00 =    667.00 FEET.

 *************************************************************************
  FLOW PROCESS FROM NODE    341.00 TO NODE    346.00 IS CODE =   31
 -------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
 =========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    38.00  DOWNSTREAM(FEET) =    37.50
  FLOW LENGTH(FEET) =   637.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  33.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.17
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      25.94
  PIPE TRAVEL TIME(MIN.) =   3.35    Tc(MIN.) =   18.30
  LONGEST FLOWPATH FROM NODE    339.00 TO NODE    346.00 =   1304.00 FEET.

 *************************************************************************
  FLOW PROCESS FROM NODE    346.00 TO NODE    346.00 IS CODE =    1
 -------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 =========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   18.30
  RAINFALL INTENSITY(INCH/HR) =   1.93
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.20
  AREA-AVERAGED Ap =  0.16
  EFFECTIVE STREAM AREA(ACRES) =      13.50
  TOTAL STREAM AREA(ACRES) =       13.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      25.94

 *************************************************************************
  FLOW PROCESS FROM NODE    342.00 TO NODE    343.00 IS CODE =   21
 -------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
 =========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =     39.00  DOWNSTREAM(FEET) =    38.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.329
```

```
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.541
   SUBAREA Tc 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"      D        1.50      0.20       0.500    75    14.50
   COMMERCIAL                D        0.60      0.20       0.100    75    11.33
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.386
   SUBAREA RUNOFF(CFS) =     4.66
   TOTAL AREA(ACRES) =      2.10   PEAK FLOW RATE(CFS) =      4.66

***************************************************************************
   FLOW PROCESS FROM NODE    343.00 TO NODE    344.00 IS CODE =  62
   --------------------------------------------------------------------------
   >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
   ==========================================================================
   UPSTREAM ELEVATION(FEET) =   38.50  DOWNSTREAM ELEVATION(FEET) =   38.00
   STREET LENGTH(FEET) =   502.00   CURB HEIGHT(INCHES) =  6.0
   STREET HALFWIDTH(FEET) = 20.00

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

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
   STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.91
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) =  0.50
     HALFSTREET FLOOD WIDTH(FEET) =   19.10
     AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.04
     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.52
   STREET FLOW TRAVEL TIME(MIN.) =   8.03   Tc(MIN.) =   19.36
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.869
   SUBAREA LOSS RATE DATA(AMC  II):
    DEVELOPMENT TYPE/     SCS SOIL    AREA       Fp          Ap     SCS
         LAND USE         GROUP    (ACRES)   (INCH/HR)  (DECIMAL)  CN
   RESIDENTIAL
   "5-7 DWELLINGS/ACRE"      D        3.00      0.20       0.500    75
   COMMERCIAL                D        1.00      0.20       0.100    75
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.400
   SUBAREA AREA(ACRES) =    4.00      SUBAREA RUNOFF(CFS) =    6.44
   EFFECTIVE AREA(ACRES) =      6.10    AREA-AVERAGED Fm(INCH/HR) =  0.08
   AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.40
   TOTAL AREA(ACRES) =       6.1        PEAK FLOW RATE(CFS) =       9.83

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 0.53   HALFSTREET FLOOD WIDTH(FEET) =  21.45
   FLOW VELOCITY(FEET/SEC.) = 1.11   DEPTH*VELOCITY(FT*FT/SEC.) =   0.59
   LONGEST FLOWPATH FROM NODE    342.00 TO NODE    344.00 =    832.00 FEET.

***************************************************************************
   FLOW PROCESS FROM NODE    344.00 TO NODE    345.00 IS CODE =  62
   --------------------------------------------------------------------------
```

```
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =   38.00  DOWNSTREAM ELEVATION(FEET) =    37.70
  STREET LENGTH(FEET) =   533.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      18.96
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.69
    HALFSTREET FLOOD WIDTH(FEET) =   29.39
    AVERAGE FLOW VELOCITY(FEET/SEC.) =     1.12
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.77
  STREET FLOW TRAVEL TIME(MIN.) =   7.93   Tc(MIN.) =   27.29
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.535
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA       Fp         Ap     SCS
       LAND USE           GROUP    (ACRES)   (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       D       10.70      0.20      0.500     75
  COMMERCIAL                 D        3.20      0.20      0.100     75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.408
  SUBAREA AREA(ACRES) =   13.90       SUBAREA RUNOFF(CFS) =   18.19
  EFFECTIVE AREA(ACRES) =    20.00    AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =       20.0       PEAK FLOW RATE(CFS) =      26.18

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.76   HALFSTREET FLOOD WIDTH(FEET) = 33.05
  FLOW VELOCITY(FEET/SEC.) = 1.22   DEPTH*VELOCITY(FT*FT/SEC.) =   0.93
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  533.0 FT WITH ELEVATION-DROP =   0.3 FT, IS   24.4 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    345.00
  LONGEST FLOWPATH FROM NODE    342.00 TO NODE    345.00 =   1365.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    345.00 TO NODE    346.00 IS CODE =   31
  --------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    37.70  DOWNSTREAM(FEET) =    37.50
  FLOW LENGTH(FEET) =   813.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  54.0 INCH PIPE IS  39.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.08
  ESTIMATED PIPE DIAMETER(INCH) = 54.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       26.18
  PIPE TRAVEL TIME(MIN.) =   6.51    Tc(MIN.) =   33.80
  LONGEST FLOWPATH FROM NODE    342.00 TO NODE    346.00 =   2178.00 FEET.
```

```
***************************************************************************
  FLOW PROCESS FROM NODE    346.00 TO NODE    346.00 IS CODE =   1
---------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
===========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   33.80
  RAINFALL INTENSITY(INCH/HR) =   1.36
  AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.20
  AREA-AVERAGED Ap =  0.40
  EFFECTIVE STREAM AREA(ACRES) =      20.00
  TOTAL STREAM AREA(ACRES) =      20.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      26.18

  ** CONFLUENCE DATA **
  STREAM     Q     Tc    Intensity  Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER    (CFS) (MIN.) (INCH/HR) (INCH/HR)        (ACRES)    NODE
    1       25.94  18.30   1.930   0.20( 0.03) 0.16    13.5    339.00
    2       26.18  33.80   1.358   0.20( 0.08) 0.40    20.0    342.00

  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       46.46  18.30   1.930   0.20( 0.05) 0.27    24.3    339.00
    2       44.30  33.80   1.358   0.20( 0.06) 0.31    33.5    342.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      46.46    Tc(MIN.) =    18.30
  EFFECTIVE AREA(ACRES) =      24.33   AREA-AVERAGED Fm(INCH/HR) =  0.05
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.27
  TOTAL AREA(ACRES) =        33.5
  LONGEST FLOWPATH FROM NODE    342.00 TO NODE    346.00 =    2178.00 FEET.

***************************************************************************
  FLOW PROCESS FROM NODE    346.00 TO NODE    347.00 IS CODE =  31
---------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    37.50  DOWNSTREAM(FEET) =    37.00
  FLOW LENGTH(FEET) =  1007.75   MANNING'S N =  0.013
  DEPTH OF FLOW IN  57.0 INCH PIPE IS  45.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.09
  ESTIMATED PIPE DIAMETER(INCH) = 57.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       46.46
  PIPE TRAVEL TIME(MIN.) =   5.44    Tc(MIN.) =   23.74
  LONGEST FLOWPATH FROM NODE    342.00 TO NODE    347.00 =    3185.75 FEET.

***************************************************************************
  FLOW PROCESS FROM NODE    347.00 TO NODE    347.00 IS CODE =  81
---------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===========================================================================
```

```
  MAINLINE Tc(MIN.) =    23.74
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.663
  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"       D       0.40      0.20     0.500    75
   APARTMENTS                 D       4.70      0.20     0.200    75
   COMMERCIAL                 D       8.50      0.20     0.100    75
   URBAN POOR COVER
   "TURF"                     D       5.10      0.20     1.000    87
   SCHOOL                     D      10.20      0.20     0.600    75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.457
  SUBAREA AREA(ACRES) =   28.90     SUBAREA RUNOFF(CFS) =    40.87
  EFFECTIVE AREA(ACRES) =     53.23   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.37
  TOTAL AREA(ACRES) =        62.4      PEAK FLOW RATE(CFS) =     76.09

***************************************************************************
  FLOW PROCESS FROM NODE    348.00 TO NODE    349.00 IS CODE =  21
-------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
=========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =     36.00  DOWNSTREAM(FEET) =     35.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.862
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.751
  SUBAREA Tc 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"       D       0.70      0.20     0.500    75  12.62
   COMMERCIAL                 D       0.40      0.20     0.100    75   9.86
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.355
  SUBAREA RUNOFF(CFS) =      2.65
  TOTAL AREA(ACRES) =      1.10   PEAK FLOW RATE(CFS) =      2.65

***************************************************************************
  FLOW PROCESS FROM NODE    349.00 TO NODE    350.00 IS CODE =  62
-------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
=========================================================================
  UPSTREAM ELEVATION(FEET) =   35.00  DOWNSTREAM ELEVATION(FEET) =   34.00
  STREET LENGTH(FEET) =   487.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200
```

```
     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.25
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) =  0.40
     HALFSTREET FLOOD WIDTH(FEET) =   14.02
     AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.24
     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.49
   STREET FLOW TRAVEL TIME(MIN.) =   6.53   Tc(MIN.) =   16.40
   *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.056
   SUBAREA LOSS RATE DATA(AMC  II):
    DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp        Ap      SCS
        LAND USE           GROUP    (ACRES)  (INCH/HR) (DECIMAL)  CN
   RESIDENTIAL
   "5-7 DWELLINGS/ACRE"       D       2.20      0.20     0.500     75
   COMMERCIAL                 D       0.70      0.20     0.100     75
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.403
   SUBAREA AREA(ACRES) =    2.90      SUBAREA RUNOFF(CFS) =    5.15
   EFFECTIVE AREA(ACRES) =      4.00    AREA-AVERAGED Fm(INCH/HR) =  0.08
   AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.39
   TOTAL AREA(ACRES) =        4.0        PEAK FLOW RATE(CFS) =       7.12

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 0.43   HALFSTREET FLOOD WIDTH(FEET) = 15.82
   FLOW VELOCITY(FEET/SEC.) = 1.34   DEPTH*VELOCITY(FT*FT/SEC.) =   0.58
   LONGEST FLOWPATH FROM NODE    348.00 TO NODE    350.00 =     817.00 FEET.

   ***************************************************************************
   FLOW PROCESS FROM NODE    350.00 TO NODE    351.00 IS CODE =  62
   ---------------------------------------------------------------------------
   >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
   ===========================================================================
   UPSTREAM ELEVATION(FEET) =   34.00  DOWNSTREAM ELEVATION(FEET) =    33.00
   STREET LENGTH(FEET) =   841.00   CURB HEIGHT(INCHES) =  6.0
   STREET HALFWIDTH(FEET) = 20.00

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

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
   STREET PARKWAY CROSSFALL(DECIMAL)  = 0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.84
     ***STREET FLOWING FULL***
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) =  0.53
     HALFSTREET FLOOD WIDTH(FEET) =   21.51
     AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.22
     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.65
   STREET FLOW TRAVEL TIME(MIN.) =  11.52   Tc(MIN.) =   27.91
   *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.515
   SUBAREA LOSS RATE DATA(AMC  II):
    DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp        Ap      SCS
        LAND USE           GROUP    (ACRES)  (INCH/HR) (DECIMAL)  CN
   RESIDENTIAL
   "5-7 DWELLINGS/ACRE"       D       4.40      0.20     0.500     75
```

COMMERCIAL   D   1.30   0.20   0.100   75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.409
SUBAREA AREA(ACRES) =   5.70   SUBAREA RUNOFF(CFS) =   7.35
EFFECTIVE AREA(ACRES) =   9.70   AREA-AVERAGED Fm(INCH/HR) = 0.08
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.40
TOTAL AREA(ACRES) =   9.7   PEAK FLOW RATE(CFS) =   12.53

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.55   HALFSTREET FLOOD WIDTH(FEET) = 22.49
FLOW VELOCITY(FEET/SEC.) = 1.28   DEPTH*VELOCITY(FT*FT/SEC.) =   0.71
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L = 841.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   9.8 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   351.00
LONGEST FLOWPATH FROM NODE   348.00 TO NODE   351.00 =   1658.00 FEET.

****
  FLOW PROCESS FROM NODE   351.00 TO NODE   364.00 IS CODE = 31

  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==
  ELEVATION DATA: UPSTREAM(FEET) =   33.00 DOWNSTREAM(FEET) =   32.50
  FLOW LENGTH(FEET) =   329.00   MANNING'S N = 0.013
  DEPTH OF FLOW IN 30.0 INCH PIPE IS 20.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.45
  ESTIMATED PIPE DIAMETER(INCH) = 30.00   NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =   12.53
  PIPE TRAVEL TIME(MIN.) =   1.59   Tc(MIN.) =   29.50
  LONGEST FLOWPATH FROM NODE   348.00 TO NODE   364.00 =   1987.00 FEET.

****
  FLOW PROCESS FROM NODE   364.00 TO NODE   364.00 IS CODE = 10

  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
==

****
  FLOW PROCESS FROM NODE   352.00 TO NODE   353.00 IS CODE = 21

  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =   34.00 DOWNSTREAM(FEET) =   33.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.329
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.541
  SUBAREA Tc 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"   D   1.90   0.20   0.500   75   14.50
  COMMERCIAL   D   0.50   0.20   0.100   75   11.33
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.417
  SUBAREA RUNOFF(CFS) =   5.31
  TOTAL AREA(ACRES) =   2.40   PEAK FLOW RATE(CFS) =   5.31

```
                                GC10EX
  **************************************************************************
    FLOW PROCESS FROM NODE    353.00 TO NODE    354.00 IS CODE =  62
  --------------------------------------------------------------------------
    >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
    >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
  ==========================================================================
    UPSTREAM ELEVATION(FEET) =   33.50  DOWNSTREAM ELEVATION(FEET) =   33.00
    STREET LENGTH(FEET) =  320.00   CURB HEIGHT(INCHES) =  6.0
    STREET HALFWIDTH(FEET) = 20.00

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

    SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
    STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
    Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
    Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

      **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.31
      STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
      STREET FLOW DEPTH(FEET) =  0.45
      HALFSTREET FLOOD WIDTH(FEET) =   16.91
      AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.22
      PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.55
    STREET FLOW TRAVEL TIME(MIN.) =   4.39   Tc(MIN.) =   15.72
    *  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"       D        1.80     0.20      0.500    75
    COMMERCIAL                 D        0.40     0.20      0.100    75
    SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
    SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.427
    SUBAREA AREA(ACRES) =    2.20       SUBAREA RUNOFF(CFS) =    4.00
    EFFECTIVE AREA(ACRES) =     4.60    AREA-AVERAGED Fm(INCH/HR) =  0.08
    AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.42
    TOTAL AREA(ACRES) =       4.6        PEAK FLOW RATE(CFS) =      8.37

    END OF SUBAREA STREET FLOW HYDRAULICS:
    DEPTH(FEET) = 0.47   HALFSTREET FLOOD WIDTH(FEET) = 17.85
    FLOW VELOCITY(FEET/SEC.) = 1.26   DEPTH*VELOCITY(FT*FT/SEC.) =   0.59
    LONGEST FLOWPATH FROM NODE    352.00 TO NODE    354.00 =    650.00 FEET.

  **************************************************************************
    FLOW PROCESS FROM NODE    354.00 TO NODE    363.00 IS CODE =  31
  --------------------------------------------------------------------------
    >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
    >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
  ==========================================================================
    ELEVATION DATA: UPSTREAM(FEET) =    33.00  DOWNSTREAM(FEET) =    32.70
    FLOW LENGTH(FEET) =  477.00   MANNING'S N =  0.013
    DEPTH OF FLOW IN  30.0 INCH PIPE IS  21.4 INCHES
    PIPE-FLOW VELOCITY(FEET/SEC.) =  2.23
    ESTIMATED PIPE DIAMETER(INCH) = 30.00    NUMBER OF PIPES =   1
    PIPE-FLOW(CFS) =       8.37
    PIPE TRAVEL TIME(MIN.) =  3.56    Tc(MIN.) =   19.27
    LONGEST FLOWPATH FROM NODE    352.00 TO NODE    363.00 =    1127.00 FEET.
```

```
*************************************************************************
  FLOW PROCESS FROM NODE    363.00 TO NODE    363.00 IS CODE =    1
-------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
=========================================================================
  TOTAL NUMBER OF STREAMS =   3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   19.27
  RAINFALL INTENSITY(INCH/HR) =    1.87
  AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.20
  AREA-AVERAGED Ap =  0.42
  EFFECTIVE STREAM AREA(ACRES) =        4.60
  TOTAL STREAM AREA(ACRES) =        4.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =        8.37


*************************************************************************
  FLOW PROCESS FROM NODE    355.00 TO NODE    356.00 IS CODE =   21
-------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
=========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =     35.00  DOWNSTREAM(FEET) =    34.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.329
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.541
  SUBAREA Tc 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"       D       1.60     0.20       0.500    75    14.50
  COMMERCIAL                 D       0.50     0.20       0.100    75    11.33
  URBAN POOR COVER
  "TURF"                     D       0.10     0.20       1.000    87    19.56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.432
  SUBAREA RUNOFF(CFS) =      4.86
  TOTAL AREA(ACRES) =      2.20   PEAK FLOW RATE(CFS) =      4.86


*************************************************************************
  FLOW PROCESS FROM NODE    356.00 TO NODE    357.00 IS CODE =   62
-------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
=========================================================================
  UPSTREAM ELEVATION(FEET) =    34.50  DOWNSTREAM ELEVATION(FEET) =    34.00
  STREET LENGTH(FEET) =    351.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200
```

```
  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      8.99
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) =  0.49
  HALFSTREET FLOOD WIDTH(FEET) =   18.71
  AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.23
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.60
STREET FLOW TRAVEL TIME(MIN.) =   4.75   Tc(MIN.) =   16.08
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.079
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/     SCS SOIL    AREA      Fp        Ap    SCS
     LAND USE          GROUP   (ACRES)  (INCH/HR) (DECIMAL)  CN
RESIDENTIAL
"5-7 DWELLINGS/ACRE"      D       3.00     0.20     0.500    75
COMMERCIAL                D       1.10     0.20     0.100    75
URBAN POOR COVER
"TURF"                    D       0.50     0.20     1.000    87
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.459
SUBAREA AREA(ACRES) =    4.60       SUBAREA RUNOFF(CFS) =    8.23
EFFECTIVE AREA(ACRES) =     6.80    AREA-AVERAGED Fm(INCH/HR) =  0.09
AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.45
TOTAL AREA(ACRES) =        6.8        PEAK FLOW RATE(CFS) =     12.17

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.53   HALFSTREET FLOOD WIDTH(FEET) =  21.64
FLOW VELOCITY(FEET/SEC.) =  1.35   DEPTH*VELOCITY(FT*FT/SEC.) =   0.72
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L =  351.0 FT WITH ELEVATION-DROP =   0.5 FT, IS   9.9 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    357.00
LONGEST FLOWPATH FROM NODE    355.00 TO NODE    357.00 =    681.00 FEET.

***************************************************************************
 FLOW PROCESS FROM NODE    357.00 TO NODE    358.00 IS CODE =  62
---------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
===========================================================================
 UPSTREAM ELEVATION(FEET) =   34.00  DOWNSTREAM ELEVATION(FEET) =   33.50
 STREET LENGTH(FEET) =   586.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 20.00

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

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.79
   ***STREET FLOWING FULL***
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.60
   HALFSTREET FLOOD WIDTH(FEET) =   25.05
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.21
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.73
STREET FLOW TRAVEL TIME(MIN.) =   8.06   Tc(MIN.) =   24.13
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.647
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"       D       2.90     0.20     0.500     75
 COMMERCIAL                 D       0.80     0.20     0.100     75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.414
 SUBAREA AREA(ACRES) =    3.70      SUBAREA RUNOFF(CFS) =    5.21
 EFFECTIVE AREA(ACRES) =     10.50    AREA-AVERAGED Fm(INCH/HR) =  0.09
 AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.44
 TOTAL AREA(ACRES) =       10.5       PEAK FLOW RATE(CFS) =      14.74

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.60   HALFSTREET FLOOD WIDTH(FEET) = 25.05
 FLOW VELOCITY(FEET/SEC.) = 1.21   DEPTH*VELOCITY(FT*FT/SEC.) =   0.73
 LONGEST FLOWPATH FROM NODE    355.00 TO NODE    358.00 =   1267.00 FEET.

***************************************************************************
 FLOW PROCESS FROM NODE    358.00 TO NODE    363.00 IS CODE =   31
---------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===========================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    33.50  DOWNSTREAM(FEET) =    32.70
 FLOW LENGTH(FEET) =   739.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  33.0 INCH PIPE IS  24.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.14
 ESTIMATED PIPE DIAMETER(INCH) = 33.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       14.74
 PIPE TRAVEL TIME(MIN.) =   3.92    Tc(MIN.) =   28.05
 LONGEST FLOWPATH FROM NODE    355.00 TO NODE    363.00 =   2006.00 FEET.

***************************************************************************
 FLOW PROCESS FROM NODE    363.00 TO NODE    363.00 IS CODE =    1
---------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
===========================================================================
 TOTAL NUMBER OF STREAMS =  3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   28.05
 RAINFALL INTENSITY(INCH/HR) =   1.51
 AREA-AVERAGED Fm(INCH/HR) =  0.09
 AREA-AVERAGED Fp(INCH/HR) =  0.20
 AREA-AVERAGED Ap =  0.44
 EFFECTIVE STREAM AREA(ACRES) =      10.50
 TOTAL STREAM AREA(ACRES) =      10.50
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      14.74

***************************************************************************
 FLOW PROCESS FROM NODE    359.00 TO NODE    360.00 IS CODE =   21
---------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
===========================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
 ELEVATION DATA: UPSTREAM(FEET) =      36.00  DOWNSTREAM(FEET) =      35.00

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.862
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.751
```

```
  SUBAREA Tc 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"       D      2.40     0.20     0.500    75   12.62
   COMMERCIAL                 D      0.50     0.20     0.100    75    9.86
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.431
   SUBAREA RUNOFF(CFS) =       6.95
   TOTAL AREA(ACRES) =      2.90   PEAK FLOW RATE(CFS) =      6.95


  ***************************************************************************
   FLOW PROCESS FROM NODE    360.00 TO NODE    361.00 IS CODE =  62
  -------------------------------------------------------------------------------
   >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
  ===============================================================================
   UPSTREAM ELEVATION(FEET) =   35.00  DOWNSTREAM ELEVATION(FEET) =   34.00
   STREET LENGTH(FEET) =  1191.00   CURB HEIGHT(INCHES) =  6.0
   STREET HALFWIDTH(FEET) = 20.00

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

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
   STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.29
     ***STREET FLOWING FULL***
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) =  0.57
     HALFSTREET FLOOD WIDTH(FEET) =    23.65
     AVERAGE FLOW VELOCITY(FEET/SEC.) =     1.13
     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =     0.65
   STREET FLOW TRAVEL TIME(MIN.) =  17.49   Tc(MIN.) =    27.36
   *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.533
   SUBAREA LOSS RATE DATA(AMC  II):
    DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp        Ap     SCS
        LAND USE           GROUP   (ACRES)  (INCH/HR) (DECIMAL)  CN
    RESIDENTIAL
    "5-7 DWELLINGS/ACRE"       D      5.60     0.20     0.500    75
    COMMERCIAL                 D      2.00     0.20     0.100    75
    URBAN POOR COVER
    "TURF"                     D      0.30     0.20     1.000    87
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.418
   SUBAREA AREA(ACRES) =    7.90       SUBAREA RUNOFF(CFS) =   10.31
   EFFECTIVE AREA(ACRES) =     10.80    AREA-AVERAGED Fm(INCH/HR) =  0.08
   AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.42
   TOTAL AREA(ACRES) =       10.8        PEAK FLOW RATE(CFS) =     14.08

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 0.59   HALFSTREET FLOOD WIDTH(FEET) = 24.69
   FLOW VELOCITY(FEET/SEC.) =  1.19   DEPTH*VELOCITY(FT*FT/SEC.) =   0.71
   *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
          AND L = 1191.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   12.0 CFS,
          WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    361.00
```

LONGEST FLOWPATH FROM NODE   359.00 TO NODE   361.00 =   1521.00 FEET.

****
  FLOW PROCESS FROM NODE   361.00 TO NODE   363.00 IS CODE = 31

  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==
  ELEVATION DATA: UPSTREAM(FEET) =   34.00 DOWNSTREAM(FEET) =   32.70
  FLOW LENGTH(FEET) =   743.00   MANNING'S N = 0.013
  DEPTH OF FLOW IN 30.0 INCH PIPE IS 21.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.73
  ESTIMATED PIPE DIAMETER(INCH) = 30.00   NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =   14.08
  PIPE TRAVEL TIME(MIN.) =   3.32   Tc(MIN.) =   30.67
  LONGEST FLOWPATH FROM NODE   359.00 TO NODE   363.00 =   2264.00 FEET.

****
  FLOW PROCESS FROM NODE   363.00 TO NODE   363.00 IS CODE =   1

  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==
  TOTAL NUMBER OF STREAMS = 3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 3 ARE:
  TIME OF CONCENTRATION(MIN.) =   30.67
  RAINFALL INTENSITY(INCH/HR) =   1.44
  AREA-AVERAGED Fm(INCH/HR) = 0.08
  AREA-AVERAGED Fp(INCH/HR) = 0.20
  AREA-AVERAGED Ap = 0.42
  EFFECTIVE STREAM AREA(ACRES) =   10.80
  TOTAL STREAM AREA(ACRES) =   10.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   14.08

  ** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8.37	19.27	1.874	0.20(0.08)	0.42	4.6	352.00
2	14.74	28.05	1.511	0.20(0.09)	0.44	10.5	355.00
3	14.08	30.67	1.436	0.20(0.08)	0.42	10.8	359.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR 3 STREAMS.

  ** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	32.79	19.27	1.874	0.20(0.09)	0.43	18.6	352.00
2	35.01	28.05	1.511	0.20(0.09)	0.43	25.0	355.00
3	34.36	30.67	1.436	0.20(0.09)	0.43	25.9	359.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   35.01   Tc(MIN.) =   28.05
  EFFECTIVE AREA(ACRES) =   24.98   AREA-AVERAGED Fm(INCH/HR) = 0.09
  AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.43
  TOTAL AREA(ACRES) =   25.9
  LONGEST FLOWPATH FROM NODE   359.00 TO NODE   363.00 =   2264.00 FEET.

****
  FLOW PROCESS FROM NODE   363.00 TO NODE   364.00 IS CODE = 31

```
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    32.70  DOWNSTREAM(FEET) =    32.50
  FLOW LENGTH(FEET) =   170.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  33.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.03
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       35.01
  PIPE TRAVEL TIME(MIN.) =   0.70    Tc(MIN.) =   28.76
  LONGEST FLOWPATH FROM NODE    359.00 TO NODE    364.00 =    2434.00 FEET.

*************************************************************************
  FLOW PROCESS FROM NODE    364.00 TO NODE    364.00 IS CODE =  11
--------------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
================================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     Q      Tc   Intensity   Fp(Fm)     Ap     Ae    HEADWATER
  NUMBER   (CFS)  (MIN.) (INCH/HR) (INCH/HR)        (ACRES)    NODE
     1     32.79   19.99    1.835  0.20( 0.09) 0.43     18.6    352.00
     2     35.01   28.76    1.490  0.20( 0.09) 0.43     25.0    355.00
     3     34.36   31.38    1.417  0.20( 0.09) 0.43     25.9    359.00
  LONGEST FLOWPATH FROM NODE    359.00 TO NODE    364.00 =    2434.00 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     12.53   29.50    1.468  0.20( 0.08) 0.40      9.7    348.00
  LONGEST FLOWPATH FROM NODE    348.00 TO NODE    364.00 =    1987.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM     Q      Tc   Intensity   Fp(Fm)     Ap     Ae    HEADWATER
  NUMBER   (CFS)  (MIN.) (INCH/HR) (INCH/HR)        (ACRES)    NODE
     1     43.53   19.99    1.835  0.20( 0.08) 0.42     25.2    352.00
     2     47.42   28.76    1.490  0.20( 0.08) 0.42     34.4    355.00
     3     47.36   29.50    1.468  0.20( 0.08) 0.42     34.9    348.00
     4     46.43   31.38    1.417  0.20( 0.08) 0.42     35.6    359.00
    TOTAL AREA(ACRES) =       35.6

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      47.42  Tc(MIN.) =   28.757
  EFFECTIVE AREA(ACRES) =     34.43  AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.42
  TOTAL AREA(ACRES) =       35.6
  LONGEST FLOWPATH FROM NODE    359.00 TO NODE    364.00 =    2434.00 FEET.

*************************************************************************
  FLOW PROCESS FROM NODE    364.00 TO NODE    364.00 IS CODE =  12
--------------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
================================================================================

*************************************************************************
  FLOW PROCESS FROM NODE    364.00 TO NODE    368.00 IS CODE =  31
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     32.50  DOWNSTREAM(FEET) =     32.00
  FLOW LENGTH(FEET) =    483.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  51.0 INCH PIPE IS  38.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =    4.12
  ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =    1
  PIPE-FLOW(CFS) =        47.42
  PIPE TRAVEL TIME(MIN.) =   1.95    Tc(MIN.) =    30.71
  LONGEST FLOWPATH FROM NODE     359.00 TO NODE     368.00 =    2917.00 FEET.


****************************************************************************
  FLOW PROCESS FROM NODE    368.00 TO NODE    368.00 IS CODE =    1
--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   30.71
  RAINFALL INTENSITY(INCH/HR) =    1.43
  AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.20
  AREA-AVERAGED Ap =  0.42
  EFFECTIVE STREAM AREA(ACRES) =        34.43
  TOTAL STREAM AREA(ACRES) =       35.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       47.42


****************************************************************************
  FLOW PROCESS FROM NODE    365.00 TO NODE    366.00 IS CODE =   21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =      36.00  DOWNSTREAM(FEET) =      35.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.862
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.751
  SUBAREA Tc 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"      D        2.00      0.20      0.500     75   12.62
   COMMERCIAL               D        0.30      0.20      0.100     75    9.86
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.448
   SUBAREA RUNOFF(CFS) =        5.51
   TOTAL AREA(ACRES) =       2.30   PEAK FLOW RATE(CFS) =       5.51


****************************************************************************
  FLOW PROCESS FROM NODE    366.00 TO NODE    367.00 IS CODE =   62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =   35.00  DOWNSTREAM ELEVATION(FEET) =   33.00
  STREET LENGTH(FEET) =   765.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  10.00
```

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.84
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.51
    HALFSTREET FLOOD WIDTH(FEET) =   20.11
    AVERAGE FLOW VELOCITY(FEET/SEC.) =     1.73
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =     0.88
  STREET FLOW TRAVEL TIME(MIN.) =   7.39   Tc(MIN.) =   17.25
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.996
  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"       D       7.10      0.20      0.500     75
  COMMERCIAL                 D       2.40      0.20      0.100     75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.399
  SUBAREA AREA(ACRES) =    9.50       SUBAREA RUNOFF(CFS) =   16.39
  EFFECTIVE AREA(ACRES) =     11.80    AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.41
  TOTAL AREA(ACRES) =       11.8        PEAK FLOW RATE(CFS) =     20.34

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.56   HALFSTREET FLOOD WIDTH(FEET) =  23.16
  FLOW VELOCITY(FEET/SEC.) = 1.96   DEPTH*VELOCITY(FT*FT/SEC.) =   1.10
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  765.0 FT WITH ELEVATION-DROP =   2.0 FT, IS   18.4 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    367.00
  LONGEST FLOWPATH FROM NODE    365.00 TO NODE    367.00 =   1095.00 FEET.

  **************************************************************************
  FLOW PROCESS FROM NODE    367.00 TO NODE    368.00 IS CODE =  62
  --------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
  ==========================================================================
  UPSTREAM ELEVATION(FEET) =   33.00  DOWNSTREAM ELEVATION(FEET) =   32.00
  STREET LENGTH(FEET) =   649.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      25.74
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.65
```

```
   HALFSTREET FLOOD WIDTH(FEET) =    27.37
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.76
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.14
STREET FLOW TRAVEL TIME(MIN.) =   6.15   Tc(MIN.) =    23.40
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.677
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/     SCS SOIL   AREA      Fp        Ap    SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR) (DECIMAL)  CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"      D       5.30     0.20     0.500    75
 COMMERCIAL               D       2.20     0.20     0.100    75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.383
 SUBAREA AREA(ACRES) =    7.50      SUBAREA RUNOFF(CFS) =   10.80
 EFFECTIVE AREA(ACRES) =     19.30    AREA-AVERAGED Fm(INCH/HR) =  0.08
 AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.40
 TOTAL AREA(ACRES) =       19.3       PEAK FLOW RATE(CFS) =     27.74

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.66   HALFSTREET FLOOD WIDTH(FEET) =  28.11
 FLOW VELOCITY(FEET/SEC.) =  1.80   DEPTH*VELOCITY(FT*FT/SEC.) =   1.19
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  649.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   14.2 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    368.00
 LONGEST FLOWPATH FROM NODE    365.00 TO NODE    368.00 =    1744.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    368.00 TO NODE    368.00 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.) =   23.40
  RAINFALL INTENSITY(INCH/HR) =   1.68
  AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.20
  AREA-AVERAGED Ap =  0.40
  EFFECTIVE STREAM AREA(ACRES) =      19.30
  TOTAL STREAM AREA(ACRES) =      19.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      27.74

  ** CONFLUENCE DATA **
  STREAM      Q     Tc    Intensity  Fp(Fm)     Ap     Ae    HEADWATER
  NUMBER    (CFS) (MIN.) (INCH/HR) (INCH/HR)        (ACRES)    NODE
    1      43.53  22.01   1.736  0.20( 0.08) 0.42     25.2    352.00
    1      47.42  30.71   1.435  0.20( 0.08) 0.42     34.4    355.00
    1      47.36  31.45   1.415  0.20( 0.08) 0.42     34.9    348.00
    1      46.43  33.34   1.369  0.20( 0.08) 0.42     35.6    359.00
    2      27.74  23.40   1.677  0.20( 0.08) 0.40     19.3    365.00

  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      70.59  22.01   1.736  0.20( 0.08) 0.41     43.3    352.00
    2      71.89  23.40   1.677  0.20( 0.08) 0.41     46.0    365.00
```

```
        3       70.95   30.71   1.435  0.20( 0.08) 0.41      53.7     355.00
        4       70.56   31.45   1.415  0.20( 0.08) 0.41      54.2     348.00
        5       68.82   33.34   1.369  0.20( 0.08) 0.41      54.9     359.00


  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       71.89    Tc(MIN.) =    23.40
  EFFECTIVE AREA(ACRES) =      45.95   AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.41
  TOTAL AREA(ACRES) =       54.9
  LONGEST FLOWPATH FROM NODE    359.00 TO NODE    368.00 =    2917.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    368.00 TO NODE    374.00 IS CODE =  31
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    32.00  DOWNSTREAM(FEET) =    31.00
  FLOW LENGTH(FEET) = 1208.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  63.0 INCH PIPE IS  46.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.23
  ESTIMATED PIPE DIAMETER(INCH) =  63.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       71.89
  PIPE TRAVEL TIME(MIN.) =   4.77    Tc(MIN.) =    28.17
  LONGEST FLOWPATH FROM NODE    359.00 TO NODE    374.00 =    4125.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    374.00 TO NODE    374.00 IS CODE =   1
--------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   28.17
  RAINFALL INTENSITY(INCH/HR) =   1.51
  AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.20
  AREA-AVERAGED Ap =  0.41
  EFFECTIVE STREAM AREA(ACRES) =      45.95
  TOTAL STREAM AREA(ACRES) =      54.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      71.89

**************************************************************************
  FLOW PROCESS FROM NODE    369.00 TO NODE    370.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =    32.50  DOWNSTREAM(FEET) =    32.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.329
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.541
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
```

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
COMMERCIAL	D	0.50	0.20	0.100	75	11.33
URBAN POOR COVER "TURF"	D	0.30	0.20	1.000	87	19.56

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.438
SUBAREA RUNOFF(CFS) =   1.77
TOTAL AREA(ACRES) =   0.80   PEAK FLOW RATE(CFS) =   1.77

****
  FLOW PROCESS FROM NODE   370.00 TO NODE   371.00 IS CODE = 62

  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 2 USED)<<<<<
==
  UPSTREAM ELEVATION(FEET) =   32.00 DOWNSTREAM ELEVATION(FEET) =   31.80
  STREET LENGTH(FEET) =   149.00   CURB HEIGHT(INCHES) = 8.0
  STREET HALFWIDTH(FEET) = 42.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   7.11
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) = 0.50
    HALFSTREET FLOOD WIDTH(FEET) =   17.10
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   1.14
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   0.57
  STREET FLOW TRAVEL TIME(MIN.) =   2.17   Tc(MIN.) =   13.50
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.297
  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"   D   5.20   0.20   0.500   75
  COMMERCIAL   D   0.10   0.20   0.100   75
  URBAN POOR COVER
  "TURF"   D   0.10   0.20   1.000   87
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.502
  SUBAREA AREA(ACRES) =   5.40   SUBAREA RUNOFF(CFS) =   10.68
  EFFECTIVE AREA(ACRES) =   6.20   AREA-AVERAGED Fm(INCH/HR) = 0.10
  AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap = 0.49
  TOTAL AREA(ACRES) =   6.2   PEAK FLOW RATE(CFS) =   12.27

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.58   HALFSTREET FLOOD WIDTH(FEET) = 21.29
  FLOW VELOCITY(FEET/SEC.) = 1.30   DEPTH*VELOCITY(FT*FT/SEC.) =   0.76
  LONGEST FLOWPATH FROM NODE   369.00 TO NODE   371.00 =   479.00 FEET.

****
  FLOW PROCESS FROM NODE   371.00 TO NODE   372.00 IS CODE = 62

  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 2 USED)<<<<<
==
  UPSTREAM ELEVATION(FEET) =   31.80 DOWNSTREAM ELEVATION(FEET) =   31.60
  STREET LENGTH(FEET) =   294.00   CURB HEIGHT(INCHES) = 8.0

```
  STREET HALFWIDTH(FEET) = 42.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  21.00
  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  = 0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
  STREET PARKWAY CROSSFALL(DECIMAL)  = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =  0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =  0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     20.79
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) = 0.75
    HALFSTREET FLOOD WIDTH(FEET) =   34.05
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.13
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.85
  STREET FLOW TRAVEL TIME(MIN.) =   4.35   Tc(MIN.) =   17.85
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.958
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp        Ap     SCS
       LAND USE           GROUP   (ACRES)  (INCH/HR) (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       D       8.50      0.20     0.500    75
  COMMERCIAL                 D       1.60      0.20     0.100    75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.437
  SUBAREA AREA(ACRES) =   10.10      SUBAREA RUNOFF(CFS) =   17.00
  EFFECTIVE AREA(ACRES) =      16.30    AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.46
  TOTAL AREA(ACRES) =       16.3        PEAK FLOW RATE(CFS) =      27.38

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.82   HALFSTREET FLOOD WIDTH(FEET) =  40.29
  FLOW VELOCITY(FEET/SEC.) = 1.19   DEPTH*VELOCITY(FT*FT/SEC.) =   0.97
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  294.0 FT WITH ELEVATION-DROP =   0.2 FT, IS   20.8 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    372.00
  LONGEST FLOWPATH FROM NODE    369.00 TO NODE    372.00 =     773.00 FEET.

  *************************************************************************
   FLOW PROCESS FROM NODE    372.00 TO NODE    373.00 IS CODE =  62
  -----------------------------------------------------------------------
   >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
  =======================================================================
   UPSTREAM ELEVATION(FEET) =   31.60  DOWNSTREAM ELEVATION(FEET) =   31.40
   STREET LENGTH(FEET) =   285.00   CURB HEIGHT(INCHES) = 8.0
   STREET HALFWIDTH(FEET) = 42.00

   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  21.00
   INSIDE STREET CROSSFALL(DECIMAL) = 0.020
   OUTSIDE STREET CROSSFALL(DECIMAL)  = 0.020

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
   STREET PARKWAY CROSSFALL(DECIMAL)  = 0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =  0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =  0.0200

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     34.73
```

```
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.87
   HALFSTREET FLOOD WIDTH(FEET) =   45.86
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.25
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.09
 STREET FLOW TRAVEL TIME(MIN.) =   3.81   Tc(MIN.) =   21.66
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.752
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE           GROUP    (ACRES)  (INCH/HR) (DECIMAL)  CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"       D       8.00     0.20     0.500     75
 COMMERCIAL                 D       1.80     0.20     0.100     75
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.427
 SUBAREA AREA(ACRES) =    9.80     SUBAREA RUNOFF(CFS) =   14.70
 EFFECTIVE AREA(ACRES) =     26.10   AREA-AVERAGED Fm(INCH/HR) =  0.09
 AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.45
 TOTAL AREA(ACRES) =       26.1       PEAK FLOW RATE(CFS) =      39.07

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.90   HALFSTREET FLOOD WIDTH(FEET) =  48.82
 FLOW VELOCITY(FEET/SEC.) =  1.27   DEPTH*VELOCITY(FT*FT/SEC.) =   1.15
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  285.0 FT WITH ELEVATION-DROP =   0.2 FT, IS   20.5 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    373.00
 LONGEST FLOWPATH FROM NODE    369.00 TO NODE    373.00 =   1058.00 FEET.

 **************************************************************************
  FLOW PROCESS FROM NODE    373.00 TO NODE    374.00 IS CODE =  62
 -----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
 =============================================================================
  UPSTREAM ELEVATION(FEET) =   31.40  DOWNSTREAM ELEVATION(FEET) =   31.00
  STREET LENGTH(FEET) =   369.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 42.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  21.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      53.89
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.93
    HALFSTREET FLOOD WIDTH(FEET) =   51.61
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.61
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.49
 STREET FLOW TRAVEL TIME(MIN.) =   3.82   Tc(MIN.) =   25.48
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.597
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE           GROUP    (ACRES)  (INCH/HR) (DECIMAL)  CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"       D      10.00     0.20     0.500     75
```

```
COMMERCIAL                  D       11.40     0.20     0.100     75
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.287
SUBAREA AREA(ACRES) =   21.40      SUBAREA RUNOFF(CFS) =   29.65
EFFECTIVE AREA(ACRES) =      47.50    AREA-AVERAGED Fm(INCH/HR) =  0.07
AREA-AVERAGED Fp(INCH/HR) = 0.20  AREA-AVERAGED Ap =  0.37
TOTAL AREA(ACRES) =        47.5        PEAK FLOW RATE(CFS) =      65.06

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.98   HALFSTREET FLOOD WIDTH(FEET) =  56.86
FLOW VELOCITY(FEET/SEC.) =  1.66   DEPTH*VELOCITY(FT*FT/SEC.) =   1.63
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L =  369.0 FT WITH ELEVATION-DROP =   0.4 FT, IS   44.8 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    374.00
LONGEST FLOWPATH FROM NODE    369.00 TO NODE    374.00 =   1427.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    374.00 TO NODE    374.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   25.48
  RAINFALL INTENSITY(INCH/HR) =   1.60
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.20
  AREA-AVERAGED Ap =  0.37
  EFFECTIVE STREAM AREA(ACRES) =      47.50
  TOTAL STREAM AREA(ACRES) =      47.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      65.06
```

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	70.59	26.89	1.548	0.20(0.08)	0.41	43.3	352.00
1	71.89	28.17	1.508	0.20(0.08)	0.41	46.0	365.00
1	70.95	35.59	1.319	0.20(0.08)	0.41	53.7	355.00
1	70.56	36.33	1.303	0.20(0.08)	0.41	54.2	348.00
1	68.82	38.22	1.266	0.20(0.08)	0.41	54.9	359.00
2	65.06	25.48	1.597	0.20(0.07)	0.37	47.5	369.00

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	134.17	25.48	1.597	0.20(0.08)	0.39	88.6	369.00
2	133.58	26.89	1.548	0.20(0.08)	0.39	90.8	352.00
3	133.13	28.17	1.508	0.20(0.08)	0.39	93.5	365.00
4	124.12	35.59	1.319	0.20(0.08)	0.39	101.2	355.00
5	123.06	36.33	1.303	0.20(0.08)	0.39	101.7	348.00
6	119.73	38.22	1.266	0.20(0.08)	0.40	102.4	359.00

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      134.17    Tc(MIN.) =     25.48
  EFFECTIVE AREA(ACRES) =      88.56    AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.39
```

```
  TOTAL AREA(ACRES) =     102.4
  LONGEST FLOWPATH FROM NODE    359.00 TO NODE    374.00 =   4125.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    374.00 TO NODE    375.00 IS CODE =  31
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    31.00  DOWNSTREAM(FEET) =    30.00
  FLOW LENGTH(FEET) =   807.12   MANNING'S N =  0.013
  DEPTH OF FLOW IN  72.0 INCH PIPE IS  55.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =    5.69
  ESTIMATED PIPE DIAMETER(INCH) = 72.00    NUMBER OF PIPES =    1
  PIPE-FLOW(CFS) =      134.17
  PIPE TRAVEL TIME(MIN.) =    2.36    Tc(MIN.) =   27.85
  LONGEST FLOWPATH FROM NODE    359.00 TO NODE    375.00 =   4932.12 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    376.00 TO NODE    377.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =    38.00  DOWNSTREAM(FEET) =    37.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.862
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.751
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
```

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
COMMERCIAL URBAN POOR COVER	D	8.50	0.20	0.100	75	9.86
"TURF"	D	0.40	0.20	1.000	87	17.03

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.140
  SUBAREA RUNOFF(CFS) =      21.81
  TOTAL AREA(ACRES) =      8.90   PEAK FLOW RATE(CFS) =     21.81

**************************************************************************
  FLOW PROCESS FROM NODE    377.00 TO NODE    378.00 IS CODE =  62
--------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  3 USED)<<<<<
==========================================================================
  UPSTREAM ELEVATION(FEET) =   37.00  DOWNSTREAM ELEVATION(FEET) =   36.00
  STREET LENGTH(FEET) =   398.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 51.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  25.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150
```

```
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      31.83
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.70
   HALFSTREET FLOOD WIDTH(FEET) =   29.02
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.09
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.47
 STREET FLOW TRAVEL TIME(MIN.) =   3.18   Tc(MIN.) =   13.04
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.344
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL    AREA      Fp         Ap     SCS
      LAND USE           GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL               D       9.30      0.20      0.100     75
 URBAN POOR COVER
 "TURF"                   D       0.30      0.20      1.000     87
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.128
 SUBAREA AREA(ACRES) =    9.60      SUBAREA RUNOFF(CFS) =   20.03
 EFFECTIVE AREA(ACRES) =     18.50    AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.13
 TOTAL AREA(ACRES) =        18.5      PEAK FLOW RATE(CFS) =      38.57

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.74   HALFSTREET FLOOD WIDTH(FEET) =  33.12
 FLOW VELOCITY(FEET/SEC.) =  2.17   DEPTH*VELOCITY(FT*FT/SEC.) =   1.61
 LONGEST FLOWPATH FROM NODE    376.00 TO NODE    378.00 =    728.00 FEET.

 **************************************************************************
  FLOW PROCESS FROM NODE    378.00 TO NODE    379.00 IS CODE =  62
 --------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  3 USED)<<<<<
 ==========================================================================
  UPSTREAM ELEVATION(FEET) =   36.00  DOWNSTREAM ELEVATION(FEET) =   34.00
  STREET LENGTH(FEET) =   537.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 51.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  25.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      50.86
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.76
    HALFSTREET FLOOD WIDTH(FEET) =   34.88
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.68
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.04
 STREET FLOW TRAVEL TIME(MIN.) =   3.34   Tc(MIN.) =   16.39
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.056
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL    AREA      Fp         Ap     SCS
      LAND USE           GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL               D      12.40      0.20      0.100     75
 URBAN POOR COVER
 "TURF"                   D       1.10      0.20      1.000     87
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
```

```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.173
  SUBAREA AREA(ACRES) =   13.50      SUBAREA RUNOFF(CFS) =   24.56
  EFFECTIVE AREA(ACRES) =      32.00    AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.15
  TOTAL AREA(ACRES) =        32.0        PEAK FLOW RATE(CFS) =       58.35

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.79   HALFSTREET FLOOD WIDTH(FEET) =  38.01
  FLOW VELOCITY(FEET/SEC.) =  2.74   DEPTH*VELOCITY(FT*FT/SEC.) =   2.17
  LONGEST FLOWPATH FROM NODE    376.00 TO NODE    379.00 =   1265.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    379.00 TO NODE    380.00 IS CODE =  31
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    34.00  DOWNSTREAM(FEET) =    33.00
  FLOW LENGTH(FEET) =   236.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  32.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.34
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =    1
  PIPE-FLOW(CFS) =       58.35
  PIPE TRAVEL TIME(MIN.) =   0.54    Tc(MIN.) =   16.92
  LONGEST FLOWPATH FROM NODE    376.00 TO NODE    380.00 =   1501.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    381.00 TO NODE    382.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =     38.00  DOWNSTREAM(FEET) =     37.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.862
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.751
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
```

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
RESIDENTIAL						
"5-7 DWELLINGS/ACRE"	D	4.90	0.20	0.500	75	12.62
COMMERCIAL	D	0.60	0.20	0.100	75	9.86
URBAN POOR COVER						
"TURF"	D	1.60	0.20	1.000	87	17.03

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.579
  SUBAREA RUNOFF(CFS) =    16.84
  TOTAL AREA(ACRES) =      7.10   PEAK FLOW RATE(CFS) =     16.84

**************************************************************************
  FLOW PROCESS FROM NODE    382.00 TO NODE    383.00 IS CODE =  62
--------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
==========================================================================
  UPSTREAM ELEVATION(FEET) =   37.00  DOWNSTREAM ELEVATION(FEET) =   36.50
  STREET LENGTH(FEET) =   994.00   CURB HEIGHT(INCHES) = 8.0
  STREET HALFWIDTH(FEET) = 42.00
```

```
    DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  21.00
    INSIDE STREET CROSSFALL(DECIMAL) =  0.020
    OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

    SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
    STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
    Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
    Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

      **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      28.89
      STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
      STREET FLOW DEPTH(FEET) =  0.87
      HALFSTREET FLOOD WIDTH(FEET) =   45.37
      AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.05
      PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.91
    STREET FLOW TRAVEL TIME(MIN.) =  15.73   Tc(MIN.) =   25.59
    *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.593
    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"       D       6.80      0.20      0.500     75
    APARTMENTS                 D       6.10      0.20      0.200     75
    COMMERCIAL                 D       4.10      0.20      0.100     75
    URBAN POOR COVER
    "TURF"                     D       0.20      0.20      1.000     87
    SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
    SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.304
    SUBAREA AREA(ACRES) =   17.20       SUBAREA RUNOFF(CFS) =   23.71
    EFFECTIVE AREA(ACRES) =    24.30    AREA-AVERAGED Fm(INCH/HR) =  0.08
    AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.38
    TOTAL AREA(ACRES) =      24.3       PEAK FLOW RATE(CFS) =      33.15

    END OF SUBAREA STREET FLOW HYDRAULICS:
    DEPTH(FEET) = 0.90   HALFSTREET FLOOD WIDTH(FEET) =  48.98
    FLOW VELOCITY(FEET/SEC.) =  1.08   DEPTH*VELOCITY(FT*FT/SEC.) =   0.97
    *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
          AND L =  994.0 FT WITH ELEVATION-DROP =   0.5 FT, IS   26.0 CFS,
          WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    383.00
    LONGEST FLOWPATH FROM NODE    381.00 TO NODE    383.00 =   1324.00 FEET.

    ****************************************************************************
     FLOW PROCESS FROM NODE    383.00 TO NODE    383.50 IS CODE =  62
    ----------------------------------------------------------------------------
     >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
     >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
    ============================================================================
     UPSTREAM ELEVATION(FEET) =   36.50  DOWNSTREAM ELEVATION(FEET) =   36.00
     STREET LENGTH(FEET) = 1026.00   CURB HEIGHT(INCHES) =  8.0
     STREET HALFWIDTH(FEET) = 42.00

     DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  21.00
     INSIDE STREET CROSSFALL(DECIMAL) =  0.020
     OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

     SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
     STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
     Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
     Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200
```

```
     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      40.22
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) =  0.96
     HALFSTREET FLOOD WIDTH(FEET) =    54.56
     AVERAGE FLOW VELOCITY(FEET/SEC.) =     1.10
     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.05
   STREET FLOW TRAVEL TIME(MIN.) = 15.57   Tc(MIN.) =    41.16
   *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.213
   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"      C       0.10      0.25     0.500     69
   RESIDENTIAL
   "5-7 DWELLINGS/ACRE"      D       6.00      0.20     0.500     75
   APARTMENTS                D       6.80      0.20     0.200     75
   COMMERCIAL                D       0.60      0.20     0.100     75
   URBAN POOR COVER
   "TURF"                    D       0.20      0.20     1.000     87
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.20
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.341
   SUBAREA AREA(ACRES) =   13.70      SUBAREA RUNOFF(CFS) =   14.11
   EFFECTIVE AREA(ACRES) =     38.00    AREA-AVERAGED Fm(INCH/HR) =  0.07
   AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.37
   TOTAL AREA(ACRES) =       38.0       PEAK FLOW RATE(CFS) =      38.96

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 0.95   HALFSTREET FLOOD WIDTH(FEET) =  53.74
   FLOW VELOCITY(FEET/SEC.) =  1.09   DEPTH*VELOCITY(FT*FT/SEC.) =   1.04
   *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L = 1026.0 FT WITH ELEVATION-DROP =   0.5 FT, IS   20.4 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    383.50
   LONGEST FLOWPATH FROM NODE    381.00 TO NODE    383.50 =   2350.00 FEET.

   **************************************************************************
   FLOW PROCESS FROM NODE    383.50 TO NODE    384.00 IS CODE =  31
   --------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
   ==========================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    36.00  DOWNSTREAM(FEET) =    35.50
   FLOW LENGTH(FEET) =    87.00   MANNING'S N =  0.013
   DEPTH OF FLOW IN  36.0 INCH PIPE IS  24.6 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) =   7.56
   ESTIMATED PIPE DIAMETER(INCH) = 36.00    NUMBER OF PIPES =   1
   PIPE-FLOW(CFS) =      38.96
   PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =   41.35
   LONGEST FLOWPATH FROM NODE    381.00 TO NODE    384.00 =   2437.00 FEET.

   **************************************************************************
   FLOW PROCESS FROM NODE    385.00 TO NODE    386.00 IS CODE =  21
   --------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
   >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
   ==========================================================================
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
   ELEVATION DATA: UPSTREAM(FEET) =     37.00  DOWNSTREAM(FEET) =    36.50

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

```
   SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    11.329
   *  10 YEAR RAINFALL INTENSITY(INCH/HR) =   2.541
   SUBAREA Tc AND LOSS RATE DATA(AMC  II):
    DEVELOPMENT TYPE/      SCS SOIL    AREA       Fp         Ap      SCS    Tc
        LAND USE           GROUP    (ACRES)  (INCH/HR)  (DECIMAL)   CN  (MIN.)
   APARTMENTS                 D        4.40      0.20      0.200     75   12.07
   COMMERCIAL                 D        0.80      0.20      0.100     75   11.33
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =   0.20
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.185
   SUBAREA RUNOFF(CFS) =      11.72
   TOTAL AREA(ACRES) =       5.20    PEAK FLOW RATE(CFS) =       11.72


***************************************************************************
   FLOW PROCESS FROM NODE    386.00 TO NODE    387.00 IS CODE =   62
   -------------------------------------------------------------------------
   >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>(STREET TABLE SECTION #   2 USED)<<<<<
   =========================================================================
   UPSTREAM ELEVATION(FEET) =    36.50  DOWNSTREAM ELEVATION(FEET) =    36.00
   STREET LENGTH(FEET) =    284.00   CURB HEIGHT(INCHES) =   8.0
   STREET HALFWIDTH(FEET) = 42.00

   DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   21.00
   INSIDE STREET CROSSFALL(DECIMAL) =   0.020
   OUTSIDE STREET CROSSFALL(DECIMAL)  =   0.020

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =   2
   STREET PARKWAY CROSSFALL(DECIMAL)  =   0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       16.13
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) =  0.61
     HALFSTREET FLOOD WIDTH(FEET) =    22.44
     AVERAGE FLOW VELOCITY(FEET/SEC.) =     1.54
     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =     0.94
   STREET FLOW TRAVEL TIME(MIN.) =    3.06   Tc(MIN.) =    14.39
   *  10 YEAR RAINFALL INTENSITY(INCH/HR) =   2.215
   SUBAREA LOSS RATE DATA(AMC  II):
    DEVELOPMENT TYPE/      SCS SOIL    AREA       Fp         Ap      SCS
        LAND USE           GROUP    (ACRES)  (INCH/HR)  (DECIMAL)   CN
   APARTMENTS                 D        3.80      0.20      0.200     75
   COMMERCIAL                 D        0.70      0.20      0.100     75
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =   0.20
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.184
   SUBAREA AREA(ACRES) =     4.50       SUBAREA RUNOFF(CFS) =     8.82
   EFFECTIVE AREA(ACRES) =       9.70     AREA-AVERAGED Fm(INCH/HR) =  0.04
   AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.18
   TOTAL AREA(ACRES) =        9.7         PEAK FLOW RATE(CFS) =      19.01

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 0.64   HALFSTREET FLOOD WIDTH(FEET) =   23.91
   FLOW VELOCITY(FEET/SEC.) = 1.61   DEPTH*VELOCITY(FT*FT/SEC.) =   1.02
   LONGEST FLOWPATH FROM NODE    385.00 TO NODE    387.00 =    614.00 FEET.

***************************************************************************
   FLOW PROCESS FROM NODE    387.00 TO NODE    388.00 IS CODE =   41
   ----------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    24.72  DOWNSTREAM(FEET) =    24.29
  FLOW LENGTH(FEET) =   432.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  24.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.31
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       19.01
  PIPE TRAVEL TIME(MIN.) =   2.17    Tc(MIN.) =   16.57
  LONGEST FLOWPATH FROM NODE    385.00 TO NODE    388.00 =    1046.00 FEET.


*******************************************************************************
  FLOW PROCESS FROM NODE    388.00 TO NODE    388.00 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
  MAINLINE Tc(MIN.) =   16.57
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.043
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
  APARTMENTS               D        5.50     0.20      0.200    75
  COMMERCIAL               D        1.40     0.20      0.100    75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =   0.20
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.180
  SUBAREA AREA(ACRES) =    6.90       SUBAREA RUNOFF(CFS) =   12.47
  EFFECTIVE AREA(ACRES) =     16.60   AREA-AVERAGED Fm(INCH/HR) =  0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.20  AREA-AVERAGED Ap =  0.18
  TOTAL AREA(ACRES) =        16.6       PEAK FLOW RATE(CFS) =       29.98


*******************************************************************************
  FLOW PROCESS FROM NODE    388.00 TO NODE    388.10 IS CODE =  41
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    24.29  DOWNSTREAM(FEET) =    23.19
  FLOW LENGTH(FEET) =  1100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  54.0 INCH PIPE IS  27.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.72
  GIVEN PIPE DIAMETER(INCH) =  54.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       29.98
  PIPE TRAVEL TIME(MIN.) =   4.92    Tc(MIN.) =   21.49
  LONGEST FLOWPATH FROM NODE    385.00 TO NODE    388.10 =    2146.00 FEET.


*******************************************************************************
  FLOW PROCESS FROM NODE    388.10 TO NODE    388.10 IS CODE =  81
-------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
================================================================================
  MAINLINE Tc(MIN.) =   21.49
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.760
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE           GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL               C       10.13     0.25      0.100    69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =   0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =   10.13       SUBAREA RUNOFF(CFS) =   15.82
  EFFECTIVE AREA(ACRES) =     26.73   AREA-AVERAGED Fm(INCH/HR) =  0.03
```

```
   AREA-AVERAGED Fp(INCH/HR) =  0.21  AREA-AVERAGED Ap =   0.15
   TOTAL AREA(ACRES) =          26.7       PEAK FLOW RATE(CFS) =       41.58


   *************************************************************************
   FLOW PROCESS FROM NODE     388.10 TO NODE     388.10 IS CODE =   81
   -------------------------------------------------------------------------
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
   =========================================================================
   MAINLINE Tc(MIN.) =    21.49
   *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.760
   SUBAREA LOSS RATE DATA(AMC  II):
    DEVELOPMENT TYPE/       SCS SOIL    AREA       Fp          Ap     SCS
        LAND USE             GROUP    (ACRES)  (INCH/HR)  (DECIMAL)   CN
   COMMERCIAL                  C        3.87      0.25       0.100     69
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =   0.25
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
   SUBAREA AREA(ACRES) =     3.87       SUBAREA RUNOFF(CFS) =     6.04
   EFFECTIVE AREA(ACRES) =      30.60   AREA-AVERAGED Fm(INCH/HR) =  0.03
   AREA-AVERAGED Fp(INCH/HR) =  0.22  AREA-AVERAGED Ap =   0.14
   TOTAL AREA(ACRES) =          30.6       PEAK FLOW RATE(CFS) =       47.62


   *************************************************************************
   FLOW PROCESS FROM NODE     388.10 TO NODE     388.20 IS CODE =   41
   -------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
   =========================================================================
   ELEVATION DATA: UPSTREAM(FEET) =     23.19  DOWNSTREAM(FEET) =     22.48
   FLOW LENGTH(FEET) =    225.00   MANNING'S N =  0.013
   DEPTH OF FLOW IN  63.0 INCH PIPE IS  23.7 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) =    6.39
   GIVEN PIPE DIAMETER(INCH) =  63.00    NUMBER OF PIPES =    1
   PIPE-FLOW(CFS) =       47.62
   PIPE TRAVEL TIME(MIN.) =   0.59    Tc(MIN.) =    22.08
   LONGEST FLOWPATH FROM NODE     385.00 TO NODE     388.20 =    2371.00 FEET.


   *************************************************************************
   FLOW PROCESS FROM NODE     388.20 TO NODE     388.20 IS CODE =   81
   -------------------------------------------------------------------------
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
   =========================================================================
   MAINLINE Tc(MIN.) =    22.08
   *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.733
   SUBAREA LOSS RATE DATA(AMC  II):
    DEVELOPMENT TYPE/       SCS SOIL    AREA       Fp          Ap     SCS
        LAND USE             GROUP    (ACRES)  (INCH/HR)  (DECIMAL)   CN
   COMMERCIAL                  C       10.24      0.25       0.100     69
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =   0.25
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
   SUBAREA AREA(ACRES) =    10.24       SUBAREA RUNOFF(CFS) =    15.74
   EFFECTIVE AREA(ACRES) =      40.84   AREA-AVERAGED Fm(INCH/HR) =  0.03
   AREA-AVERAGED Fp(INCH/HR) =  0.22  AREA-AVERAGED Ap =   0.13
   TOTAL AREA(ACRES) =          40.8       PEAK FLOW RATE(CFS) =       62.62


   *************************************************************************
   FLOW PROCESS FROM NODE     388.20 TO NODE     389.00 IS CODE =   41
   -------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
   =========================================================================
```

```
ELEVATION DATA: UPSTREAM(FEET) =    22.48  DOWNSTREAM(FEET) =    22.04
FLOW LENGTH(FEET) =   438.00   MANNING'S N =  0.013
DEPTH OF FLOW IN  63.0 INCH PIPE IS  38.9 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =   4.46
GIVEN PIPE DIAMETER(INCH) =  63.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =        62.62
PIPE TRAVEL TIME(MIN.) =   1.64    Tc(MIN.) =   23.71
LONGEST FLOWPATH FROM NODE     385.00 TO NODE     389.00 =    2809.00 FEET.


**************************************************************************
FLOW PROCESS FROM NODE    389.00 TO NODE    389.00 IS CODE =  81
--------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
MAINLINE Tc(MIN.) =   23.71
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.664
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL    AREA       Fp         Ap      SCS
     LAND USE            GROUP    (ACRES)  (INCH/HR) (DECIMAL)   CN
COMMERCIAL                 C       32.76     0.25      0.100     69
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
SUBAREA AREA(ACRES) =   32.76     SUBAREA RUNOFF(CFS) =   48.32
EFFECTIVE AREA(ACRES) =    73.60   AREA-AVERAGED Fm(INCH/HR) =  0.03
AREA-AVERAGED Fp(INCH/HR) =  0.23  AREA-AVERAGED Ap =  0.12
TOTAL AREA(ACRES) =       73.6      PEAK FLOW RATE(CFS) =     108.38


**************************************************************************
FLOW PROCESS FROM NODE    389.20 TO NODE    389.20 IS CODE =  81
--------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
MAINLINE Tc(MIN.) =   23.71
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.664
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           C       23.64     0.25      0.250     69
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.250
SUBAREA AREA(ACRES) =   23.64     SUBAREA RUNOFF(CFS) =   34.07
EFFECTIVE AREA(ACRES) =    97.24   AREA-AVERAGED Fm(INCH/HR) =  0.04
AREA-AVERAGED Fp(INCH/HR) =  0.24  AREA-AVERAGED Ap =  0.15
TOTAL AREA(ACRES) =       97.2      PEAK FLOW RATE(CFS) =     142.45


**************************************************************************
FLOW PROCESS FROM NODE    389.10 TO NODE    389.10 IS CODE =  81
--------------------------------------------------------------------------
>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
MAINLINE Tc(MIN.) =   23.71
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.664
SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/       SCS SOIL    AREA       Fp         Ap      SCS
     LAND USE            GROUP    (ACRES)  (INCH/HR) (DECIMAL)   CN
COMMERCIAL                 C       21.01     0.25      0.100     69
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
SUBAREA AREA(ACRES) =   21.01     SUBAREA RUNOFF(CFS) =   30.99
EFFECTIVE AREA(ACRES) =   118.25   AREA-AVERAGED Fm(INCH/HR) =  0.03
```

AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap =   0.14
TOTAL AREA(ACRES) =   118.2   PEAK FLOW RATE(CFS) =   173.44

****
FLOW PROCESS FROM NODE   390.00 TO NODE   391.00 IS CODE =   21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==
INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
ELEVATION DATA: UPSTREAM(FEET) =   35.00 DOWNSTREAM(FEET) =   34.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   9.862
* 10 YEAR RAINFALL INTENSITY(INCH/HR) =   2.751
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
APARTMENTS	C	0.10	0.25	0.200	69	10.51
APARTMENTS	D	3.00	0.20	0.200	75	10.51
COMMERCIAL	D	0.20	0.20	0.100	75	9.86

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.194
SUBAREA RUNOFF(CFS) =   8.05
TOTAL AREA(ACRES) =   3.30   PEAK FLOW RATE(CFS) =   8.05

****
FLOW PROCESS FROM NODE   391.00 TO NODE   392.00 IS CODE =   62

>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STREET TABLE SECTION # 1 USED)<<<<<
==
UPSTREAM ELEVATION(FEET) =   34.00 DOWNSTREAM ELEVATION(FEET) =   33.50
STREET LENGTH(FEET) =   595.00   CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

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

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =   2
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   15.73
STREET FLOWING FULL
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.61
HALFSTREET FLOOD WIDTH(FEET) =   25.66
AVERAGE FLOW VELOCITY(FEET/SEC.) =   1.23
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   0.75
STREET FLOW TRAVEL TIME(MIN.) = 8.08   Tc(MIN.) =   17.94
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.952
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
APARTMENTS	D	8.60	0.20	0.200	75
COMMERCIAL	D	0.20	0.20	0.100	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20

SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.198
SUBAREA AREA(ACRES) =   8.80   SUBAREA RUNOFF(CFS) =   15.15
EFFECTIVE AREA(ACRES) =   12.10   AREA-AVERAGED Fm(INCH/HR) =   0.04
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap =   0.20
TOTAL AREA(ACRES) =   12.1   PEAK FLOW RATE(CFS) =   20.83

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.67   HALFSTREET FLOOD WIDTH(FEET) = 28.29
FLOW VELOCITY(FEET/SEC.) = 1.33   DEPTH*VELOCITY(FT*FT/SEC.) =   0.89
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
      AND L = 595.0 FT WITH ELEVATION-DROP =   0.5 FT, IS   16.1 CFS,
      WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   392.00
LONGEST FLOWPATH FROM NODE   390.00 TO NODE   392.00 =   925.00 FEET.

****
FLOW PROCESS FROM NODE   392.00 TO NODE   393.00 IS CODE = 62

>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STREET TABLE SECTION # 1 USED)<<<<<
===
UPSTREAM ELEVATION(FEET) =   33.50 DOWNSTREAM ELEVATION(FEET) =   33.00
STREET LENGTH(FEET) =   723.00   CURB HEIGHT(INCHES) =   6.0
STREET HALFWIDTH(FEET) = 20.00

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

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =   2
STREET PARKWAY CROSSFALL(DECIMAL) =   0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   32.42
  STREET FLOWING FULL
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) = 0.79
  HALFSTREET FLOOD WIDTH(FEET) =   34.45
  AVERAGE FLOW VELOCITY(FEET/SEC.) =   1.39
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.09
STREET FLOW TRAVEL TIME(MIN.) =   8.69   Tc(MIN.) =   26.63
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.557
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
APARTMENTS	D	16.20	0.20	0.200	75
COMMERCIAL	D	0.70	0.20	0.100	75

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.20
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.196
SUBAREA AREA(ACRES) =   16.90   SUBAREA RUNOFF(CFS) =   23.08
EFFECTIVE AREA(ACRES) =   29.00   AREA-AVERAGED Fm(INCH/HR) =   0.04
AREA-AVERAGED Fp(INCH/HR) = 0.20 AREA-AVERAGED Ap =   0.20
TOTAL AREA(ACRES) =   29.0   PEAK FLOW RATE(CFS) =   39.60

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.84   HALFSTREET FLOOD WIDTH(FEET) = 37.20
FLOW VELOCITY(FEET/SEC.) = 1.45   DEPTH*VELOCITY(FT*FT/SEC.) =   1.22
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
      AND L = 723.0 FT WITH ELEVATION-DROP =   0.5 FT, IS   28.9 CFS,
      WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   393.00

LONGEST FLOWPATH FROM NODE   390.00 TO NODE   393.00 =   1648.00 FEET.

****
  FLOW PROCESS FROM NODE   393.00 TO NODE   397.00 IS CODE =   31

  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===
  ELEVATION DATA: UPSTREAM(FEET) =   33.00 DOWNSTREAM(FEET) =   32.50
  FLOW LENGTH(FEET) = 1865.00   MANNING'S N = 0.013
  DEPTH OF FLOW IN 60.0 INCH PIPE IS 48.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.35
  ESTIMATED PIPE DIAMETER(INCH) = 60.00   NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =   39.60
  PIPE TRAVEL TIME(MIN.) = 13.24   Tc(MIN.) =   39.87
  LONGEST FLOWPATH FROM NODE   390.00 TO NODE   397.00 =   3513.00 FEET.

****
  FLOW PROCESS FROM NODE   397.00 TO NODE   397.00 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.) =   39.87
  RAINFALL INTENSITY(INCH/HR) =   1.24
  AREA-AVERAGED Fm(INCH/HR) = 0.04
  AREA-AVERAGED Fp(INCH/HR) = 0.20
  AREA-AVERAGED Ap = 0.20
  EFFECTIVE STREAM AREA(ACRES) =   29.00
  TOTAL STREAM AREA(ACRES) =   29.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   39.60

****
  FLOW PROCESS FROM NODE   395.00 TO NODE   396.00 IS CODE =   21

  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
===
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =   396.00 DOWNSTREAM(FEET) =   395.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   9.862
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) =   2.751
  SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
COMMERCIAL	C	0.46	0.25	0.100	69	9.86

  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
  SUBAREA RUNOFF(CFS) =   1.13
  TOTAL AREA(ACRES) =   0.46   PEAK FLOW RATE(CFS) =   1.13

****
  FLOW PROCESS FROM NODE   396.00 TO NODE   396.00 IS CODE =   81

  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
===
  MAINLINE Tc(MIN.) =   9.86

```
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.751
   SUBAREA LOSS RATE DATA(AMC  II):
    DEVELOPMENT TYPE/        SCS SOIL    AREA       Fp          Ap      SCS
        LAND USE            GROUP    (ACRES)   (INCH/HR)  (DECIMAL)   CN
   COMMERCIAL                  C        1.16      0.25       0.100     69
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =   0.25
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
   SUBAREA AREA(ACRES) =     1.16      SUBAREA RUNOFF(CFS) =     2.85
   EFFECTIVE AREA(ACRES) =       1.62   AREA-AVERAGED Fm(INCH/HR) =  0.03
   AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =   0.10
   TOTAL AREA(ACRES) =         1.6        PEAK FLOW RATE(CFS) =       3.97


 **************************************************************************
   FLOW PROCESS FROM NODE    396.00 TO NODE    396.10 IS CODE =   41
 --------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
 ==========================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    25.62  DOWNSTREAM(FEET) =    25.41
   FLOW LENGTH(FEET) =   205.00   MANNING'S N =  0.013
   DEPTH OF FLOW IN  36.0 INCH PIPE IS  10.8 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) =    2.23
   GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =    1
   PIPE-FLOW(CFS) =        3.97
   PIPE TRAVEL TIME(MIN.) =   1.54    Tc(MIN.) =    11.40
   LONGEST FLOWPATH FROM NODE    395.00 TO NODE    396.10 =     535.00 FEET.


 **************************************************************************
   FLOW PROCESS FROM NODE    396.10 TO NODE    396.10 IS CODE =   81
 --------------------------------------------------------------------------
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
 ==========================================================================
   MAINLINE Tc(MIN.) =   11.40
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.532
   SUBAREA LOSS RATE DATA(AMC  II):
    DEVELOPMENT TYPE/        SCS SOIL    AREA       Fp          Ap      SCS
        LAND USE            GROUP    (ACRES)   (INCH/HR)  (DECIMAL)   CN
   COMMERCIAL                  C        7.89      0.25       0.100     69
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =   0.25
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
   SUBAREA AREA(ACRES) =     7.89      SUBAREA RUNOFF(CFS) =    17.80
   EFFECTIVE AREA(ACRES) =       9.51   AREA-AVERAGED Fm(INCH/HR) =  0.02
   AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =   0.10
   TOTAL AREA(ACRES) =         9.5        PEAK FLOW RATE(CFS) =      21.46


 **************************************************************************
   FLOW PROCESS FROM NODE    396.10 TO NODE    396.20 IS CODE =   41
 --------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
 ==========================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    25.41  DOWNSTREAM(FEET) =    24.94
   FLOW LENGTH(FEET) =   385.00   MANNING'S N =  0.013
   DEPTH OF FLOW IN  36.0 INCH PIPE IS  28.6 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) =    3.56
   GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =    1
   PIPE-FLOW(CFS) =       21.46
   PIPE TRAVEL TIME(MIN.) =   1.80    Tc(MIN.) =    13.20
   LONGEST FLOWPATH FROM NODE    395.00 TO NODE    396.20 =     920.00 FEET.
```

```
****************************************************************************
   FLOW PROCESS FROM NODE    396.20 TO NODE    396.20 IS CODE =   81
   ----------------------------------------------------------------------------
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
   ========================================================================
   MAINLINE Tc(MIN.) =   13.20
   *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.328
   SUBAREA LOSS RATE DATA(AMC  II):
    DEVELOPMENT TYPE/      SCS SOIL   AREA       Fp         Ap     SCS
        LAND USE            GROUP   (ACRES)   (INCH/HR)  (DECIMAL)  CN
   COMMERCIAL                 C       7.80      0.25      0.100     69
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =   0.25
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
   SUBAREA AREA(ACRES) =    7.80      SUBAREA RUNOFF(CFS) =   16.16
   EFFECTIVE AREA(ACRES) =     17.31   AREA-AVERAGED Fm(INCH/HR) =  0.02
   AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.10
   TOTAL AREA(ACRES) =         17.3      PEAK FLOW RATE(CFS) =      35.87


****************************************************************************
   FLOW PROCESS FROM NODE    396.20 TO NODE    396.30 IS CODE =   41
   ----------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
   ========================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    24.94  DOWNSTREAM(FEET) =    24.72
   FLOW LENGTH(FEET) =   150.33   MANNING'S N =  0.013
   ASSUME FULL-FLOWING PIPELINE
   PIPE-FLOW VELOCITY(FEET/SEC.) =   4.32
   PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
   GIVEN PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
   PIPE-FLOW(CFS) =        35.87
   PIPE TRAVEL TIME(MIN.) =   0.58    Tc(MIN.) =   13.78
   LONGEST FLOWPATH FROM NODE    395.00 TO NODE    396.30 =    1070.33 FEET.


****************************************************************************
   FLOW PROCESS FROM NODE    396.30 TO NODE    396.30 IS CODE =   81
   ----------------------------------------------------------------------------
   >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
   ========================================================================
   MAINLINE Tc(MIN.) =   13.78
   *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.271
   SUBAREA LOSS RATE DATA(AMC  II):
    DEVELOPMENT TYPE/      SCS SOIL   AREA       Fp         Ap     SCS
        LAND USE            GROUP   (ACRES)   (INCH/HR)  (DECIMAL)  CN
   COMMERCIAL                 C      13.06      0.25      0.100     69
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =   0.25
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
   SUBAREA AREA(ACRES) =   13.06      SUBAREA RUNOFF(CFS) =   26.40
   EFFECTIVE AREA(ACRES) =     30.37   AREA-AVERAGED Fm(INCH/HR) =  0.02
   AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.10
   TOTAL AREA(ACRES) =         30.4      PEAK FLOW RATE(CFS) =      61.39


****************************************************************************
   FLOW PROCESS FROM NODE    396.30 TO NODE    397.00 IS CODE =   41
   ----------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
   ========================================================================
   ELEVATION DATA: UPSTREAM(FEET) =    24.72  DOWNSTREAM(FEET) =    24.65
   FLOW LENGTH(FEET) =   285.00   MANNING'S N =  0.013
```

```
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY(FEET/SEC.) =    6.38
PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =    1
PIPE-FLOW(CFS) =       61.39
PIPE TRAVEL TIME(MIN.) =   0.74    Tc(MIN.) =   14.52
LONGEST FLOWPATH FROM NODE     395.00 TO NODE     397.00 =     1355.33 FEET.


****************************************************************************
FLOW PROCESS FROM NODE     397.00 TO NODE     397.00 IS CODE =    1
----------------------------------------------------------------------------
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
TIME OF CONCENTRATION(MIN.) =   14.52
RAINFALL INTENSITY(INCH/HR) =    2.20
AREA-AVERAGED Fm(INCH/HR) =  0.02
AREA-AVERAGED Fp(INCH/HR) =  0.25
AREA-AVERAGED Ap =  0.10
EFFECTIVE STREAM AREA(ACRES) =       30.37
TOTAL STREAM AREA(ACRES) =       30.37
PEAK FLOW RATE(CFS) AT CONFLUENCE =       61.39
```

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	39.60	39.87	1.235	0.20(0.04)	0.20	29.0	390.00
2	61.39	14.52	2.204	0.25(0.02)	0.10	30.4	395.00

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	87.49	14.52	2.204	0.23(0.03)	0.12	40.9	395.00
2	73.71	39.87	1.235	0.22(0.03)	0.15	59.4	390.00

```
COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =       87.49    Tc(MIN.) =    14.52
EFFECTIVE AREA(ACRES) =       40.93    AREA-AVERAGED Fm(INCH/HR) =   0.03
AREA-AVERAGED Fp(INCH/HR) =  0.23  AREA-AVERAGED Ap =   0.12
TOTAL AREA(ACRES) =       59.4
LONGEST FLOWPATH FROM NODE     390.00 TO NODE     397.00 =     3513.00 FEET.


****************************************************************************
FLOW PROCESS FROM NODE     397.00 TO NODE     397.10 IS CODE =   41
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =    24.65  DOWNSTREAM(FEET) =    24.32
FLOW LENGTH(FEET) =   332.00   MANNING'S N =  0.013
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY(FEET/SEC.) =    5.50
PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
GIVEN PIPE DIAMETER(INCH) =  54.00    NUMBER OF PIPES =    1
PIPE-FLOW(CFS) =       87.49
```

```
  PIPE TRAVEL TIME(MIN.) =   1.01    Tc(MIN.) =    15.53
  LONGEST FLOWPATH FROM NODE     390.00 TO NODE     397.10 =    3845.00 FEET.


**************************************************************************
  FLOW PROCESS FROM NODE     397.10 TO NODE     397.10 IS CODE =   81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  MAINLINE Tc(MIN.) =    15.53
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =   2.121
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL    AREA       Fp        Ap      SCS
       LAND USE            GROUP    (ACRES)  (INCH/HR) (DECIMAL)   CN
  MOBILE HOME PARK            C       19.02     0.25      0.250     69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =   0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.250
  SUBAREA AREA(ACRES) =    19.02      SUBAREA RUNOFF(CFS) =    35.23
  EFFECTIVE AREA(ACRES) =      59.95   AREA-AVERAGED Fm(INCH/HR) =   0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.24  AREA-AVERAGED Ap =   0.16
  TOTAL AREA(ACRES) =         78.4      PEAK FLOW RATE(CFS) =      112.30


**************************************************************************
  FLOW PROCESS FROM NODE     397.10 TO NODE     397.20 IS CODE =   41
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    24.32  DOWNSTREAM(FEET) =    24.02
  FLOW LENGTH(FEET) =   299.00   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.06
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  54.00     NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      112.30
  PIPE TRAVEL TIME(MIN.) =   0.71    Tc(MIN.) =    16.23
  LONGEST FLOWPATH FROM NODE     390.00 TO NODE     397.20 =    4144.00 FEET.


**************************************************************************
  FLOW PROCESS FROM NODE     397.20 TO NODE     397.20 IS CODE =   81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
  MAINLINE Tc(MIN.) =    16.23
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =   2.067
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL    AREA       Fp        Ap      SCS
       LAND USE            GROUP    (ACRES)  (INCH/HR) (DECIMAL)   CN
  MOBILE HOME PARK            C        0.76     0.25      0.250     69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =   0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.250
  SUBAREA AREA(ACRES) =     0.76      SUBAREA RUNOFF(CFS) =     1.37
  EFFECTIVE AREA(ACRES) =      60.71   AREA-AVERAGED Fm(INCH/HR) =   0.04
  AREA-AVERAGED Fp(INCH/HR) =  0.24  AREA-AVERAGED Ap =   0.17
  TOTAL AREA(ACRES) =         79.2      PEAK FLOW RATE(CFS) =      112.30
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE


**************************************************************************
  FLOW PROCESS FROM NODE     397.20 TO NODE     397.30 IS CODE =   41
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

196

>>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<

==
ELEVATION DATA: UPSTREAM(FEET) =   24.02 DOWNSTREAM(FEET) =   23.40
FLOW LENGTH(FEET) =   615.00   MANNING'S N = 0.013
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY(FEET/SEC.) =   7.06
PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
GIVEN PIPE DIAMETER(INCH) = 54.00   NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =   112.30
PIPE TRAVEL TIME(MIN.) =   1.45   Tc(MIN.) =   17.69
LONGEST FLOWPATH FROM NODE   390.00 TO NODE   397.30 =   4759.00 FEET.

****
FLOW PROCESS FROM NODE   397.30 TO NODE   397.30 IS CODE =   81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<

==
MAINLINE Tc(MIN.) =   17.69
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.968
SUBAREA LOSS RATE DATA(AMC II):
 DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
      LAND USE   GROUP   (ACRES) (INCH/HR) (DECIMAL)   CN
MOBILE HOME PARK   C   7.41   0.25   0.250   69
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =   0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.250
SUBAREA AREA(ACRES) =   7.41   SUBAREA RUNOFF(CFS) =   12.71
EFFECTIVE AREA(ACRES) =   68.12   AREA-AVERAGED Fm(INCH/HR) =   0.04
AREA-AVERAGED Fp(INCH/HR) = 0.24 AREA-AVERAGED Ap =   0.17
TOTAL AREA(ACRES) =   86.6   PEAK FLOW RATE(CFS) =   118.09

****
FLOW PROCESS FROM NODE   397.30 TO NODE   398.00 IS CODE =   41

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<

==
ELEVATION DATA: UPSTREAM(FEET) =   23.35 DOWNSTREAM(FEET) =   20.20
FLOW LENGTH(FEET) =   833.00   MANNING'S N = 0.013
DEPTH OF FLOW IN 60.0 INCH PIPE IS 39.8 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =   8.55
GIVEN PIPE DIAMETER(INCH) = 60.00   NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =   118.09
PIPE TRAVEL TIME(MIN.) =   1.62   Tc(MIN.) =   19.31
LONGEST FLOWPATH FROM NODE   390.00 TO NODE   398.00 =   5592.00 FEET.

****
FLOW PROCESS FROM NODE   399.10 TO NODE   399.20 IS CODE =   21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==
INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
ELEVATION DATA: UPSTREAM(FEET) =   110.00 DOWNSTREAM(FEET) =   108.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   8.586
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.978
SUBAREA Tc 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   2.60   0.30   0.500   56   10.99
RESIDENTIAL
"5-7 DWELLINGS/ACRE"   C   3.60   0.25   0.500   69   10.99
NATURAL FAIR COVER
"OPEN BRUSH"   C   0.90   0.25   1.000   77   19.94
COMMERCIAL   B   0.80   0.30   0.100   56   8.59
COMMERCIAL   C   1.40   0.25   0.100   69   8.59
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.454
SUBAREA RUNOFF(CFS) =   23.91
TOTAL AREA(ACRES) =   9.30   PEAK FLOW RATE(CFS) =   23.91

****
  FLOW PROCESS FROM NODE   399.20 TO NODE   399.30 IS CODE = 62

  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 3 USED)<<<<<
==
  UPSTREAM ELEVATION(FEET) = 108.00 DOWNSTREAM ELEVATION(FEET) = 105.00
  STREET LENGTH(FEET) =   510.00   CURB HEIGHT(INCHES) = 8.0
  STREET HALFWIDTH(FEET) = 51.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 25.00
  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   40.31
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) = 0.81
    HALFSTREET FLOOD WIDTH(FEET) =   40.15
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   3.51
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   2.86
  STREET FLOW TRAVEL TIME(MIN.) =   2.42   Tc(MIN.) =   11.01
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.583
  SUBAREA LOSS RATE DATA(AMC II):
   DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
       LAND USE   GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"   B   4.30   0.30   0.500   56
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"   C   5.90   0.25   0.500   69
  NATURAL FAIR COVER
  "OPEN BRUSH"   C   1.50   0.25   1.000   77
  COMMERCIAL   B   1.10   0.30   0.100   56
  COMMERCIAL   C   2.00   0.25   0.100   69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.27
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.467
  SUBAREA AREA(ACRES) =   14.80   SUBAREA RUNOFF(CFS) =   32.75
  EFFECTIVE AREA(ACRES) =   24.10   AREA-AVERAGED Fm(INCH/HR) = 0.12
  AREA-AVERAGED Fp(INCH/HR) = 0.27 AREA-AVERAGED Ap = 0.46
  TOTAL AREA(ACRES) =   24.1   PEAK FLOW RATE(CFS) =   53.35

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.88   HALFSTREET FLOOD WIDTH(FEET) = 46.99

```
    FLOW VELOCITY(FEET/SEC.) = 3.69   DEPTH*VELOCITY(FT*FT/SEC.) =   3.26
    *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
           AND L =  510.0 FT WITH ELEVATION-DROP =   3.0 FT, IS   34.1 CFS,
           WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    399.30
    LONGEST FLOWPATH FROM NODE    399.10 TO NODE    399.30 =    840.00 FEET.


    **************************************************************************
      FLOW PROCESS FROM NODE    399.30 TO NODE    399.40 IS CODE =  62
    --------------------------------------------------------------------------
      >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
      >>>>>(STREET TABLE SECTION #  3 USED)<<<<<
    ==========================================================================
      UPSTREAM ELEVATION(FEET) = 105.00  DOWNSTREAM ELEVATION(FEET) =  104.00
      STREET LENGTH(FEET) =   698.00   CURB HEIGHT(INCHES) =  8.0
      STREET HALFWIDTH(FEET) = 51.00

      DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  25.00
      INSIDE STREET CROSSFALL(DECIMAL) =  0.020
      OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

      SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
      STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
      Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
      Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

        **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      69.95
        STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
        STREET FLOW DEPTH(FEET) =  0.96
        HALFSTREET FLOOD WIDTH(FEET) =   54.61
        AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.91
        PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.83
      STREET FLOW TRAVEL TIME(MIN.) =   6.10   Tc(MIN.) =   17.10
      *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.006
      SUBAREA LOSS RATE DATA(AMC  II):
```

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	B	1.30	0.30	0.500	56
COMMERCIAL	B	0.90	0.30	0.100	56
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	8.60	0.25	0.500	69
COMMERCIAL	C	3.90	0.25	0.100	69
NATURAL FAIR COVER					
"OPEN BRUSH"	C	1.10	0.25	1.000	77
COMMERCIAL	C	3.40	0.25	0.100	69

```
      SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.26
      SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.358
      SUBAREA AREA(ACRES) =   19.20      SUBAREA RUNOFF(CFS) =   33.09
      EFFECTIVE AREA(ACRES) =    43.30    AREA-AVERAGED Fm(INCH/HR) =  0.11
      AREA-AVERAGED Fp(INCH/HR) =  0.26  AREA-AVERAGED Ap =  0.42
      TOTAL AREA(ACRES) =      43.3       PEAK FLOW RATE(CFS) =      73.94

      END OF SUBAREA STREET FLOW HYDRAULICS:
      DEPTH(FEET) = 0.97   HALFSTREET FLOOD WIDTH(FEET) =  55.97
      FLOW VELOCITY(FEET/SEC.) = 1.94   DEPTH*VELOCITY(FT*FT/SEC.) =   1.88
      *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
             AND L =  698.0 FT WITH ELEVATION-DROP =   1.0 FT, IS   35.2 CFS,
             WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    399.40
      LONGEST FLOWPATH FROM NODE    399.10 TO NODE    399.40 =   1538.00 FEET.
```

```
**************************************************************************
  FLOW PROCESS FROM NODE    399.40 TO NODE    399.80 IS CODE =  31
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   104.00  DOWNSTREAM(FEET) =   100.00
  FLOW LENGTH(FEET) =   653.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  34.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.85
  ESTIMATED PIPE DIAMETER(INCH) = 42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       73.94
  PIPE TRAVEL TIME(MIN.) =   1.23    Tc(MIN.) =   18.33
  LONGEST FLOWPATH FROM NODE    399.10 TO NODE    399.80 =    2191.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    399.80 TO NODE    399.80 IS CODE =   1
--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   18.33
  RAINFALL INTENSITY(INCH/HR) =   1.93
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.26
  AREA-AVERAGED Ap =  0.42
  EFFECTIVE STREAM AREA(ACRES) =      43.30
  TOTAL STREAM AREA(ACRES) =      43.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      73.94

**************************************************************************
  FLOW PROCESS FROM NODE    399.50 TO NODE    399.60 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   246.00
  ELEVATION DATA: UPSTREAM(FEET) =    108.00  DOWNSTREAM(FEET) =    107.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.269
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.043
  SUBAREA Tc 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"       C       0.10      0.25      0.500     69   10.58
  COMMERCIAL                 C       0.80      0.25      0.100     69    8.27
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.144
  SUBAREA RUNOFF(CFS) =       2.44
  TOTAL AREA(ACRES) =       0.90   PEAK FLOW RATE(CFS) =       2.44

**************************************************************************
  FLOW PROCESS FROM NODE    399.60 TO NODE    399.70 IS CODE =  62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
```

GC10EX
   UPSTREAM ELEVATION(FEET) = 107.00 DOWNSTREAM ELEVATION(FEET) = 102.00
   STREET LENGTH(FEET) =   775.00   CURB HEIGHT(INCHES) = 6.0
   STREET HALFWIDTH(FEET) = 20.00

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

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
   STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   10.16
     STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
     STREET FLOW DEPTH(FEET) = 0.41
     HALFSTREET FLOOD WIDTH(FEET) =   14.49
     AVERAGE FLOW VELOCITY(FEET/SEC.) =   2.26
     PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   0.92
   STREET FLOW TRAVEL TIME(MIN.) =   5.71   Tc(MIN.) =   13.98
   * 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"   C   6.40   0.25   0.500   69
   COMMERCIAL   C   1.50   0.25   0.100   69
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.424
   SUBAREA AREA(ACRES) =   7.90   SUBAREA RUNOFF(CFS) =   15.26
   EFFECTIVE AREA(ACRES) =   8.80   AREA-AVERAGED Fm(INCH/HR) = 0.10
   AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.40
   TOTAL AREA(ACRES) =   8.8   PEAK FLOW RATE(CFS) =   17.05

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 0.47   HALFSTREET FLOOD WIDTH(FEET) = 17.85
   FLOW VELOCITY(FEET/SEC.) = 2.56   DEPTH*VELOCITY(FT*FT/SEC.) =   1.21
   LONGEST FLOWPATH FROM NODE   399.50 TO NODE   399.70 =   1021.00 FEET.

   ****
   FLOW PROCESS FROM NODE   399.70 TO NODE   399.80 IS CODE = 62

   >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>(STREET TABLE SECTION # 1 USED)<<<<<
   ==
   UPSTREAM ELEVATION(FEET) = 102.00 DOWNSTREAM ELEVATION(FEET) = 100.00
   STREET LENGTH(FEET) =   672.00   CURB HEIGHT(INCHES) = 6.0
   STREET HALFWIDTH(FEET) = 20.00

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

   SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
   STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
   Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
   Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

     **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   23.97
     STREET FLOWING FULL
                                        201

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   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.58
   HALFSTREET FLOOD WIDTH(FEET) =   23.89
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.17
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.25
 STREET FLOW TRAVEL TIME(MIN.) =   5.17   Tc(MIN.) =   19.15
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.881
 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"       C       2.40      0.25     0.500    69
 COMMERCIAL                 C       6.00      0.25     0.100    69
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.214
 SUBAREA AREA(ACRES) =     8.40      SUBAREA RUNOFF(CFS) =   13.81
 EFFECTIVE AREA(ACRES) =     17.20    AREA-AVERAGED Fm(INCH/HR) =  0.08
 AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.31
 TOTAL AREA(ACRES) =       17.2       PEAK FLOW RATE(CFS) =     27.92

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.60   HALFSTREET FLOOD WIDTH(FEET) =  25.18
 FLOW VELOCITY(FEET/SEC.) =  2.27   DEPTH*VELOCITY(FT*FT/SEC.) =   1.37
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  672.0 FT WITH ELEVATION-DROP =   2.0 FT, IS   17.2 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    399.80
 LONGEST FLOWPATH FROM NODE    399.50 TO NODE    399.80 =   1693.00 FEET.

 **************************************************************************
  FLOW PROCESS FROM NODE    399.80 TO NODE    399.80 IS CODE =    1
 ----------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
 ======================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   19.15
  RAINFALL INTENSITY(INCH/HR) =   1.88
  AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.25
  AREA-AVERAGED Ap =  0.31
  EFFECTIVE STREAM AREA(ACRES) =      17.20
  TOTAL STREAM AREA(ACRES) =       17.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      27.92

  ** CONFLUENCE DATA **
  STREAM      Q     Tc   Intensity  Fp(Fm)      Ap      Ae     HEADWATER
  NUMBER    (CFS) (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1      73.94  18.33   1.928   0.26( 0.11) 0.42     43.3     399.10
     2      27.92  19.15   1.881   0.25( 0.08) 0.31     17.2     399.50

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

  ** PEAK FLOW RATE TABLE **
  STREAM      Q     Tc   Intensity  Fp(Fm)      Ap      Ae     HEADWATER
  NUMBER    (CFS) (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     101.38  18.33   1.928   0.26( 0.10) 0.39     59.8     399.10
     2      99.93  19.15   1.881   0.26( 0.10) 0.38     60.5     399.50
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     101.38    Tc(MIN.) =    18.33
  EFFECTIVE AREA(ACRES) =      59.77   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.26  AREA-AVERAGED Ap =  0.39
  TOTAL AREA(ACRES) =        60.5
  LONGEST FLOWPATH FROM NODE     399.10 TO NODE     399.80 =    2191.00 FEET.

*************************************************************************
  FLOW PROCESS FROM NODE    399.80 TO NODE    400.10 IS CODE =  31
-------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   100.00  DOWNSTREAM(FEET) =    98.00
  FLOW LENGTH(FEET) =   310.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  36.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.89
  ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     101.38
  PIPE TRAVEL TIME(MIN.) =   0.52    Tc(MIN.) =   18.86
  LONGEST FLOWPATH FROM NODE     399.10 TO NODE     400.10 =    2501.00 FEET.

*************************************************************************
  FLOW PROCESS FROM NODE    400.10 TO NODE    400.10 IS CODE =   1
-------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
===============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   18.86
  RAINFALL INTENSITY(INCH/HR) =   1.90
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.26
  AREA-AVERAGED Ap =  0.39
  EFFECTIVE STREAM AREA(ACRES) =      59.77
  TOTAL STREAM AREA(ACRES) =      60.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      101.38

*************************************************************************
  FLOW PROCESS FROM NODE    399.90 TO NODE    400.00 IS CODE =  21
-------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
===============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
  ELEVATION DATA: UPSTREAM(FEET) =   104.00  DOWNSTREAM(FEET) =   102.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.586
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.978
  SUBAREA Tc 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"       C       1.30     0.25     0.500    69   10.99
  COMMERCIAL                 C       0.30     0.25     0.100    69    8.59
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.425
  SUBAREA RUNOFF(CFS) =      4.14
  TOTAL AREA(ACRES) =       1.60   PEAK FLOW RATE(CFS) =      4.14
```

```
*****************************************************************************
  FLOW PROCESS FROM NODE    400.00 TO NODE    400.10 IS CODE =  62
-----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
=============================================================================
  UPSTREAM ELEVATION(FEET) =  102.00  DOWNSTREAM ELEVATION(FEET) =   98.00
  STREET LENGTH(FEET) =   970.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.43
    ***STREET FLOW SPLITS OVER STREET-CROWN***
    FULL DEPTH(FEET) =     0.52    FLOOD WIDTH(FEET) =    20.81
    FULL HALF-STREET VELOCITY(FEET/SEC.) =    2.19
    SPLIT DEPTH(FEET) =    0.30   SPLIT FLOOD WIDTH(FEET) =    9.03
    SPLIT FLOW(CFS) =    1.35   SPLIT VELOCITY(FEET/SEC.) =    1.40
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.52
    HALFSTREET FLOOD WIDTH(FEET) =   20.81
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.19
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.13
  STREET FLOW TRAVEL TIME(MIN.) =   7.39   Tc(MIN.) =   15.98
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.086
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA        Fp          Ap    SCS
       LAND USE           GROUP   (ACRES)   (INCH/HR)  (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"       C       4.30       0.25      0.500     69
  COMMERCIAL                 C       2.70       0.25      0.100     69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.346
  SUBAREA AREA(ACRES) =    7.00       SUBAREA RUNOFF(CFS) =   12.60
  EFFECTIVE AREA(ACRES) =      8.60    AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.36
  TOTAL AREA(ACRES) =       8.6        PEAK FLOW RATE(CFS) =     15.45

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.52   HALFSTREET FLOOD WIDTH(FEET) =  20.81
  FLOW VELOCITY(FEET/SEC.) = 2.19   DEPTH*VELOCITY(FT*FT/SEC.) =   1.13
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  970.0 FT WITH ELEVATION-DROP =   4.0 FT, IS   13.5 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    400.10
  LONGEST FLOWPATH FROM NODE    399.90 TO NODE    400.10 =   1300.00 FEET.

*****************************************************************************
  FLOW PROCESS FROM NODE    400.10 TO NODE    400.10 IS CODE =   1
-----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
=============================================================================
```

```
   TOTAL NUMBER OF STREAMS =   2
   CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
   TIME OF CONCENTRATION(MIN.) =   15.98
   RAINFALL INTENSITY(INCH/HR) =    2.09
   AREA-AVERAGED Fm(INCH/HR) =  0.09
   AREA-AVERAGED Fp(INCH/HR) =  0.25
   AREA-AVERAGED Ap =  0.36
   EFFECTIVE STREAM AREA(ACRES) =        8.60
   TOTAL STREAM AREA(ACRES) =       8.60
   PEAK FLOW RATE(CFS) AT CONFLUENCE =       15.45

   ** CONFLUENCE DATA **
   STREAM      Q      Tc   Intensity  Fp(Fm)     Ap     Ae    HEADWATER
   NUMBER    (CFS)  (MIN.) (INCH/HR) (INCH/HR)        (ACRES)   NODE
      1      101.38  18.86    1.897  0.26( 0.10) 0.39    59.8    399.10
      1       99.93  19.67    1.852  0.26( 0.10) 0.38    60.5    399.50
      2       15.45  15.98    2.086  0.25( 0.09) 0.36     8.6    399.90

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

   ** PEAK FLOW RATE TABLE **
   STREAM      Q      Tc   Intensity  Fp(Fm)     Ap     Ae    HEADWATER
   NUMBER    (CFS)  (MIN.) (INCH/HR) (INCH/HR)        (ACRES)   NODE
      1      110.39  15.98    2.086  0.26( 0.10) 0.38    59.2    399.90
      2      115.37  18.86    1.897  0.26( 0.10) 0.38    68.4    399.10
      3      113.57  19.67    1.852  0.26( 0.10) 0.38    69.1    399.50

   COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
   PEAK FLOW RATE(CFS) =      115.37    Tc(MIN.) =     18.86
   EFFECTIVE AREA(ACRES) =      68.37   AREA-AVERAGED Fm(INCH/HR) =  0.10
   AREA-AVERAGED Fp(INCH/HR) =  0.26  AREA-AVERAGED Ap =  0.38
   TOTAL AREA(ACRES) =       69.1
   LONGEST FLOWPATH FROM NODE    399.10 TO NODE    400.10 =    2501.00 FEET.

 **************************************************************************
   FLOW PROCESS FROM NODE    400.10 TO NODE    400.40 IS CODE =  31
 --------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
 ==========================================================================
   ELEVATION DATA: UPSTREAM(FEET) =     98.00  DOWNSTREAM(FEET) =    97.00
   FLOW LENGTH(FEET) =   315.00   MANNING'S N =  0.013
   DEPTH OF FLOW IN  57.0 INCH PIPE IS  44.4 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) =   7.80
   ESTIMATED PIPE DIAMETER(INCH) =  57.00    NUMBER OF PIPES =   1
   PIPE-FLOW(CFS) =      115.37
   PIPE TRAVEL TIME(MIN.) =   0.67    Tc(MIN.) =   19.53
   LONGEST FLOWPATH FROM NODE    399.10 TO NODE    400.40 =    2816.00 FEET.

 **************************************************************************
   FLOW PROCESS FROM NODE    400.40 TO NODE    400.40 IS CODE =   1
 --------------------------------------------------------------------------
   >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 ==========================================================================
   TOTAL NUMBER OF STREAMS =  2
   CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
   TIME OF CONCENTRATION(MIN.) =   19.53
   RAINFALL INTENSITY(INCH/HR) =   1.86
   AREA-AVERAGED Fm(INCH/HR) =  0.10
```

  AREA-AVERAGED Fp(INCH/HR) = 0.26
  AREA-AVERAGED Ap = 0.38
  EFFECTIVE STREAM AREA(ACRES) =   68.37
  TOTAL STREAM AREA(ACRES) =   69.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   115.37

****
  FLOW PROCESS FROM NODE   400.20 TO NODE   400.30 IS CODE = 21

  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   272.00
  ELEVATION DATA: UPSTREAM(FEET) =   104.00 DOWNSTREAM(FEET) =   102.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   7.646
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.183
  SUBAREA Tc AND LOSS RATE DATA(AMC II):
   DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS   Tc
       LAND USE   GROUP   (ACRES) (INCH/HR) (DECIMAL) CN   (MIN.)
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"   C   0.60   0.25   0.500   69   9.78
  COMMERCIAL   C   0.30   0.25   0.100   69   7.65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.367
  SUBAREA RUNOFF(CFS) =   2.50
  TOTAL AREA(ACRES) =   0.90   PEAK FLOW RATE(CFS) =   2.50

****
  FLOW PROCESS FROM NODE   400.30 TO NODE   400.40 IS CODE = 62

  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 1 USED)<<<<<
==
  UPSTREAM ELEVATION(FEET) = 102.00 DOWNSTREAM ELEVATION(FEET) =   97.00
  STREET LENGTH(FEET) = 1199.00   CURB HEIGHT(INCHES) = 6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   9.45
    STREET FLOW SPLITS OVER STREET-CROWN
    FULL DEPTH(FEET) =   0.52   FLOOD WIDTH(FEET) =   20.81
    FULL HALF-STREET VELOCITY(FEET/SEC.) =   2.20
    SPLIT DEPTH(FEET) =   0.19   SPLIT FLOOD WIDTH(FEET) =   3.72
    SPLIT FLOW(CFS) =   0.32   SPLIT VELOCITY(FEET/SEC.) =   1.12
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) = 0.52
    HALFSTREET FLOOD WIDTH(FEET) =   20.81
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   2.20
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.14
  STREET FLOW TRAVEL TIME(MIN.) = 9.09   Tc(MIN.) =   16.73

   * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.032
   SUBAREA LOSS RATE DATA(AMC II):
    DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
        LAND USE   GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
   RESIDENTIAL
   "5-7 DWELLINGS/ACRE"   C   2.10   0.25   0.500   69
   COMMERCIAL   C   5.70   0.25   0.100   69
   SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
   SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.208
   SUBAREA AREA(ACRES) =   7.80   SUBAREA RUNOFF(CFS) =   13.90
   EFFECTIVE AREA(ACRES) =   8.70   AREA-AVERAGED Fm(INCH/HR) = 0.06
   AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.22
   TOTAL AREA(ACRES) =   8.7   PEAK FLOW RATE(CFS) =   15.47

   END OF SUBAREA STREET FLOW HYDRAULICS:
   DEPTH(FEET) = 0.52   HALFSTREET FLOOD WIDTH(FEET) = 20.81
   FLOW VELOCITY(FEET/SEC.) = 2.20   DEPTH*VELOCITY(FT*FT/SEC.) =   1.14
   *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
          AND L = 1199.0 FT WITH ELEVATION-DROP =   5.0 FT, IS   14.5 CFS,
          WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE   400.40
   LONGEST FLOWPATH FROM NODE   400.20 TO NODE   400.40 =   1471.00 FEET.

   ****
    FLOW PROCESS FROM NODE   400.40 TO NODE   400.40 IS CODE =   81

    >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
   ==
    MAINLINE Tc(MIN.) =   16.73
    * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.032
    SUBAREA LOSS RATE DATA(AMC II):
     DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
         LAND USE   GROUP   (ACRES) (INCH/HR) (DECIMAL) CN
    COMMERCIAL   C   1.00   0.25   0.100   69
    NATURAL FAIR COVER
    "OPEN BRUSH"   C   0.30   0.25   1.000   77
    SCHOOL   C   0.40   0.25   0.600   69
    SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
    SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.376
    SUBAREA AREA(ACRES) =   1.70   SUBAREA RUNOFF(CFS) =   2.96
    EFFECTIVE AREA(ACRES) =   10.40   AREA-AVERAGED Fm(INCH/HR) = 0.06
    AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.25
    TOTAL AREA(ACRES) =   10.4   PEAK FLOW RATE(CFS) =   18.43

   ****
    FLOW PROCESS FROM NODE   400.40 TO NODE   400.40 IS CODE =   1

    >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
    >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
   ==
    TOTAL NUMBER OF STREAMS = 2
    CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
    TIME OF CONCENTRATION(MIN.) =   16.73
    RAINFALL INTENSITY(INCH/HR) =   2.03
    AREA-AVERAGED Fm(INCH/HR) = 0.06
    AREA-AVERAGED Fp(INCH/HR) = 0.25
    AREA-AVERAGED Ap = 0.25
    EFFECTIVE STREAM AREA(ACRES) =   10.40
    TOTAL STREAM AREA(ACRES) =   10.40
    PEAK FLOW RATE(CFS) AT CONFLUENCE =   18.43

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	110.39	16.66	2.037	0.26(0.10)	0.38	59.2	399.90
1	115.37	19.53	1.860	0.26(0.10)	0.38	68.4	399.10
1	113.57	20.35	1.816	0.26(0.10)	0.38	69.1	399.50
2	18.43	16.73	2.032	0.25(0.06)	0.25	10.4	400.20

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	128.78	16.66	2.037	0.26(0.09)	0.36	69.6	399.90
2	128.96	16.73	2.032	0.26(0.09)	0.36	69.9	400.20
3	132.19	19.53	1.860	0.26(0.09)	0.36	78.8	399.10
4	129.99	20.35	1.816	0.26(0.09)	0.36	79.5	399.50

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =   132.19   Tc(MIN.) =   19.53
EFFECTIVE AREA(ACRES) =   78.77   AREA-AVERAGED Fm(INCH/HR) = 0.09
AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.36
TOTAL AREA(ACRES) =   79.5
LONGEST FLOWPATH FROM NODE   399.10 TO NODE   400.40 =   2816.00 FEET.

****
  FLOW PROCESS FROM NODE   400.40 TO NODE   401.00 IS CODE = 31

  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===
  ELEVATION DATA: UPSTREAM(FEET) =   97.00 DOWNSTREAM(FEET) =   94.00
  FLOW LENGTH(FEET) =   476.00   MANNING'S N = 0.013
  DEPTH OF FLOW IN 54.0 INCH PIPE IS 39.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 10.53
  ESTIMATED PIPE DIAMETER(INCH) = 54.00   NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =   132.19
  PIPE TRAVEL TIME(MIN.) =   0.75   Tc(MIN.) =   20.28
  LONGEST FLOWPATH FROM NODE   399.10 TO NODE   401.00 =   3292.00 FEET.

****
  FLOW PROCESS FROM NODE   401.00 TO NODE   401.00 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.) =   20.28
  RAINFALL INTENSITY(INCH/HR) =   1.82
  AREA-AVERAGED Fm(INCH/HR) = 0.09
  AREA-AVERAGED Fp(INCH/HR) = 0.26
  AREA-AVERAGED Ap = 0.36
  EFFECTIVE STREAM AREA(ACRES) =   78.77
  TOTAL STREAM AREA(ACRES) =   79.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   132.19

****
  FLOW PROCESS FROM NODE   401.10 TO NODE   401.20 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==
INITIAL SUBAREA FLOW-LENGTH(FEET) =   327.00
ELEVATION DATA: UPSTREAM(FEET) =   103.00 DOWNSTREAM(FEET) =   101.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   8.539
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.987
SUBAREA Tc AND LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS	Tc
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN	(MIN.)
COMMERCIAL	C	1.40	0.25	0.100	69	8.54

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA RUNOFF(CFS) =   3.73
TOTAL AREA(ACRES) =   1.40   PEAK FLOW RATE(CFS) =   3.73

****
FLOW PROCESS FROM NODE   401.20 TO NODE   401.00 IS CODE = 62

>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STREET TABLE SECTION # 1 USED)<<<<<
==
UPSTREAM ELEVATION(FEET) = 101.00 DOWNSTREAM ELEVATION(FEET) =   94.00
STREET LENGTH(FEET) = 1286.00   CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 20.00

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

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   14.35
  STREET FLOW SPLITS OVER STREET-CROWN
  FULL DEPTH(FEET) =   0.52   FLOOD WIDTH(FEET) =   20.81
  FULL HALF-STREET VELOCITY(FEET/SEC.) =   2.51
  SPLIT DEPTH(FEET) =   0.39   SPLIT FLOOD WIDTH(FEET) =   13.48
  SPLIT FLOW(CFS) =   3.91   SPLIT VELOCITY(FEET/SEC.) =   1.99
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) = 0.52
  HALFSTREET FLOOD WIDTH(FEET) =   20.81
  AVERAGE FLOW VELOCITY(FEET/SEC.) =   2.51
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.30
STREET FLOW TRAVEL TIME(MIN.) =   8.53   Tc(MIN.) =   17.07
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.009
SUBAREA LOSS RATE DATA(AMC II):

DEVELOPMENT TYPE/	SCS SOIL	AREA	Fp	Ap	SCS
LAND USE	GROUP	(ACRES)	(INCH/HR)	(DECIMAL)	CN
RESIDENTIAL					
"5-7 DWELLINGS/ACRE"	C	5.70	0.25	0.500	69
COMMERCIAL	C	6.30	0.25	0.100	69
NATURAL FAIR COVER					
"OPEN BRUSH"	C	0.20	0.25	1.000	77

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.302

```
SUBAREA AREA(ACRES) =   12.20      SUBAREA RUNOFF(CFS) =   21.23
EFFECTIVE AREA(ACRES) =     13.60    AREA-AVERAGED Fm(INCH/HR) =  0.07
AREA-AVERAGED Fp(INCH/HR) = 0.25  AREA-AVERAGED Ap =  0.28
TOTAL AREA(ACRES) =        13.6        PEAK FLOW RATE(CFS) =      23.73

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.53   HALFSTREET FLOOD WIDTH(FEET) =  21.64
FLOW VELOCITY(FEET/SEC.) =  2.63   DEPTH*VELOCITY(FT*FT/SEC.) =   1.40
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L = 1286.0 FT WITH ELEVATION-DROP =   7.0 FT, IS   22.8 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    401.00
LONGEST FLOWPATH FROM NODE    401.10 TO NODE    401.00 =    1613.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    401.00 TO NODE    401.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   17.07
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.009
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL    AREA      Fp         Ap      SCS
       LAND USE           GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
   RESIDENTIAL
   "5-7 DWELLINGS/ACRE"      C       2.50      0.25      0.500     69
   COMMERCIAL                C       2.90      0.25      0.100     69
   NATURAL FAIR COVER
   "OPEN BRUSH"              C       0.30      0.25      1.000     77
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.323
  SUBAREA AREA(ACRES) =    5.70      SUBAREA RUNOFF(CFS) =    9.89
  EFFECTIVE AREA(ACRES) =     19.30   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) = 0.25  AREA-AVERAGED Ap =  0.29
  TOTAL AREA(ACRES) =        19.3        PEAK FLOW RATE(CFS) =      33.62

****************************************************************************
  FLOW PROCESS FROM NODE    401.00 TO NODE    401.00 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.) =   17.07
  RAINFALL INTENSITY(INCH/HR) =   2.01
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.25
  AREA-AVERAGED Ap =  0.29
  EFFECTIVE STREAM AREA(ACRES) =      19.30
  TOTAL STREAM AREA(ACRES) =      19.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      33.62

  ** CONFLUENCE DATA **
```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	128.78	17.41	1.986	0.26(0.09)	0.36	69.6	399.90
1	128.96	17.49	1.981	0.26(0.09)	0.36	69.9	400.20
1	132.19	20.28	1.820	0.26(0.09)	0.36	78.8	399.10
1	129.99	21.10	1.779	0.26(0.09)	0.36	79.5	399.50
2	33.62	17.07	2.009	0.25(0.07)	0.29	19.3	401.10

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

** PEAK FLOW RATE TABLE **

STREAM	Q	Tc	Intensity	Fp(Fm)	Ap	Ae	HEADWATER
NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	161.39	17.07	2.009	0.26(0.09)	0.35	87.5	401.10
2	162.01	17.41	1.986	0.26(0.09)	0.35	88.9	399.90
3	162.09	17.49	1.981	0.26(0.09)	0.35	89.2	400.20
4	162.52	20.28	1.820	0.26(0.09)	0.35	98.1	399.10
5	159.61	21.10	1.779	0.26(0.09)	0.35	98.8	399.50

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =   162.52   Tc(MIN.) =   20.28
EFFECTIVE AREA(ACRES) =   98.07   AREA-AVERAGED Fm(INCH/HR) = 0.09
AREA-AVERAGED Fp(INCH/HR) = 0.26 AREA-AVERAGED Ap = 0.35
TOTAL AREA(ACRES) =   98.8
LONGEST FLOWPATH FROM NODE   399.10 TO NODE   401.00 =   3292.00 FEET.

****
  FLOW PROCESS FROM NODE   401.00 TO NODE   403.00 IS CODE = 31

  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===
  ELEVATION DATA: UPSTREAM(FEET) =   94.00 DOWNSTREAM(FEET) =   88.00
  FLOW LENGTH(FEET) = 1124.00   MANNING'S N = 0.013
  DEPTH OF FLOW IN 60.0 INCH PIPE IS 44.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 10.40
  ESTIMATED PIPE DIAMETER(INCH) = 60.00   NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =   162.52
  PIPE TRAVEL TIME(MIN.) =   1.80   Tc(MIN.) =   22.08
  LONGEST FLOWPATH FROM NODE   399.10 TO NODE   403.00 =   4416.00 FEET.

****
  FLOW PROCESS FROM NODE   403.00 TO NODE   403.00 IS CODE =   1

  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
===
  TOTAL NUMBER OF STREAMS = 2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
  TIME OF CONCENTRATION(MIN.) =   22.08
  RAINFALL INTENSITY(INCH/HR) =   1.73
  AREA-AVERAGED Fm(INCH/HR) = 0.09
  AREA-AVERAGED Fp(INCH/HR) = 0.26
  AREA-AVERAGED Ap = 0.35
  EFFECTIVE STREAM AREA(ACRES) =   98.07
  TOTAL STREAM AREA(ACRES) =   98.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =   162.52

****
  FLOW PROCESS FROM NODE   402.10 TO NODE   402.20 IS CODE = 21

  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
===
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   256.00
  ELEVATION DATA: UPSTREAM(FEET) =   100.00 DOWNSTREAM(FEET) =   99.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   8.469
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 3.002
SUBAREA Tc 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"      C       1.40     0.25      0.500     69   10.84
 COMMERCIAL               C       1.00     0.25      0.100     69    8.47
```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.333
SUBAREA RUNOFF(CFS) =   6.30
TOTAL AREA(ACRES) =   2.40   PEAK FLOW RATE(CFS) =   6.30

****
  FLOW PROCESS FROM NODE   402.20 TO NODE   402.30 IS CODE = 62

  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 1 USED)<<<<<
==
  UPSTREAM ELEVATION(FEET) = 99.00 DOWNSTREAM ELEVATION(FEET) =   95.00
  STREET LENGTH(FEET) =   817.00   CURB HEIGHT(INCHES) = 6.0
  STREET HALFWIDTH(FEET) = 20.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   13.46
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) = 0.46
    HALFSTREET FLOOD WIDTH(FEET) =   17.15
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   2.18
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.00
  STREET FLOW TRAVEL TIME(MIN.) =   6.25   Tc(MIN.) =   14.72
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.187
  SUBAREA LOSS RATE DATA(AMC II):
```
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE           GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"      C       4.50     0.25      0.500     69
 COMMERCIAL               C       2.90     0.25      0.100     69
 NATURAL FAIR COVER
 "OPEN BRUSH"             C       0.10     0.25      1.000     77
```
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.352
SUBAREA AREA(ACRES) =   7.50   SUBAREA RUNOFF(CFS) =   14.17
EFFECTIVE AREA(ACRES) =   9.90   AREA-AVERAGED Fm(INCH/HR) = 0.09
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.35
TOTAL AREA(ACRES) =   9.9   PEAK FLOW RATE(CFS) =   18.71

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.51   HALFSTREET FLOOD WIDTH(FEET) = 19.95
  FLOW VELOCITY(FEET/SEC.) = 2.35   DEPTH*VELOCITY(FT*FT/SEC.) =   1.19
  LONGEST FLOWPATH FROM NODE   402.10 TO NODE   402.30 =   1073.00 FEET.

```
*************************************************************************
  FLOW PROCESS FROM NODE    402.30 TO NODE    402.00 IS CODE =  62
-------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  3 USED)<<<<<
=========================================================================
  UPSTREAM ELEVATION(FEET) =  95.00  DOWNSTREAM ELEVATION(FEET) =   92.00
  STREET LENGTH(FEET) =   434.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 51.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  25.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     24.48
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.56
    HALFSTREET FLOOD WIDTH(FEET) =   20.23
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.86
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.61
  STREET FLOW TRAVEL TIME(MIN.) =   2.53   Tc(MIN.) =   17.25
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.997
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE           GROUP   (ACRES)  (INCH/HR) (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"      C       2.10      0.25      0.500     69
  APARTMENTS               C       0.30      0.25      0.200     69
  COMMERCIAL               C       3.50      0.25      0.100     69
  NATURAL FAIR COVER
  "OPEN BRUSH"             C       0.80      0.25      1.000     77
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.337
  SUBAREA AREA(ACRES) =    6.70       SUBAREA RUNOFF(CFS) =   11.53
  EFFECTIVE AREA(ACRES) =    16.60    AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.34
  TOTAL AREA(ACRES) =      16.6        PEAK FLOW RATE(CFS) =     28.55

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.59   HALFSTREET FLOOD WIDTH(FEET) =  21.45
  FLOW VELOCITY(FEET/SEC.) = 2.98   DEPTH*VELOCITY(FT*FT/SEC.) =   1.75
  LONGEST FLOWPATH FROM NODE    402.10 TO NODE    402.00 =    1507.00 FEET.

*************************************************************************
  FLOW PROCESS FROM NODE    402.00 TO NODE    403.00 IS CODE =  62
-------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  3 USED)<<<<<
=========================================================================
  UPSTREAM ELEVATION(FEET) =   92.00  DOWNSTREAM ELEVATION(FEET) =   88.00
  STREET LENGTH(FEET) =   727.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 51.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  25.00
```

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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) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0150

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      49.58
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.71
   HALFSTREET FLOOD WIDTH(FEET) =   30.19
   AVERAGE FLOW VELOCITY(FEET/SEC.) =     3.11
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.22
 STREET FLOW TRAVEL TIME(MIN.) =   3.90   Tc(MIN.) =   21.15
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.777
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL    AREA      Fp         Ap     SCS
      LAND USE            GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"        C       10.50      0.25      0.500     69
 COMMERCIAL                  C       15.70      0.25      0.100     69
 NATURAL FAIR COVER
 "OPEN BRUSH"                C        1.20      0.25      1.000     77
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.293
 SUBAREA AREA(ACRES) =   27.40      SUBAREA RUNOFF(CFS) =   42.01
 EFFECTIVE AREA(ACRES) =    44.00    AREA-AVERAGED Fm(INCH/HR) =  0.08
 AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.31
 TOTAL AREA(ACRES) =       44.0       PEAK FLOW RATE(CFS) =      67.27


 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.78   HALFSTREET FLOOD WIDTH(FEET) =  36.83
 FLOW VELOCITY(FEET/SEC.) =  3.30   DEPTH*VELOCITY(FT*FT/SEC.) =   2.57
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  727.0 FT WITH ELEVATION-DROP =   4.0 FT, IS   58.8 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    403.00
 LONGEST FLOWPATH FROM NODE    402.10 TO NODE    403.00 =   2234.00 FEET.

**************************************************************************
 FLOW PROCESS FROM NODE    403.00 TO NODE    403.00 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.) =   21.15
 RAINFALL INTENSITY(INCH/HR) =   1.78
 AREA-AVERAGED Fm(INCH/HR) =  0.08
 AREA-AVERAGED Fp(INCH/HR) =  0.25
 AREA-AVERAGED Ap =  0.31
 EFFECTIVE STREAM AREA(ACRES) =      44.00
 TOTAL STREAM AREA(ACRES) =      44.00
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      67.27

 ** CONFLUENCE DATA **
  STREAM      Q     Tc    Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER    (CFS)  (MIN.) (INCH/HR)  (INCH/HR)        (ACRES)     NODE
    1      161.39  18.87    1.896   0.26( 0.09) 0.35      87.5     401.10
```

```
  1      162.01   19.21    1.877  0.26( 0.09) 0.35      88.9       399.90
  1      162.09   19.29    1.873  0.26( 0.09) 0.35      89.2       400.20
  1      162.52   22.08    1.733  0.26( 0.09) 0.35      98.1       399.10
  1      159.61   22.91    1.697  0.26( 0.09) 0.35      98.8       399.50
  2       67.27   21.15    1.777  0.25( 0.08) 0.31      44.0       402.10
```

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

  ** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	225.65	18.87	1.896	0.25(0.09)	0.34	126.8	401.10
2	226.73	19.21	1.877	0.25(0.09)	0.34	128.9	399.90
3	226.92	19.29	1.873	0.25(0.09)	0.34	129.3	400.20
4	229.64	21.15	1.777	0.25(0.09)	0.34	139.1	402.10
5	228.07	22.08	1.733	0.25(0.09)	0.34	142.1	399.10
6	223.73	22.91	1.697	0.25(0.09)	0.34	142.8	399.50

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =   229.64   Tc(MIN.) =   21.15
  EFFECTIVE AREA(ACRES) =   139.10   AREA-AVERAGED Fm(INCH/HR) = 0.09
  AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.34
  TOTAL AREA(ACRES) =   142.8
  LONGEST FLOWPATH FROM NODE   399.10 TO NODE   403.00 =   4416.00 FEET.

```
****************************************************************************
  FLOW PROCESS FROM NODE    403.00 TO NODE    408.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     88.00  DOWNSTREAM(FEET) =     76.00
  FLOW LENGTH(FEET) = 3339.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  72.0 INCH PIPE IS  56.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.70
  ESTIMATED PIPE DIAMETER(INCH) =  72.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      229.64
  PIPE TRAVEL TIME(MIN.) =   5.74    Tc(MIN.) =   26.89
  LONGEST FLOWPATH FROM NODE    399.10 TO NODE    408.00 =    7755.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    408.00 TO NODE    408.00 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.) =   26.89
  RAINFALL INTENSITY(INCH/HR) =   1.55
  AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.25
  AREA-AVERAGED Ap =  0.34
  EFFECTIVE STREAM AREA(ACRES) =      139.10
  TOTAL STREAM AREA(ACRES) =      142.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      229.64

****************************************************************************
  FLOW PROCESS FROM NODE    404.00 TO NODE    405.00 IS CODE =  21
----------------------------------------------------------------------------
```

```
>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
ELEVATION DATA: UPSTREAM(FEET) =     88.00  DOWNSTREAM(FEET) =     87.00

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.862
*  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.751
SUBAREA Tc 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"      C        6.70     0.25      0.500     69   12.62
 COMMERCIAL                C        2.50     0.25      0.100     69    9.86
 URBAN POOR COVER
 "TURF"                    C        0.80     0.25      1.000     83   17.03
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.440
 SUBAREA RUNOFF(CFS) =     23.77
 TOTAL AREA(ACRES) =     10.00   PEAK FLOW RATE(CFS) =     23.77

****************************************************************************
 FLOW PROCESS FROM NODE    405.00 TO NODE    406.00 IS CODE =  62
--------------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
================================================================================
 UPSTREAM ELEVATION(FEET) =   87.00  DOWNSTREAM ELEVATION(FEET) =    86.50
 STREET LENGTH(FEET) =   352.00   CURB HEIGHT(INCHES) =  8.0
 STREET HALFWIDTH(FEET) = 42.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  21.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      34.50
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.78
   HALFSTREET FLOOD WIDTH(FEET) =   37.17
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.67
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.31
 STREET FLOW TRAVEL TIME(MIN.) =   3.51   Tc(MIN.) =   13.37
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.310
 SUBAREA LOSS RATE DATA(AMC  II):
 DEVELOPMENT TYPE/      SCS SOIL    AREA      Fp         Ap      SCS
     LAND USE           GROUP    (ACRES)  (INCH/HR)  (DECIMAL)  CN
 RESIDENTIAL
 "5-7 DWELLINGS/ACRE"      C        6.80     0.25      0.500     69
 COMMERCIAL                C        3.20     0.25      0.100     69
 URBAN POOR COVER
 "TURF"                    C        0.80     0.25      1.000     83
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.419
 SUBAREA AREA(ACRES) =   10.80      SUBAREA RUNOFF(CFS) =   21.44
```

```
EFFECTIVE AREA(ACRES) =     20.80    AREA-AVERAGED Fm(INCH/HR) =  0.11
AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.43
TOTAL AREA(ACRES) =        20.8       PEAK FLOW RATE(CFS) =      41.24

END OF SUBAREA STREET FLOW HYDRAULICS:
DEPTH(FEET) = 0.83   HALFSTREET FLOOD WIDTH(FEET) =  41.27
FLOW VELOCITY(FEET/SEC.) =  1.73   DEPTH*VELOCITY(FT*FT/SEC.) =   1.43
*NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
       AND L =  352.0 FT WITH ELEVATION-DROP =   0.5 FT, IS   23.1 CFS,
       WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    406.00
LONGEST FLOWPATH FROM NODE    404.00 TO NODE    406.00 =    682.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    406.00 TO NODE    407.00 IS CODE =  62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =   86.50  DOWNSTREAM ELEVATION(FEET) =    84.00
  STREET LENGTH(FEET) =  1031.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 42.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  21.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      46.31
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.79
    HALFSTREET FLOOD WIDTH(FEET) =   37.66
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.20
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.74
  STREET FLOW TRAVEL TIME(MIN.) =   7.80   Tc(MIN.) =   21.18
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.775
  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"       C       1.60     0.25      0.500     69
  COMMERCIAL                 C       3.10     0.25      0.100     69
  URBAN POOR COVER
  "TURF"                     C       2.10     0.25      1.000     83
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.472
  SUBAREA AREA(ACRES) =   6.80      SUBAREA RUNOFF(CFS) =   10.14
  EFFECTIVE AREA(ACRES) =     27.60    AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.44
  TOTAL AREA(ACRES) =        27.6       PEAK FLOW RATE(CFS) =      41.37

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.76   HALFSTREET FLOOD WIDTH(FEET) =  35.20
  FLOW VELOCITY(FEET/SEC.) =  2.15   DEPTH*VELOCITY(FT*FT/SEC.) =   1.64
  LONGEST FLOWPATH FROM NODE    404.00 TO NODE    407.00 =    1713.00 FEET.

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

```
  FLOW PROCESS FROM NODE    407.00 TO NODE    408.00 IS CODE =  62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =   84.00  DOWNSTREAM ELEVATION(FEET) =   76.00
  STREET LENGTH(FEET) = 1632.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 42.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  21.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      63.19
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.78
    HALFSTREET FLOOD WIDTH(FEET) =   36.84
    AVERAGE FLOW VELOCITY(FEET/SEC.) =     3.10
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.42
  STREET FLOW TRAVEL TIME(MIN.) =   8.79   Tc(MIN.) =   29.96
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.455
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL    AREA      Fp         Ap     SCS
       LAND USE          GROUP   (ACRES)  (INCH/HR) (DECIMAL)  CN
  RESIDENTIAL
  "5-7 DWELLINGS/ACRE"      C      22.30     0.25      0.500     69
  COMMERCIAL                C      12.40     0.25      0.100     69
  URBAN POOR COVER
  "TURF"                    C       0.80     0.25      1.000     83
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.372
  SUBAREA AREA(ACRES) =   35.50       SUBAREA RUNOFF(CFS) =   43.52
  EFFECTIVE AREA(ACRES) =      63.10    AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.40
  TOTAL AREA(ACRES) =       63.1         PEAK FLOW RATE(CFS) =      76.94

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.83   HALFSTREET FLOOD WIDTH(FEET) =  41.44
  FLOW VELOCITY(FEET/SEC.) = 3.20   DEPTH*VELOCITY(FT*FT/SEC.) =   2.65
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L = 1632.0 FT WITH ELEVATION-DROP =   8.0 FT, IS   61.4 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    408.00
  LONGEST FLOWPATH FROM NODE    404.00 TO NODE    408.00 =    3345.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    408.00 TO NODE    408.00 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.) =   29.96
  RAINFALL INTENSITY(INCH/HR) =  1.46
  AREA-AVERAGED Fm(INCH/HR) =  0.10
```

```
  AREA-AVERAGED Fp(INCH/HR) =  0.25
  AREA-AVERAGED Ap =  0.40
  EFFECTIVE STREAM AREA(ACRES) =      63.10
  TOTAL STREAM AREA(ACRES) =      63.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      76.94

  ** CONFLUENCE DATA **
  STREAM     Q      Tc   Intensity  Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER   (CFS)  (MIN.) (INCH/HR) (INCH/HR)        (ACRES)    NODE
     1     225.65  24.62   1.628   0.25( 0.09) 0.34    126.8    401.10
     1     226.73  24.96   1.616   0.25( 0.09) 0.34    128.9    399.90
     1     226.92  25.04   1.613   0.25( 0.09) 0.34    129.3    400.20
     1     229.64  26.89   1.548   0.25( 0.09) 0.34    139.1    402.10
     1     228.07  27.83   1.518   0.25( 0.09) 0.34    142.1    399.10
     1     223.73  28.66   1.493   0.25( 0.09) 0.34    142.8    399.50
     2      76.94  29.96   1.455   0.25( 0.10) 0.40     63.1    404.00

  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     296.95  24.62   1.628   0.25( 0.09) 0.36    178.6    401.10
     2     298.42  24.96   1.616   0.25( 0.09) 0.36    181.4    399.90
     3     298.69  25.04   1.613   0.25( 0.09) 0.36    182.1    400.20
     4     303.43  26.89   1.548   0.25( 0.09) 0.36    195.7    402.10
     5     302.84  27.83   1.518   0.25( 0.09) 0.36    200.7    399.10
     6     299.36  28.66   1.493   0.25( 0.09) 0.36    203.2    399.50
     7     294.69  29.96   1.455   0.25( 0.09) 0.36    205.9    404.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      303.43    Tc(MIN.) =    26.89
  EFFECTIVE AREA(ACRES) =     195.72   AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.36
  TOTAL AREA(ACRES) =      205.9
  LONGEST FLOWPATH FROM NODE    399.10 TO NODE    408.00 =    7755.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    408.00 TO NODE    415.00 IS CODE =  31
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =     76.00  DOWNSTREAM(FEET) =     54.00
  FLOW LENGTH(FEET) = 4095.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  75.0 INCH PIPE IS  56.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) = 12.15
  ESTIMATED PIPE DIAMETER(INCH) = 75.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      303.43
  PIPE TRAVEL TIME(MIN.) =   5.62    Tc(MIN.) =   32.51
  LONGEST FLOWPATH FROM NODE    399.10 TO NODE    415.00 =   11850.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    415.00 TO NODE    415.00 IS CODE =   1
--------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
```

```
 TIME OF CONCENTRATION(MIN.) =   32.51
 RAINFALL INTENSITY(INCH/HR) =   1.39
 AREA-AVERAGED Fm(INCH/HR) =  0.09
 AREA-AVERAGED Fp(INCH/HR) =  0.25
 AREA-AVERAGED Ap =  0.36
 EFFECTIVE STREAM AREA(ACRES) =     195.72
 TOTAL STREAM AREA(ACRES) =     205.90
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     303.43
```

```
**************************************************************************
 FLOW PROCESS FROM NODE    409.00 TO NODE    410.00 IS CODE =  21
--------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   330.00
 ELEVATION DATA: UPSTREAM(FEET) =     76.00  DOWNSTREAM(FEET) =     74.00
```

```
 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.586
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.978
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
```

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
COMMERCIAL URBAN POOR COVER	C	0.60	0.25	0.100	69	8.59
"TURF"	C	0.20	0.25	1.000	83	14.83

```
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.325
 SUBAREA RUNOFF(CFS) =      2.09
 TOTAL AREA(ACRES) =      0.80   PEAK FLOW RATE(CFS) =      2.09
```

```
**************************************************************************
 FLOW PROCESS FROM NODE    410.00 TO NODE    411.00 IS CODE =  62
--------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
==========================================================================
 UPSTREAM ELEVATION(FEET) =   74.00  DOWNSTREAM ELEVATION(FEET) =   71.00
 STREET LENGTH(FEET) =   452.00   CURB HEIGHT(INCHES) =  8.0
 STREET HALFWIDTH(FEET) = 42.00
```

```
 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  21.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.020
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020
```

```
 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
 STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200
```

```
   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.11
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.33
   HALFSTREET FLOOD WIDTH(FEET) =    8.35
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.75
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.57
 STREET FLOW TRAVEL TIME(MIN.) =    4.29   Tc(MIN.) =   12.88
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.361
 SUBAREA LOSS RATE DATA(AMC  II):
```

```
                                  GC10EX
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp        Ap     SCS
      LAND USE          GROUP    (ACRES) (INCH/HR) (DECIMAL)  CN
 COMMERCIAL                C       0.70     0.25     0.100    69
 URBAN POOR COVER
 "TURF"                    C       0.30     0.25     1.000    83
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.370
 SUBAREA AREA(ACRES) =    1.00      SUBAREA RUNOFF(CFS) =    2.04
 EFFECTIVE AREA(ACRES) =     1.80    AREA-AVERAGED Fm(INCH/HR) =  0.09
 AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.35
 TOTAL AREA(ACRES) =        1.8       PEAK FLOW RATE(CFS) =       3.68

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.34   HALFSTREET FLOOD WIDTH(FEET) =   9.09
 FLOW VELOCITY(FEET/SEC.) =  1.81   DEPTH*VELOCITY(FT*FT/SEC.) =   0.62
 LONGEST FLOWPATH FROM NODE    409.00 TO NODE    411.00 =    782.00 FEET.

 *************************************************************************
  FLOW PROCESS FROM NODE    411.00 TO NODE    412.00 IS CODE =  62
 -----------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  2 USED)<<<<<
 =======================================================================
  UPSTREAM ELEVATION(FEET) =   71.00  DOWNSTREAM ELEVATION(FEET) =   61.00
  STREET LENGTH(FEET) = 1897.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 42.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  21.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.020
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  2
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.95
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.40
    HALFSTREET FLOOD WIDTH(FEET) =   11.91
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.85
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.73
 STREET FLOW TRAVEL TIME(MIN.) = 17.09  Tc(MIN.) =   29.97
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.455
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp        Ap     SCS
      LAND USE          GROUP    (ACRES) (INCH/HR) (DECIMAL)  CN
 COMMERCIAL                C       2.20     0.25     0.100    69
 URBAN POOR COVER
 "TURF"                    C       1.50     0.25     1.000    83
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.465
 SUBAREA AREA(ACRES) =    3.70      SUBAREA RUNOFF(CFS) =    4.46
 EFFECTIVE AREA(ACRES) =     5.50    AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.43
 TOTAL AREA(ACRES) =        5.5       PEAK FLOW RATE(CFS) =       6.67

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.41   HALFSTREET FLOOD WIDTH(FEET) =  12.50
 FLOW VELOCITY(FEET/SEC.) =  1.90   DEPTH*VELOCITY(FT*FT/SEC.) =   0.78
```

LONGEST FLOWPATH FROM NODE   409.00 TO NODE   412.00 =   2679.00 FEET.

****
  FLOW PROCESS FROM NODE   412.00 TO NODE   413.00 IS CODE = 62

  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 2 USED)<<<<<
===
  UPSTREAM ELEVATION(FEET) =   61.00 DOWNSTREAM ELEVATION(FEET) =   60.00
  STREET LENGTH(FEET) =   413.00   CURB HEIGHT(INCHES) = 8.0
  STREET HALFWIDTH(FEET) = 42.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
  STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   10.09
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) = 0.51
    HALFSTREET FLOOD WIDTH(FEET) =   17.47
    AVERAGE FLOW VELOCITY(FEET/SEC.) =   1.56
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   0.79
  STREET FLOW TRAVEL TIME(MIN.) =   4.43   Tc(MIN.) =   34.39
  * 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.345
  SUBAREA LOSS RATE DATA(AMC II):
   DEVELOPMENT TYPE/   SCS SOIL   AREA   Fp   Ap   SCS
       LAND USE   GROUP   (ACRES)   (INCH/HR) (DECIMAL) CN
  COMMERCIAL   C   3.30   0.25   0.100   69
  SCHOOL   C   2.70   0.25   0.600   69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.325
  SUBAREA AREA(ACRES) =   6.00   SUBAREA RUNOFF(CFS) =   6.82
  EFFECTIVE AREA(ACRES) =   11.50   AREA-AVERAGED Fm(INCH/HR) = 0.09
  AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.37
  TOTAL AREA(ACRES) =   11.5   PEAK FLOW RATE(CFS) =   12.95

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.54   HALFSTREET FLOOD WIDTH(FEET) = 19.33
  FLOW VELOCITY(FEET/SEC.) = 1.65   DEPTH*VELOCITY(FT*FT/SEC.) =   0.90
  LONGEST FLOWPATH FROM NODE   409.00 TO NODE   413.00 =   3092.00 FEET.

****
  FLOW PROCESS FROM NODE   413.00 TO NODE   414.00 IS CODE = 62

  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION # 2 USED)<<<<<
===
  UPSTREAM ELEVATION(FEET) =   60.00 DOWNSTREAM ELEVATION(FEET) =   57.00
  STREET LENGTH(FEET) =   463.00   CURB HEIGHT(INCHES) = 8.0
  STREET HALFWIDTH(FEET) = 42.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
  INSIDE STREET CROSSFALL(DECIMAL) = 0.020
  OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   22.20
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) = 0.55
  HALFSTREET FLOOD WIDTH(FEET) =   19.70
  AVERAGE FLOW VELOCITY(FEET/SEC.) =   2.73
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   1.51
STREET FLOW TRAVEL TIME(MIN.) =   2.83   Tc(MIN.) =   37.22
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.285
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"   C   0.60   0.25   0.500   69
 COMMERCIAL   C   9.90   0.25   0.100   69
 SCHOOL   C   6.50   0.25   0.600   69
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.305
 SUBAREA AREA(ACRES) =   17.00   SUBAREA RUNOFF(CFS) =   18.49
 EFFECTIVE AREA(ACRES) =   28.50   AREA-AVERAGED Fm(INCH/HR) = 0.08
 AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.33
 TOTAL AREA(ACRES) =   28.5   PEAK FLOW RATE(CFS) =   30.83

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.61   HALFSTREET FLOOD WIDTH(FEET) = 22.44
 FLOW VELOCITY(FEET/SEC.) = 2.95   DEPTH*VELOCITY(FT*FT/SEC.) =   1.79
 LONGEST FLOWPATH FROM NODE   409.00 TO NODE   414.00 =   3555.00 FEET.

****
 FLOW PROCESS FROM NODE   414.00 TO NODE   415.00 IS CODE = 62

 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION # 2 USED)<<<<<
==
 UPSTREAM ELEVATION(FEET) =   57.00 DOWNSTREAM ELEVATION(FEET) =   54.00
 STREET LENGTH(FEET) =   819.00   CURB HEIGHT(INCHES) = 8.0
 STREET HALFWIDTH(FEET) = 42.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 21.00
 INSIDE STREET CROSSFALL(DECIMAL) = 0.020
 OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

 SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 2
 STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
 Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

  **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =   51.38
  STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
  STREET FLOW DEPTH(FEET) = 0.77
  HALFSTREET FLOOD WIDTH(FEET) =   35.36
  AVERAGE FLOW VELOCITY(FEET/SEC.) =   2.66
  PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =   2.03
STREET FLOW TRAVEL TIME(MIN.) =   5.14   Tc(MIN.) =   42.36
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 1.193
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"      C       21.30     0.25     0.500    69
 COMMERCIAL                C       10.80     0.25     0.100    69
 URBAN POOR COVER
 "TURF"                    C        0.40     0.25     1.000    83
 SCHOOL                    C        9.50     0.25     0.600    69
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.25
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.425
 SUBAREA AREA(ACRES) =   42.00      SUBAREA RUNOFF(CFS) =   41.09
 EFFECTIVE AREA(ACRES) =     70.50   AREA-AVERAGED Fm(INCH/HR) =  0.10
 AREA-AVERAGED Fp(INCH/HR) =  0.25  AREA-AVERAGED Ap =  0.39
 TOTAL AREA(ACRES) =        70.5      PEAK FLOW RATE(CFS) =     69.56

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.84   HALFSTREET FLOOD WIDTH(FEET) =  42.58
 FLOW VELOCITY(FEET/SEC.) =  2.79   DEPTH*VELOCITY(FT*FT/SEC.) =   2.33
 *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
        AND L =  819.0 FT WITH ELEVATION-DROP =   3.0 FT, IS   82.3 CFS,
        WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    415.00
 LONGEST FLOWPATH FROM NODE    409.00 TO NODE    415.00 =    4374.00 FEET.

 **************************************************************************
  FLOW PROCESS FROM NODE    415.00 TO NODE    415.00 IS CODE =   1
 --------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
 ==========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   42.36
  RAINFALL INTENSITY(INCH/HR) =   1.19
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.25
  AREA-AVERAGED Ap =  0.39
  EFFECTIVE STREAM AREA(ACRES) =      70.50
  TOTAL STREAM AREA(ACRES) =      70.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      69.56

  ** CONFLUENCE DATA **
  STREAM     Q      Tc    Intensity  Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER   (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1     296.95  30.25   1.447   0.25( 0.09) 0.36    178.6    401.10
     1     298.42  30.59   1.438   0.25( 0.09) 0.36    181.4    399.90
     1     298.69  30.66   1.436   0.25( 0.09) 0.36    182.1    400.20
     1     303.43  32.51   1.389   0.25( 0.09) 0.36    195.7    402.10
     1     302.84  33.45   1.366   0.25( 0.09) 0.36    200.7    399.10
     1     299.36  34.29   1.347   0.25( 0.09) 0.36    203.2    399.50
     1     294.69  35.60   1.318   0.25( 0.09) 0.36    205.9    404.00
     2      69.56  42.36   1.193   0.25( 0.10) 0.39     70.5    409.00

  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     358.14  30.25   1.447   0.25( 0.09) 0.36    229.0    401.10
     2     359.86  30.59   1.438   0.25( 0.09) 0.36    232.3    399.90
```

3	360.19	30.66	1.436	0.25(0.09) 0.36	233.1	400.20
4	366.33	32.51	1.389	0.25(0.09) 0.36	249.8	402.10
5	366.43	33.45	1.366	0.25(0.09) 0.36	256.3	399.10
6	363.56	34.29	1.347	0.25(0.09) 0.36	260.2	399.50
7	359.82	35.60	1.318	0.25(0.09) 0.36	265.1	404.00
8	334.25	42.36	1.193	0.25(0.09) 0.37	276.4	409.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =   366.43   Tc(MIN.) =   33.45
EFFECTIVE AREA(ACRES) =   256.33   AREA-AVERAGED Fm(INCH/HR) = 0.09
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.36
TOTAL AREA(ACRES) =   276.4
LONGEST FLOWPATH FROM NODE   399.10 TO NODE   415.00 =   11850.00 FEET.
==
END OF STUDY SUMMARY:
TOTAL AREA(ACRES)   =   276.4 TC(MIN.) =   33.45
EFFECTIVE AREA(ACRES) =   256.33 AREA-AVERAGED Fm(INCH/HR)= 0.09
AREA-AVERAGED Fp(INCH/HR) = 0.25 AREA-AVERAGED Ap = 0.364
PEAK FLOW RATE(CFS)   =   366.43

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	358.14	30.25	1.447	0.25(0.09)	0.36	229.0	401.10
2	359.86	30.59	1.438	0.25(0.09)	0.36	232.3	399.90
3	360.19	30.66	1.436	0.25(0.09)	0.36	233.1	400.20
4	366.33	32.51	1.389	0.25(0.09)	0.36	249.8	402.10
5	366.43	33.45	1.366	0.25(0.09)	0.36	256.3	399.10
6	363.56	34.29	1.347	0.25(0.09)	0.36	260.2	399.50
7	359.82	35.60	1.318	0.25(0.09)	0.36	265.1	404.00
8	334.25	42.36	1.193	0.25(0.09)	0.37	276.4	409.00

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END OF RATIONAL METHOD ANALYSIS

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