FUSCOE ENGINEERING

PRELIMINARY HYDROLOGY AND HYDRAULIC REPORT

FREEMAN SITE

Anaheim, California

Prepared For
The Shopoff Realty Investments. L.P.

Prepared By:

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Project Manager:
Trevor Dodson, P.E.

Date Prepared:
January 30, 2017
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Job Number: 1293.008.02

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1.0 INTRODUCTION

1.1 GEOGRAPHIC SETTING

The proposed 20.5 +/- acre project site is located on the northerly of South Street and westerly of East Street in the City of Anaheim, CA. The project is bounded by commercial development on the northeast, rail right of way on the southwest, South Street on the southeast and Santa Ana Street on the northwest. The site is currently commercial warehouse spaces and associated parking.

1.2 PROJECT DESCRIPTION

The proposed project consists of residential condominiums units and an apartment development. Private drives and auto courts will serve the condominiums and a parking structure will serve the apartment project. The project main entries are from South Street and Santa Ana Street. Condominium buildings are multi-story, townhome style with multiple units per building. Common use recreation areas are provided for use by the residents and their guests.

1.3 PURPOSE OF THIS REPORT

The purpose of this report is to accomplish the following objectives:

To determine storm water discharges generated within the project area for determination of design feasibility and constructability. (See Appendix 2&3).

To demonstrate that the "storm water" and "flood" protection goals as outlined in Addendum No. 1 to the O.C. Design Manual can be met.

To determine if detention is required for the project.

1.4 REFERENCES

- Orange County Hydrology Manual, 1986
- Orange County Local Drainage Manual, 1986

Project Site Location Map

2.0 EXISTING TOPOGRAPHIC & HYDROLOGIC CONDITIONS

2.1 EXISTING TOPOGRAPHY

The site is generally flat and gently slopes toward South Street from Santa Ana Street.

2.2 EXISTING ON-SITE DRAINAGE PATTERN AND FACILITIES

On site drainage follows the topography of the land, flowing from Santa Ana Street to South Street. A public storm drain system runs through the project starting at a catch basin in Santa Ana Street. In addition, a storm drain line picks up drainage from the adjacent storage yard to the northeast.

3.0 PROPOSED STORM DRAIN FACILITIES

The proposed development will maintain the historic drainage pattern and drain from Santa Ana Street to South Street. All site flows will be collected and directed to the proposed public storm drain system through the site. Catch basins are located at local low points within the site to capture subarea flows. Flow control junction structures will be installed on the storm drain system to meter the water quality flows to Modular Wetland Systems where the low flow will be treated prior to being released from the site. Water Quality is discussed in the project WQMP.

3.1 DETENTION

The proposed residential project consists of increased pervious areas as compared to the existing commercial development resulting is less runoff. The post development

project discharge is less than the existing site discharge for all storm events as shown in Section 8 of this report. Therefore, detention of proposed flows is not required.

3.2 WATER QUALITY

The proposed project water quality treatment facilities will consist of bio-filtration units located near each catch basin. These units will capture and treat the low flows as required by the SWQCB and the County of Orange. As storm flows increase, high flows will bypass these units and flow directly to the storm drain system. The water quality features are detailed in the project WQMP.

4.0 HYDROLOGY STUDY

4.1 STORM FREQUENCY

This study is intended to determine discharges for use in the design of storm drain lines. The 25 year event was chosen as the design criteria as required by the Orange County Hydrology Manual. Overflow paths are also provided due to the need to ensure the site is protected during the 100 year event. The project overflow point is located on South Street at the rail crossing as shown on the proposed hydrology map.

4.2 Hydrologic Soil Group

The project is located within Hydrologic Soil Group B. Soil Group B consists of soils having moderate infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well to well drained sandy loam soils with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.

4.3 METHODOLOGY

This study was prepared in conformance with the Orange County Hydrology Manual.

A.E.S. Computer Software was utilized to compile the hydrologic data and to determine the peak discharges.

Copies of the computer print-outs for hydrologic results are included within this report for the 25 year return frequency storm. (Appendix 2-3)

In addition, the pre and post development discharges were determined for the 2, 10 and 100 year events. The results of the 2 year analyses will be used to determine the need for Hydromodification as required by the County of Orange.

5.0 HYDRAULICS

5.1 HYDROLOGY

The proposed discharge for this analysis was determined by a hydrology study included in this report as Appendix 3

5.2 STORM FREQUENCY

Consistent with the design criteria set forth in Section 4.1 of this report, a storm frequency of 25 year was used.

5.3 METHODOLOGY

The main line storm drain system was sized to convey the proposed condition discharge to the existing 72" line in South Street. As discussed with the City the hydraulic grade line control was set at 1' below flow line of curb and gutter in South Street. This approach was also used previously at the Colony Park project, also located in the City of Anaheim. (See Appendix 7).

The 100 year flow in Santa Ana Street was analyzed to confirm that the flow remains within the street right of way. No changes are proposed to the surface flow in South street. However, the drainage area to South Street adjacent to the project was analyzed as part of this report. Street flow analysis for Santa Ana & South Streets is included in Appendix 8.

6.0 DESIGN CRITERIA

The proposed storm drain system will be designed to be consistent with the following goals and guidelines as presented in the Orange County Hydrology and the Orange County Local Drainage Manuals. Some items listed below may not apply to this project.

All habitable buildings shall be protected from flooding during a 100-year frequency storm.

Offsite design storm frequency, subject to individual review by the controlling authority, should be in accordance with the O.C. Hydrology Manual.

Velocity should not exceed 20 FPS in a standard wall R.C.P.

On local streets, flow should not exceed top of curb, for a 10-year storm event, and in sump conditions, a 25-year storm event shall be used.

Maximum W.S. in CB's for design conditions shall be 0.5' below inlet (FL.) elevation.

Once water is picked up in a storm drain, it should remain in the system.

Pipe size may not be decreased downstream without the City's approval.

Branching of flow is not allowed.

Junction structures should be designed according to the Orange County Local Drainage Manual.

Fill Less Than 20 Feet over structures unless special design is approved.

Normal criteria for storm drain design shall be followed.

7.0 MASTER PLAN OF DRAINAGE

The project area lies within Drainage Area 19 of the City of Anaheim, Barber City Channel, Master Plan of Drainage dated June 2009. The project area is near the up-stream end of the drainage area as shown on the Drainage Area Map included within the Master Plan of Drainage. The existing 72" line in South Street, that the proposed project flows to, is not shown as deficient in capacity and no improvement to it is proposed in the Master Plan. The proposed project runoff is less than existing for all storm events and therefore, the existing 72" will continue perform without improvements as a result of this development. The Master Plan of Drainage for this area is included in Appendix 5.

8.0 RESULTS AND CONCLUSIONS

8.1 SUMMARY OF EXISTING AND PROPOSED FLOWS

Existing Conditions

	2 Year	10 Year	25 Year	100 Year
Discharge (cfs)	37.22	68.64	82.54	106.27
Time of Concentration (min)	14.44	13.88	15.02	14.77

Proposed Conditions

	2 Year	10 Year	25 Year	100 Year
Discharge (cfs)	36.41	68.05	80.92	105.75
Time of Concentration (min)	16.35	15.19	14.90	14.74

8.2 EXISTING DRAINAGE & FLOOD PLAIN STUDIES

The project is located in Flood Zone X per Flood Insurance Rate Map (FIRM) Number 06059C0134J, revised December 3, 2009. The project outside the limits of the 100 year flood plain.

8.3 CONCLUSIONS

The analysis provided in this report provides the following conclusions:

1. The project can be constructed and meet all requirements of the County of Orange with the construction of appropriate storm drain facilities.
2. Overflow protection, flowing to adjacent streets is provided.
3. No improvements are required to the existing storm drain facilities located in adjacent streets.

9.0 APPENDICES

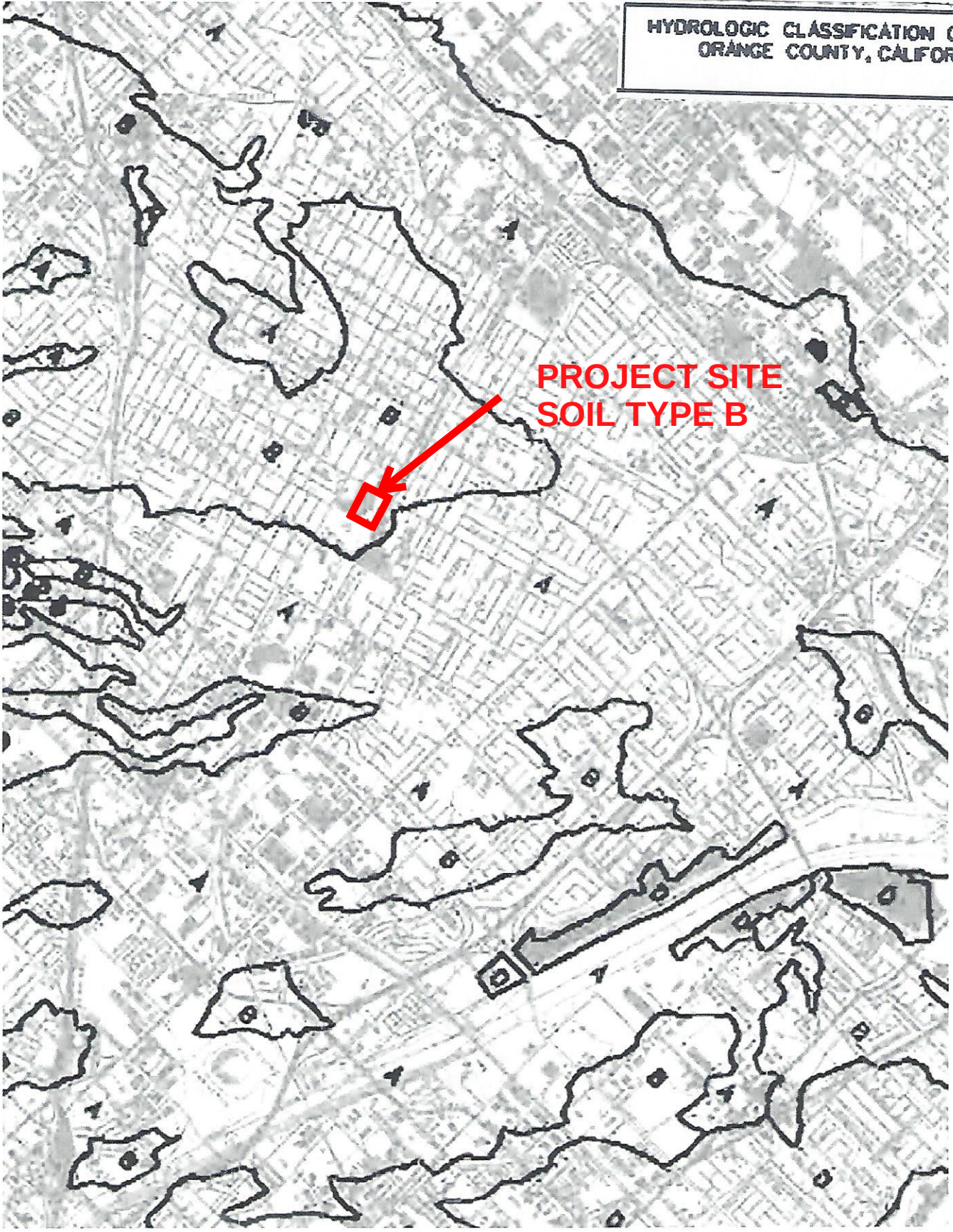
Appendix 1 Soils Map
Appendix 2 Existing Hydrology Studies
Appendix 3 Proposed Hydrology Studies
Appendix 4 Off Site Drainage Area Exhibit (In Pocket)
Appendix 5 Master Plan of Drainage
Appendix 6 Proposed Storm Drain Exhibit (In Pocket)
Appendix 7 Hydraulic Analysis of Proposed Storm Drain
Appendix 8 Street Flow Analysis of Santa Ana & South Streets
Appendix 9 Ponding Exhibit (In Pocket)
Appendix 10 Existing Hydrology Map (In Pocket)
Appendix 11 Proposed Hydrology Map South Street (In Pocket)
Appendix 12 Proposed Hydrology Map (In Pocket)

APPENDIX 1

SOILS MAP

HYDROLOGIC CLASSIFICATION OF SOILS
ORANGE COUNTY, CALIFORNIA

PLATE A



ORANGE COUNTY
HYDROLOGY MANUAL

LEGEND

A B C D — HYDROLOGIC SOIL GROUPS

HYDROLOGIC SOIL GROUP BOUNDARY

APPENDIX 2
EXISTING HYDROLOGY STUDIES

```
_____________________________________________________________________________
*****************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
        (c) Copyright 1983-2013 Advanced Engineering Software (aes)
            Ver. 20.0  Release Date: 06/01/2013  License ID 1654

                          Analysis prepared by:

                           FUSCOE ENGINEERING, Inc
                         16795 Von Karman Ave., #100
                              Irvine, CA 92606
                                949-474-1960
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```
 ************************** DESCRIPTION OF STUDY **************************
* FREEMAN                                                                 *
* EXISTING CONDITION                                                      *
* 2 YEAR ANALYSIS                                                         *
 *************************************************************************

  FILE NAME: FREX2.DAT
  TIME/DATE OF STUDY: 08:58 05/29/2017
=============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
=============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) I ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   24.0     19.0    0.020/0.020/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.67 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

*****************************************************************************
  FLOW PROCESS FROM NODE     10.00 TO NODE     32.00 IS CODE =  21
```

```
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   265.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.50  DOWNSTREAM(FEET) =    166.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.337
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.688
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        0.15      0.30     0.100    36    8.34
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.22
  TOTAL AREA(ACRES) =      0.15   PEAK FLOW RATE(CFS) =      0.22

****************************************************************************
  FLOW PROCESS FROM NODE     32.00 TO NODE     11.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  166.30  DOWNSTREAM ELEVATION(FEET) =  165.10
  STREET LENGTH(FEET) =   210.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 25.00

  DISTANCE FROM CROWN 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) =       0.30
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.20
    HALFSTREET FLOOD WIDTH(FEET) =    3.58
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.21
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.24
  STREET FLOW TRAVEL TIME(MIN.) =   2.88   Tc(MIN.) =   11.22
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.423
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        0.12      0.30     0.100    36
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.12      SUBAREA RUNOFF(CFS) =    0.15
  EFFECTIVE AREA(ACRES) =      0.27    AREA-AVERAGED Fm(INCH/HR) =  0.03
```

```
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        0.3        PEAK FLOW RATE(CFS) =       0.34

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.21   HALFSTREET FLOOD WIDTH(FEET) =   4.00
  FLOW VELOCITY(FEET/SEC.) =  1.22   DEPTH*VELOCITY(FT*FT/SEC.) =   0.25
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     11.00 =     475.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     11.00 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.) =   11.22
  RAINFALL INTENSITY(INCH/HR) =   1.42
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       0.27
  TOTAL STREAM AREA(ACRES) =       0.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.34

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE     11.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   210.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.00  DOWNSTREAM(FEET) =    165.10

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.680
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.769
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        0.76      0.30      0.100    36    7.68
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      1.19
  TOTAL AREA(ACRES) =      0.76   PEAK FLOW RATE(CFS) =      1.19

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     11.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.68
```

```
 RAINFALL INTENSITY(INCH/HR) =   1.77
 AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       0.76
 TOTAL STREAM AREA(ACRES) =       0.76
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.19

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1        0.34   11.22    1.423  0.30( 0.03) 0.10       0.3      10.00
     2        1.19    7.68    1.769  0.30( 0.03) 0.10       0.8      12.00

 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        1.48    7.68    1.769  0.30( 0.03) 0.10       0.9      12.00
     2        1.29   11.22    1.423  0.30( 0.03) 0.10       1.0      10.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       1.48    Tc(MIN.) =     7.68
 EFFECTIVE AREA(ACRES) =       0.94   AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =        1.0
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     11.00 =     475.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     11.00 TO NODE     13.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  165.10  DOWNSTREAM ELEVATION(FEET) =  164.20
 STREET LENGTH(FEET) =   455.00   CURB HEIGHT(INCHES) =  8.0
 STREET HALFWIDTH(FEET) = 24.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  19.00
 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) =       1.67
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.39
   HALFSTREET FLOOD WIDTH(FEET) =   11.49
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.11
```

```
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.43
 STREET FLOW TRAVEL TIME(MIN.) =   6.84   Tc(MIN.) =   14.52
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.227
 SUBAREA LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B        0.36      0.30     0.100    36
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    0.36      SUBAREA RUNOFF(CFS) =    0.39
 EFFECTIVE AREA(ACRES) =      1.30    AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =        1.4        PEAK FLOW RATE(CFS) =       1.48
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.37   HALFSTREET FLOOD WIDTH(FEET) =  10.83
 FLOW VELOCITY(FEET/SEC.) =  1.09   DEPTH*VELOCITY(FT*FT/SEC.) =   0.41
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     13.00 =     930.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   14.52
 RAINFALL INTENSITY(INCH/HR) =   1.23
 AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       1.30
 TOTAL STREAM AREA(ACRES) =       1.39
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.48

****************************************************************************
 FLOW PROCESS FROM NODE     14.00 TO NODE     15.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   125.00
 ELEVATION DATA: UPSTREAM(FEET) =    164.60  DOWNSTREAM(FEET) =    164.20

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.616
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.928
 SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 COMMERCIAL                 B        0.15      0.30     0.100    36    6.62
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
```

```
  SUBAREA RUNOFF(CFS) =      0.26
  TOTAL AREA(ACRES) =      0.15   PEAK FLOW RATE(CFS) =      0.26

****************************************************************************
  FLOW PROCESS FROM NODE     15.00 TO NODE     13.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   159.30  DOWNSTREAM(FEET) =   159.20
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   2.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.41
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.26
  PIPE TRAVEL TIME(MIN.) =   0.59    Tc(MIN.) =    7.21
  LONGEST FLOWPATH FROM NODE     14.00 TO NODE     13.00 =     175.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.21
  RAINFALL INTENSITY(INCH/HR) =   1.83
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       0.15
  TOTAL STREAM AREA(ACRES) =       0.15
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.26

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        1.48   14.52    1.227  0.30( 0.03) 0.10       1.3      12.00
      1        1.31   18.29    1.075  0.30( 0.03) 0.10       1.4      10.00
      2        0.26    7.21    1.835  0.30( 0.03) 0.10       0.2      14.00

  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        1.36    7.21    1.835  0.30( 0.03) 0.10       0.8      14.00
      2        1.65   14.52    1.227  0.30( 0.03) 0.10       1.5      12.00
      3        1.46   18.29    1.075  0.30( 0.03) 0.10       1.5      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       1.65    Tc(MIN.) =    14.52
```

```
  EFFECTIVE AREA(ACRES) =       1.45   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        1.5
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     13.00 =     930.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     16.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   159.20  DOWNSTREAM(FEET) =   158.10
  FLOW LENGTH(FEET) =   285.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.02
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.65
  PIPE TRAVEL TIME(MIN.) =   1.57    Tc(MIN.) =   16.09
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     16.00 =    1215.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 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.) =   16.09
  RAINFALL INTENSITY(INCH/HR) =   1.16
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       1.45
  TOTAL STREAM AREA(ACRES) =       1.54
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.65

****************************************************************************
  FLOW PROCESS FROM NODE     17.00 TO NODE     16.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   310.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.00  DOWNSTREAM(FEET) =    164.90

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.320
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.583
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        1.52      0.30     0.100    36    9.32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
```

```
  SUBAREA RUNOFF(CFS) =      2.13
  TOTAL AREA(ACRES) =      1.52   PEAK FLOW RATE(CFS) =      2.13

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 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.) =    9.32
  RAINFALL INTENSITY(INCH/HR) =   1.58
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       1.52
  TOTAL STREAM AREA(ACRES) =       1.52
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.13

****************************************************************************
  FLOW PROCESS FROM NODE     18.00 TO NODE     19.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   320.00
  ELEVATION DATA: UPSTREAM(FEET) =    165.90  DOWNSTREAM(FEET) =    165.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.888
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.530
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        1.26      0.30     0.100    36    9.89
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      1.70
  TOTAL AREA(ACRES) =      1.26   PEAK FLOW RATE(CFS) =      1.70

****************************************************************************
  FLOW PROCESS FROM NODE     19.00 TO NODE     16.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    165.00  DOWNSTREAM(FEET) =    164.90
  CHANNEL LENGTH THRU SUBAREA(FEET) =   265.00   CHANNEL SLOPE =  0.0004
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   0.040
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
  CHANNEL FLOW THRU SUBAREA(CFS) =       1.70
  FLOW VELOCITY(FEET/SEC.) =   1.05   FLOW DEPTH(FEET) =   0.54
  TRAVEL TIME(MIN.) =   4.23   Tc(MIN.) =   14.11
  LONGEST FLOWPATH FROM NODE     18.00 TO NODE     16.00 =     585.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 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.) =   14.11
  RAINFALL INTENSITY(INCH/HR) =   1.25
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       1.26
  TOTAL STREAM AREA(ACRES) =       1.26
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.70

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        1.36    8.86    1.630  0.30( 0.03) 0.10       0.8      14.00
      1        1.65   16.09    1.157  0.30( 0.03) 0.10       1.5      12.00
      1        1.46   19.91    1.024  0.30( 0.03) 0.10       1.5      10.00
      2        2.13    9.32    1.583  0.30( 0.03) 0.10       1.5      17.00
      3        1.70   14.11    1.248  0.30( 0.03) 0.10       1.3      18.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        4.85    8.86    1.630  0.30( 0.03) 0.10       3.0      14.00
      2        4.94    9.32    1.583  0.30( 0.03) 0.10       3.2      17.00
      3        4.98   14.11    1.248  0.30( 0.03) 0.10       4.1      18.00
      4        4.77   16.09    1.157  0.30( 0.03) 0.10       4.2      12.00
      5        4.21   19.91    1.024  0.30( 0.03) 0.10       4.3      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       4.98    Tc(MIN.) =    14.11
  EFFECTIVE AREA(ACRES) =       4.05   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        4.3
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     16.00 =    1215.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     20.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   158.10  DOWNSTREAM(FEET) =   157.60
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
```

```
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  10.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.81
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.98
  PIPE TRAVEL TIME(MIN.) =   0.66    Tc(MIN.) =   14.77
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     20.00 =    1365.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     20.00 TO NODE     20.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.77
  RAINFALL INTENSITY(INCH/HR) =   1.22
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       4.05
  TOTAL STREAM AREA(ACRES) =       4.32
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       4.98

****************************************************************************
  FLOW PROCESS FROM NODE     21.00 TO NODE     22.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   260.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.00  DOWNSTREAM(FEET) =    165.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.819
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.537
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        0.64      0.30      0.100    36    9.82
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.87
  TOTAL AREA(ACRES) =      0.64   PEAK FLOW RATE(CFS) =      0.87

****************************************************************************
  FLOW PROCESS FROM NODE     22.00 TO NODE     20.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   158.20  DOWNSTREAM(FEET) =   157.60
  FLOW LENGTH(FEET) =    20.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   3.1 INCHES
```

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.46
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.87
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =    9.88
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     20.00 =     280.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     20.00 TO NODE     20.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.88
  RAINFALL INTENSITY(INCH/HR) =   1.53
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       0.64
  TOTAL STREAM AREA(ACRES) =       0.64
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.87

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        4.85    9.53    1.564  0.30( 0.03) 0.10       3.0      14.00
      1        4.94    9.98    1.523  0.30( 0.03) 0.10       3.2      17.00
      1        4.98   14.77    1.216  0.30( 0.03) 0.10       4.1      18.00
      1        4.77   16.76    1.131  0.30( 0.03) 0.10       4.2      12.00
      1        4.21   20.60    1.004  0.30( 0.03) 0.10       4.3      10.00
      2        0.87    9.88    1.531  0.30( 0.03) 0.10       0.6      21.00

  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        5.70    9.53    1.564  0.30( 0.03) 0.10       3.7      14.00
      2        5.79    9.88    1.531  0.30( 0.03) 0.10       3.8      21.00
      3        5.80    9.98    1.523  0.30( 0.03) 0.10       3.8      17.00
      4        5.67   14.77    1.216  0.30( 0.03) 0.10       4.7      18.00
      5        5.40   16.76    1.131  0.30( 0.03) 0.10       4.9      12.00
      6        4.77   20.60    1.004  0.30( 0.03) 0.10       5.0      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       5.80    Tc(MIN.) =     9.98
  EFFECTIVE AREA(ACRES) =       3.83   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        5.0
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     20.00 =    1365.00 FEET.

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

```
 FLOW PROCESS FROM NODE     20.00 TO NODE     23.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   157.60  DOWNSTREAM(FEET) =   156.40
 FLOW LENGTH(FEET) =   365.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  11.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.94
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       5.80
 PIPE TRAVEL TIME(MIN.) =   1.54    Tc(MIN.) =   11.52
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     23.00 =    1730.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     23.00 TO NODE     23.00 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.) =   11.52
 RAINFALL INTENSITY(INCH/HR) =   1.40
 AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       3.83
 TOTAL STREAM AREA(ACRES) =       4.96
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       5.80

****************************************************************************
 FLOW PROCESS FROM NODE     24.00 TO NODE     25.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   320.00
 ELEVATION DATA: UPSTREAM(FEET) =    166.00  DOWNSTREAM(FEET) =    165.50

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.122
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.431
 SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 COMMERCIAL                 B        1.40      0.30      0.100    36   11.12
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =      1.76
 TOTAL AREA(ACRES) =      1.40   PEAK FLOW RATE(CFS) =      1.76

****************************************************************************
 FLOW PROCESS FROM NODE     25.00 TO NODE     26.00 IS CODE =  51
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    165.50  DOWNSTREAM(FEET) =    161.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =   330.00   CHANNEL SLOPE =  0.0133
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   0.020
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.275
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        3.87      0.30     0.100    36
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.23
  AVERAGE FLOW DEPTH(FEET) =   0.09   TRAVEL TIME(MIN.) =   2.47
  Tc(MIN.) =   13.59
  SUBAREA AREA(ACRES) =     3.87       SUBAREA RUNOFF(CFS) =    4.34
  EFFECTIVE AREA(ACRES) =      5.27     AREA-AVERAGED Fm(INCH/HR) =   0.03
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.10
  TOTAL AREA(ACRES) =        5.3         PEAK FLOW RATE(CFS) =       5.90

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.11   FLOW VELOCITY(FEET/SEC.) =   2.65
  LONGEST FLOWPATH FROM NODE     24.00 TO NODE     26.00 =     650.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     26.00 TO NODE     23.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   158.00  DOWNSTREAM(FEET) =   156.40
  FLOW LENGTH(FEET) =   315.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  10.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.65
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.90
  PIPE TRAVEL TIME(MIN.) =   1.13    Tc(MIN.) =   14.72
  LONGEST FLOWPATH FROM NODE     24.00 TO NODE     23.00 =     965.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     23.00 TO NODE     23.00 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.) =   14.72
  RAINFALL INTENSITY(INCH/HR) =   1.22
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
```

```
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       5.27
 TOTAL STREAM AREA(ACRES) =       5.27
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       5.90

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        5.70   11.08    1.434  0.30( 0.03) 0.10       3.7      14.00
     1        5.79   11.43    1.409  0.30( 0.03) 0.10       3.8      21.00
     1        5.80   11.52    1.402  0.30( 0.03) 0.10       3.8      17.00
     1        5.67   16.32    1.148  0.30( 0.03) 0.10       4.7      18.00
     1        5.40   18.33    1.074  0.30( 0.03) 0.10       4.9      12.00
     1        4.77   22.23    0.961  0.30( 0.03) 0.10       5.0      10.00
     2        5.90   14.72    1.218  0.30( 0.03) 0.10       5.3      24.00

 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       10.95   11.08    1.434  0.30( 0.03) 0.10       7.6      14.00
     2       11.11   11.43    1.409  0.30( 0.03) 0.10       7.9      21.00
     3       11.14   11.52    1.402  0.30( 0.03) 0.10       8.0      17.00
     4       11.62   14.72    1.218  0.30( 0.03) 0.10       9.7      24.00
     5       11.23   16.32    1.148  0.30( 0.03) 0.10      10.0      18.00
     6       10.59   18.33    1.074  0.30( 0.03) 0.10      10.1      12.00
     7        9.40   22.23    0.961  0.30( 0.03) 0.10      10.2      10.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      11.62    Tc(MIN.) =    14.72
 EFFECTIVE AREA(ACRES) =       9.68   AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =       10.2
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     23.00 =    1730.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     23.00 TO NODE     27.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   156.40  DOWNSTREAM(FEET) =   155.40
 FLOW LENGTH(FEET) =   235.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  30.0 INCH PIPE IS  14.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.16
 GIVEN PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      11.62
 PIPE TRAVEL TIME(MIN.) =   0.76    Tc(MIN.) =   15.48
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     27.00 =    1965.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     27.00 TO NODE     27.00 IS CODE =   1
```

```
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.48
  RAINFALL INTENSITY(INCH/HR) =   1.18
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       9.68
  TOTAL STREAM AREA(ACRES) =      10.23
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      11.62

****************************************************************************
  FLOW PROCESS FROM NODE     28.00 TO NODE     29.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   225.00
  ELEVATION DATA: UPSTREAM(FEET) =    170.00  DOWNSTREAM(FEET) =    166.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.101
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  2.019
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        1.32      0.30     0.100    36    6.10
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      2.36
  TOTAL AREA(ACRES) =      1.32   PEAK FLOW RATE(CFS) =      2.36

****************************************************************************
  FLOW PROCESS FROM NODE     29.00 TO NODE     30.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    164.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.0077
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   1.500
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.777
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        2.72      0.30     0.100    36
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.51
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.29
```

```
  AVERAGE FLOW DEPTH(FEET) =   0.25   TRAVEL TIME(MIN.) =   1.52
  Tc(MIN.) =    7.62
  SUBAREA AREA(ACRES) =     2.72       SUBAREA RUNOFF(CFS) =    4.28
  EFFECTIVE AREA(ACRES) =      4.04     AREA-AVERAGED Fm(INCH/HR) =   0.03
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.10
  TOTAL AREA(ACRES) =        4.0         PEAK FLOW RATE(CFS) =       6.35

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.32   FLOW VELOCITY(FEET/SEC.) =   3.68
  LONGEST FLOWPATH FROM NODE     28.00 TO NODE     30.00 =     525.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE     30.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.40  DOWNSTREAM(FEET) =    164.20

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.381
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.810
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        2.23      0.30     0.100    36    7.38
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    2.23   INITIAL SUBAREA RUNOFF(CFS) =    3.57

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =    7.62
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.777
  SUBAREA AREA(ACRES) =    2.23      SUBAREA RUNOFF(CFS) =    3.51
  EFFECTIVE AREA(ACRES) =      6.27   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        6.3       PEAK FLOW RATE(CFS) =       9.86

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE     27.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   158.00  DOWNSTREAM(FEET) =   155.40
  FLOW LENGTH(FEET) =   160.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS   9.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.16
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.86
  PIPE TRAVEL TIME(MIN.) =   0.33    Tc(MIN.) =    7.95
  LONGEST FLOWPATH FROM NODE     28.00 TO NODE     27.00 =     685.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     27.00 TO NODE     27.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.95
  RAINFALL INTENSITY(INCH/HR) =   1.73
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       6.27
  TOTAL STREAM AREA(ACRES) =       6.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       9.86

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       10.95   11.85    1.380  0.30( 0.03) 0.10       7.6      14.00
      1       11.11   12.19    1.357  0.30( 0.03) 0.10       7.9      21.00
      1       11.14   12.29    1.351  0.30( 0.03) 0.10       8.0      17.00
      1       11.62   15.48    1.183  0.30( 0.03) 0.10       9.7      24.00
      1       11.23   17.09    1.118  0.30( 0.03) 0.10      10.0      18.00
      1       10.59   19.11    1.049  0.30( 0.03) 0.10      10.1      12.00
      1        9.40   23.03    0.942  0.30( 0.03) 0.10      10.2      10.00
      2        9.86    7.95    1.735  0.30( 0.03) 0.10       6.3      28.00

  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       19.14    7.95    1.735  0.30( 0.03) 0.10      11.4      28.00
      2       18.76   11.85    1.380  0.30( 0.03) 0.10      13.9      14.00
      3       18.78   12.19    1.357  0.30( 0.03) 0.10      14.2      21.00
      4       18.78   12.29    1.351  0.30( 0.03) 0.10      14.2      17.00
      5       18.29   15.48    1.183  0.30( 0.03) 0.10      15.9      24.00
      6       17.52   17.09    1.118  0.30( 0.03) 0.10      16.2      18.00
      7       16.48   19.11    1.049  0.30( 0.03) 0.10      16.4      12.00
      8       14.67   23.03    0.942  0.30( 0.03) 0.10      16.5      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      19.14    Tc(MIN.) =     7.95
  EFFECTIVE AREA(ACRES) =      11.38   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       16.5
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     27.00 =    1965.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     27.00 TO NODE     31.00 IS CODE =  41
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   155.40  DOWNSTREAM(FEET) =   155.00
  FLOW LENGTH(FEET) =   105.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  17.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.61
  GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      19.14
  PIPE TRAVEL TIME(MIN.) =   0.31    Tc(MIN.) =    8.26
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     31.00 =    2070.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     31.00 TO NODE     31.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     32.00 TO NODE     33.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.30  DOWNSTREAM(FEET) =    166.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.850
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.379
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        2.62      0.30      0.100    36   11.85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      3.18
  TOTAL AREA(ACRES) =      2.62   PEAK FLOW RATE(CFS) =      3.18

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     34.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  166.00  DOWNSTREAM ELEVATION(FEET) =  165.60
  STREET LENGTH(FEET) =   485.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 25.00

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

  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) =       5.32
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.47
    HALFSTREET FLOOD WIDTH(FEET) =   17.07
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    0.88
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.41
  STREET FLOW TRAVEL TIME(MIN.) =   9.21   Tc(MIN.) =   21.06
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.992
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        4.89      0.30     0.100    36
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    4.89      SUBAREA RUNOFF(CFS) =    4.23
  EFFECTIVE AREA(ACRES) =      7.51    AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        7.5        PEAK FLOW RATE(CFS) =       6.50

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.49   HALFSTREET FLOOD WIDTH(FEET) =  18.40
  FLOW VELOCITY(FEET/SEC.) =  0.93   DEPTH*VELOCITY(FT*FT/SEC.) =   0.46
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     34.00 =     785.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     34.00 TO NODE     35.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    165.60  DOWNSTREAM(FEET) =    165.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =   180.00   CHANNEL SLOPE =  0.0011
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   0.020
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =       6.50
  FLOW VELOCITY(FEET/SEC.) =   2.08   FLOW DEPTH(FEET) =   0.62
  TRAVEL TIME(MIN.) =   1.44   Tc(MIN.) =   22.50
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     35.00 =     965.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     35.00 TO NODE     35.00 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.) =   22.50
  RAINFALL INTENSITY(INCH/HR) =   0.95
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
```

```
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       7.51
  TOTAL STREAM AREA(ACRES) =       7.51
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       6.50

****************************************************************************
  FLOW PROCESS FROM NODE     35.00 TO NODE     35.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   665.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.20  DOWNSTREAM(FEET) =    165.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.351
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.288
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                B        6.31      0.30     0.100    36   13.35
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      7.15
  TOTAL AREA(ACRES) =      6.31   PEAK FLOW RATE(CFS) =      7.15

****************************************************************************
  FLOW PROCESS FROM NODE     35.00 TO NODE     35.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.35
  RAINFALL INTENSITY(INCH/HR) =   1.29
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       6.31
  TOTAL STREAM AREA(ACRES) =       6.31
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       7.15

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        6.50   22.50    0.955  0.30( 0.03) 0.10       7.5      32.00
      2        7.15   13.35    1.288  0.30( 0.03) 0.10       6.3      35.00

  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       12.39   13.35    1.288  0.30( 0.03) 0.10      10.8      35.00
    2       11.75   22.50    0.955  0.30( 0.03) 0.10      13.8      32.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      12.39    Tc(MIN.) =    13.35
  EFFECTIVE AREA(ACRES) =      10.77   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       13.8
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     35.00 =     965.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     35.00 TO NODE     31.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   159.00  DOWNSTREAM(FEET) =   155.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  15.75
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      12.39
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =   13.40
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     31.00 =    1015.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     31.00 TO NODE     31.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       12.39   13.40    1.285  0.30( 0.03) 0.10      10.8      35.00
      2       11.75   22.56    0.953  0.30( 0.03) 0.10      13.8      32.00
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     31.00 =    1015.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       19.14    8.26    1.697  0.30( 0.03) 0.10      11.4      28.00
      2       18.76   12.16    1.359  0.30( 0.03) 0.10      13.9      14.00
      3       18.78   12.51    1.337  0.30( 0.03) 0.10      14.2      21.00
      4       18.78   12.60    1.331  0.30( 0.03) 0.10      14.2      17.00
      5       18.29   15.80    1.170  0.30( 0.03) 0.10      15.9      24.00
      6       17.52   17.41    1.106  0.30( 0.03) 0.10      16.2      18.00
      7       16.48   19.43    1.038  0.30( 0.03) 0.10      16.4      12.00
      8       14.67   23.36    0.934  0.30( 0.03) 0.10      16.5      10.00
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     31.00 =    2070.00 FEET.

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

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	29.28	8.26	1.697	0.30(0.03)	0.10	18.0	28.00
2	30.66	12.16	1.359	0.30(0.03)	0.10	23.7	14.00
3	30.82	12.51	1.337	0.30(0.03)	0.10	24.2	21.00
4	30.86	12.60	1.331	0.30(0.03)	0.10	24.3	17.00
5	31.05	13.40	1.285	0.30(0.03)	0.10	25.4	35.00
6	30.51	15.80	1.170	0.30(0.03)	0.10	27.5	24.00
7	29.63	17.41	1.106	0.30(0.03)	0.10	28.3	18.00
8	28.45	19.43	1.038	0.30(0.03)	0.10	29.2	12.00
9	26.79	22.56	0.953	0.30(0.03)	0.10	30.3	32.00
10	26.18	23.36	0.934	0.30(0.03)	0.10	30.3	10.00

TOTAL AREA(ACRES) = 30.3

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 31.05 Tc(MIN.) = 13.404
EFFECTIVE AREA(ACRES) = 25.42 AREA-AVERAGED Fm(INCH/HR) = 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 30.3
LONGEST FLOWPATH FROM NODE 10.00 TO NODE 31.00 = 2070.00 FEET.

****
FLOW PROCESS FROM NODE 31.00 TO NODE 36.00 IS CODE = 41

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 155.00 DOWNSTREAM(FEET) = 153.80
FLOW LENGTH(FEET) = 265.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 42.0 INCH PIPE IS 20.3 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 6.75
GIVEN PIPE DIAMETER(INCH) = 42.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 31.05
PIPE TRAVEL TIME(MIN.) = 0.65 Tc(MIN.) = 14.06
LONGEST FLOWPATH FROM NODE 10.00 TO NODE 36.00 = 2335.00 FEET.

****
FLOW PROCESS FROM NODE 36.00 TO NODE 36.00 IS CODE = 1

>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 14.06
RAINFALL INTENSITY(INCH/HR) = 1.25
AREA-AVERAGED Fm(INCH/HR) = 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.10
EFFECTIVE STREAM AREA(ACRES) = 25.42
TOTAL STREAM AREA(ACRES) = 30.32
PEAK FLOW RATE(CFS) AT CONFLUENCE = 31.05

****
FLOW PROCESS FROM NODE 37.00 TO NODE 38.00 IS CODE = 21

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   325.00
  ELEVATION DATA: UPSTREAM(FEET) =    169.50  DOWNSTREAM(FEET) =    168.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.011
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.614
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                B        1.65      0.30     0.100    36    9.01
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      2.35
  TOTAL AREA(ACRES) =      1.65   PEAK FLOW RATE(CFS) =      2.35

********************************************************************************
  FLOW PROCESS FROM NODE     38.00 TO NODE     36.00 IS CODE =  41
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   159.00  DOWNSTREAM(FEET) =   153.80
  FLOW LENGTH(FEET) =    70.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.61
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.35
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =    9.13
  LONGEST FLOWPATH FROM NODE     37.00 TO NODE     36.00 =     395.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE     36.00 TO NODE     36.00 IS CODE =   1
--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.13
  RAINFALL INTENSITY(INCH/HR) =   1.60
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       1.65
  TOTAL STREAM AREA(ACRES) =       1.65
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.35

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       29.28    8.92    1.623  0.30( 0.03) 0.10      18.0      28.00
```

```
      1       30.66   12.82    1.319  0.30( 0.03) 0.10      23.7      14.00
      1       30.82   13.16    1.299  0.30( 0.03) 0.10      24.2      21.00
      1       30.86   13.26    1.293  0.30( 0.03) 0.10      24.3      17.00
      1       31.05   14.06    1.251  0.30( 0.03) 0.10      25.4      35.00
      1       30.51   16.45    1.143  0.30( 0.03) 0.10      27.5      24.00
      1       29.63   18.07    1.083  0.30( 0.03) 0.10      28.3      18.00
      1       28.45   20.10    1.018  0.30( 0.03) 0.10      29.2      12.00
      1       26.79   23.24    0.937  0.30( 0.03) 0.10      30.3      32.00
      1       26.18   24.05    0.919  0.30( 0.03) 0.10      30.3      10.00
      2        2.35    9.13    1.602  0.30( 0.03) 0.10       1.6      37.00

  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       31.61    8.92    1.623  0.30( 0.03) 0.10      19.6      28.00
      2       31.71    9.13    1.602  0.30( 0.03) 0.10      20.0      37.00
      3       32.59   12.82    1.319  0.30( 0.03) 0.10      25.3      14.00
      4       32.72   13.16    1.299  0.30( 0.03) 0.10      25.9      21.00
      5       32.75   13.26    1.293  0.30( 0.03) 0.10      26.0      17.00
      6       32.87   14.06    1.251  0.30( 0.03) 0.10      27.1      35.00
      7       32.18   16.45    1.143  0.30( 0.03) 0.10      29.2      24.00
      8       31.21   18.07    1.083  0.30( 0.03) 0.10      30.0      18.00
      9       29.93   20.10    1.018  0.30( 0.03) 0.10      30.8      12.00
     10       28.15   23.24    0.937  0.30( 0.03) 0.10      32.0      32.00
     11       27.51   24.05    0.919  0.30( 0.03) 0.10      32.0      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      32.87    Tc(MIN.) =    14.06
  EFFECTIVE AREA(ACRES) =      27.07   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       32.0
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     36.00 =    2335.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     36.00 TO NODE     39.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   153.80  DOWNSTREAM(FEET) =   152.80
  FLOW LENGTH(FEET) =   230.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  21.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.75
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      32.87
  PIPE TRAVEL TIME(MIN.) =   0.57    Tc(MIN.) =   14.63
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     39.00 =    2565.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     39.00 TO NODE     39.00 IS CODE =   1
----------------------------------------------------------------------------
```

```
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.63
  RAINFALL INTENSITY(INCH/HR) =   1.22
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =      27.07
  TOTAL STREAM AREA(ACRES) =      31.97
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      32.87

****************************************************************************
  FLOW PROCESS FROM NODE     40.00 TO NODE     39.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   320.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.40  DOWNSTREAM(FEET) =    167.20

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.359
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.288
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        0.48      0.30      0.100    36   13.36
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.54
  TOTAL AREA(ACRES) =      0.48   PEAK FLOW RATE(CFS) =      0.54

****************************************************************************
  FLOW PROCESS FROM NODE     39.00 TO NODE     39.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.36
  RAINFALL INTENSITY(INCH/HR) =   1.29
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       0.48
  TOTAL STREAM AREA(ACRES) =       0.48
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.54

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```

1	31.61	9.50	1.566	0.30(0.03)	0.10	19.6	28.00
1	31.71	9.71	1.547	0.30(0.03)	0.10	20.0	37.00
1	32.59	13.39	1.286	0.30(0.03)	0.10	25.3	14.00
1	32.72	13.73	1.268	0.30(0.03)	0.10	25.9	21.00
1	32.75	13.83	1.263	0.30(0.03)	0.10	26.0	17.00
1	32.87	14.63	1.223	0.30(0.03)	0.10	27.1	35.00
1	32.18	17.03	1.120	0.30(0.03)	0.10	29.2	24.00
1	31.21	18.65	1.063	0.30(0.03)	0.10	30.0	18.00
1	29.93	20.69	1.002	0.30(0.03)	0.10	30.8	12.00
1	28.15	23.83	0.924	0.30(0.03)	0.10	32.0	32.00
1	27.51	24.64	0.906	0.30(0.03)	0.10	32.0	10.00
2	0.54	13.36	1.288	0.30(0.03)	0.10	0.5	40.00

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	32.09	9.50	1.566	0.30(0.03)	0.10	20.0	28.00
2	32.19	9.71	1.547	0.30(0.03)	0.10	20.3	37.00
3	33.13	13.36	1.288	0.30(0.03)	0.10	25.7	40.00
4	33.13	13.39	1.286	0.30(0.03)	0.10	25.8	14.00
5	33.26	13.73	1.268	0.30(0.03)	0.10	26.3	21.00
6	33.28	13.83	1.263	0.30(0.03)	0.10	26.5	17.00
7	33.39	14.63	1.223	0.30(0.03)	0.10	27.6	35.00
8	32.65	17.03	1.120	0.30(0.03)	0.10	29.6	24.00
9	31.65	18.65	1.063	0.30(0.03)	0.10	30.5	18.00
10	30.35	20.69	1.002	0.30(0.03)	0.10	31.3	12.00
11	28.54	23.83	0.924	0.30(0.03)	0.10	32.4	32.00
12	27.89	24.64	0.906	0.30(0.03)	0.10	32.5	10.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 33.39 Tc(MIN.) = 14.63
EFFECTIVE AREA(ACRES) = 27.55 AREA-AVERAGED Fm(INCH/HR) = 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 32.5
LONGEST FLOWPATH FROM NODE 10.00 TO NODE 39.00 = 2565.00 FEET.

****
FLOW PROCESS FROM NODE 39.00 TO NODE 41.00 IS CODE = 41

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 152.80 DOWNSTREAM(FEET) = 152.00
FLOW LENGTH(FEET) = 210.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 48.0 INCH PIPE IS 20.7 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 6.43
GIVEN PIPE DIAMETER(INCH) = 48.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 33.39
PIPE TRAVEL TIME(MIN.) = 0.54 Tc(MIN.) = 15.17
LONGEST FLOWPATH FROM NODE 10.00 TO NODE 41.00 = 2775.00 FEET.

```
****************************************************************************
 FLOW PROCESS FROM NODE     41.00 TO NODE     41.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   15.17
 RAINFALL INTENSITY(INCH/HR) =   1.20
 AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =      27.55
 TOTAL STREAM AREA(ACRES) =      32.45
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      33.39

****************************************************************************
 FLOW PROCESS FROM NODE     42.00 TO NODE     41.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   230.00
 ELEVATION DATA: UPSTREAM(FEET) =    166.00  DOWNSTREAM(FEET) =    163.20

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.464
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.953
 SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 COMMERCIAL                 B        0.66      0.30      0.100    36    6.46
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =      1.14
 TOTAL AREA(ACRES) =      0.66   PEAK FLOW RATE(CFS) =      1.14

****************************************************************************
 FLOW PROCESS FROM NODE     41.00 TO NODE     41.00 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.) =    6.46
 RAINFALL INTENSITY(INCH/HR) =   1.95
 AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       0.66
 TOTAL STREAM AREA(ACRES) =       0.66
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.14
```

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	32.09	10.05	1.517	0.30(0.03)	0.10	20.0	28.00
1	32.19	10.26	1.499	0.30(0.03)	0.10	20.3	37.00
1	33.13	13.90	1.259	0.30(0.03)	0.10	25.7	40.00
1	33.13	13.93	1.257	0.30(0.03)	0.10	25.8	14.00
1	33.26	14.28	1.240	0.30(0.03)	0.10	26.3	21.00
1	33.28	14.37	1.235	0.30(0.03)	0.10	26.5	17.00
1	33.39	15.17	1.197	0.30(0.03)	0.10	27.6	35.00
1	32.65	17.57	1.100	0.30(0.03)	0.10	29.6	24.00
1	31.65	19.20	1.046	0.30(0.03)	0.10	30.5	18.00
1	30.35	21.24	0.987	0.30(0.03)	0.10	31.3	12.00
1	28.54	24.39	0.911	0.30(0.03)	0.10	32.4	32.00
1	27.89	25.21	0.894	0.30(0.03)	0.10	32.5	10.00
2	1.14	6.46	1.953	0.30(0.03)	0.10	0.7	42.00

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	27.85	6.46	1.953	0.30(0.03)	0.10	13.5	42.00
2	32.97	10.05	1.517	0.30(0.03)	0.10	20.6	28.00
3	33.06	10.26	1.499	0.30(0.03)	0.10	21.0	37.00
4	33.86	13.90	1.259	0.30(0.03)	0.10	26.4	40.00
5	33.86	13.93	1.257	0.30(0.03)	0.10	26.4	14.00
6	33.97	14.28	1.240	0.30(0.03)	0.10	27.0	21.00
7	34.00	14.37	1.235	0.30(0.03)	0.10	27.1	17.00
8	34.08	15.17	1.197	0.30(0.03)	0.10	28.2	35.00
9	33.28	17.57	1.100	0.30(0.03)	0.10	30.3	24.00
10	32.26	19.20	1.046	0.30(0.03)	0.10	31.1	18.00
11	30.92	21.24	0.987	0.30(0.03)	0.10	32.0	12.00
12	29.06	24.39	0.911	0.30(0.03)	0.10	33.1	32.00
13	28.40	25.21	0.894	0.30(0.03)	0.10	33.1	10.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 34.08 Tc(MIN.) = 15.17
EFFECTIVE AREA(ACRES) = 28.21 AREA-AVERAGED Fm(INCH/HR) = 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 33.1
LONGEST FLOWPATH FROM NODE 10.00 TO NODE 41.00 = 2775.00 FEET.

****
FLOW PROCESS FROM NODE 41.00 TO NODE 43.00 IS CODE = 41

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 152.00 DOWNSTREAM(FEET) = 151.80
FLOW LENGTH(FEET) = 30.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 48.0 INCH PIPE IS 18.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 7.94

```
  GIVEN PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      34.08
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =   15.23
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     43.00 =    2805.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     43.00 TO NODE     43.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     44.00 TO NODE     45.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   350.00
  ELEVATION DATA: UPSTREAM(FEET) =    164.00  DOWNSTREAM(FEET) =    162.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.894
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.626
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        1.55      0.30     0.100    36    8.89
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      2.23
  TOTAL AREA(ACRES) =      1.55   PEAK FLOW RATE(CFS) =      2.23

****************************************************************************
  FLOW PROCESS FROM NODE     45.00 TO NODE     46.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    162.00  DOWNSTREAM(FEET) =    161.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =   165.00   CHANNEL SLOPE =  0.0012
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   0.040
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
  CHANNEL FLOW THRU SUBAREA(CFS) =       2.23
  FLOW VELOCITY(FEET/SEC.) =   1.69   FLOW DEPTH(FEET) =   0.44
  TRAVEL TIME(MIN.) =   1.63   Tc(MIN.) =   10.53
  LONGEST FLOWPATH FROM NODE     44.00 TO NODE     46.00 =     515.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     46.00 TO NODE     46.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
```

```
  TIME OF CONCENTRATION(MIN.) =   10.53
  RAINFALL INTENSITY(INCH/HR) =   1.48
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       1.55
  TOTAL STREAM AREA(ACRES) =       1.55
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.23

****************************************************************************
  FLOW PROCESS FROM NODE     47.00 TO NODE     46.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   285.00
  ELEVATION DATA: UPSTREAM(FEET) =    165.00  DOWNSTREAM(FEET) =    161.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.157
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.842
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        1.23      0.30     0.100    36    7.16
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      2.01
  TOTAL AREA(ACRES) =      1.23   PEAK FLOW RATE(CFS) =      2.01

****************************************************************************
  FLOW PROCESS FROM NODE     46.00 TO NODE     46.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.16
  RAINFALL INTENSITY(INCH/HR) =   1.84
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       1.23
  TOTAL STREAM AREA(ACRES) =       1.23
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.01

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        2.23   10.53    1.477  0.30( 0.03) 0.10       1.5      44.00
      2        2.01    7.16    1.842  0.30( 0.03) 0.10       1.2      47.00

  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        3.90    7.16    1.842  0.30( 0.03) 0.10       2.3      47.00
      2        3.83   10.53    1.477  0.30( 0.03) 0.10       2.8      44.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       3.90    Tc(MIN.) =     7.16
  EFFECTIVE AREA(ACRES) =       2.28   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        2.8
  LONGEST FLOWPATH FROM NODE     44.00 TO NODE     46.00 =     515.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     46.00 TO NODE     43.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   157.00  DOWNSTREAM(FEET) =   151.80
  FLOW LENGTH(FEET) =   115.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.33
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.90
  PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =    7.36
  LONGEST FLOWPATH FROM NODE     44.00 TO NODE     43.00 =     630.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     43.00 TO NODE     43.00 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        3.90    7.36    1.813  0.30( 0.03) 0.10       2.3      47.00
      2        3.83   10.73    1.460  0.30( 0.03) 0.10       2.8      44.00
  LONGEST FLOWPATH FROM NODE     44.00 TO NODE     43.00 =     630.00 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       27.85    6.53    1.942  0.30( 0.03) 0.10      13.5      42.00
      2       32.97   10.11    1.511  0.30( 0.03) 0.10      20.6      28.00
      3       33.06   10.32    1.494  0.30( 0.03) 0.10      21.0      37.00
      4       33.86   13.97    1.255  0.30( 0.03) 0.10      26.4      40.00
      5       33.86   14.00    1.254  0.30( 0.03) 0.10      26.4      14.00
      6       33.97   14.34    1.237  0.30( 0.03) 0.10      27.0      21.00
      7       34.00   14.44    1.232  0.30( 0.03) 0.10      27.1      17.00
      8       34.08   15.23    1.194  0.30( 0.03) 0.10      28.2      35.00
```

9	33.28	17.64	1.098	0.30(0.03)	0.10	30.3	24.00
10	32.26	19.26	1.044	0.30(0.03)	0.10	31.1	18.00
11	30.92	21.31	0.985	0.30(0.03)	0.10	32.0	12.00
12	29.06	24.46	0.910	0.30(0.03)	0.10	33.1	32.00
13	28.40	25.28	0.893	0.30(0.03)	0.10	33.1	10.00

LONGEST FLOWPATH FROM NODE 10.00 TO NODE 43.00 = 2805.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31.57	6.53	1.942	0.30(0.03)	0.10	15.5	42.00
2	32.95	7.36	1.813	0.30(0.03)	0.10	17.4	47.00
3	36.81	10.11	1.511	0.30(0.03)	0.10	23.3	28.00
4	36.90	10.32	1.494	0.30(0.03)	0.10	23.7	37.00
5	36.98	10.73	1.460	0.30(0.03)	0.10	24.4	44.00
6	37.14	13.97	1.255	0.30(0.03)	0.10	29.2	40.00
7	37.14	14.00	1.254	0.30(0.03)	0.10	29.2	14.00
8	37.20	14.34	1.237	0.30(0.03)	0.10	29.8	21.00
9	37.22	14.44	1.232	0.30(0.03)	0.10	29.9	17.00
10	37.20	15.23	1.194	0.30(0.03)	0.10	31.0	35.00
11	36.14	17.64	1.098	0.30(0.03)	0.10	33.1	24.00
12	34.97	19.26	1.044	0.30(0.03)	0.10	33.9	18.00
13	33.47	21.31	0.985	0.30(0.03)	0.10	34.8	12.00
14	31.42	24.46	0.910	0.30(0.03)	0.10	35.9	32.00
15	30.71	25.28	0.893	0.30(0.03)	0.10	35.9	10.00

TOTAL AREA(ACRES) = 35.9

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 37.22 Tc(MIN.) = 14.435
EFFECTIVE AREA(ACRES) = 29.92 AREA-AVERAGED Fm(INCH/HR) = 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 35.9
LONGEST FLOWPATH FROM NODE 10.00 TO NODE 43.00 = 2805.00 FEET.

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 35.9 TC(MIN.) = 14.44
EFFECTIVE AREA(ACRES) = 29.92 AREA-AVERAGED Fm(INCH/HR)= 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.100
PEAK FLOW RATE(CFS) = 37.22

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	31.57	6.53	1.942	0.30(0.03)	0.10	15.5	42.00
2	32.95	7.36	1.813	0.30(0.03)	0.10	17.4	47.00
3	36.81	10.11	1.511	0.30(0.03)	0.10	23.3	28.00
4	36.90	10.32	1.494	0.30(0.03)	0.10	23.7	37.00
5	36.98	10.73	1.460	0.30(0.03)	0.10	24.4	44.00
6	37.14	13.97	1.255	0.30(0.03)	0.10	29.2	40.00
7	37.14	14.00	1.254	0.30(0.03)	0.10	29.2	14.00
8	37.20	14.34	1.237	0.30(0.03)	0.10	29.8	21.00
9	37.22	14.44	1.232	0.30(0.03)	0.10	29.9	17.00
10	37.20	15.23	1.194	0.30(0.03)	0.10	31.0	35.00
11	36.14	17.64	1.098	0.30(0.03)	0.10	33.1	24.00

12	34.97	19.26	1.044	0.30(0.03)	0.10	33.9	18.00
13	33.47	21.31	0.985	0.30(0.03)	0.10	34.8	12.00
14	31.42	24.46	0.910	0.30(0.03)	0.10	35.9	32.00
15	30.71	25.28	0.893	0.30(0.03)	0.10	35.9	10.00

END OF RATIONAL METHOD ANALYSIS

```
_____________________________________________________________________________
*****************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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            Ver. 20.0  Release Date: 06/01/2013  License ID 1654

                              Analysis prepared by:

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                               Irvine, CA 92606
                                949-474-1960
```

```
 ************************** DESCRIPTION OF STUDY **************************
* FREEMAN                                                                 *
* EXISTING CONDITION                                                      *
* 10 YEAR ANALYSIS                                                        *
 *************************************************************************

  FILE NAME: FREX10.DAT
  TIME/DATE OF STUDY: 09:01 05/29/2017
=============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
=============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   24.0     19.0    0.020/0.020/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.67 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

*****************************************************************************
  FLOW PROCESS FROM NODE     10.00 TO NODE     32.00 IS CODE =  21
```

```
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   265.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.50  DOWNSTREAM(FEET) =    166.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.337
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.029
  SUBAREA Tc 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        0.15      0.30     0.100    56    8.34
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.40
  TOTAL AREA(ACRES) =      0.15   PEAK FLOW RATE(CFS) =      0.40

****************************************************************************
  FLOW PROCESS FROM NODE     32.00 TO NODE     11.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  166.30  DOWNSTREAM ELEVATION(FEET) =  165.10
  STREET LENGTH(FEET) =   210.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 25.00

  DISTANCE FROM CROWN 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) =       0.54
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.24
    HALFSTREET FLOOD WIDTH(FEET) =    5.48
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.30
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.31
  STREET FLOW TRAVEL TIME(MIN.) =   2.70   Tc(MIN.) =   11.04
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.579
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        0.12      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) =    0.12      SUBAREA RUNOFF(CFS) =    0.28
  EFFECTIVE AREA(ACRES) =      0.27    AREA-AVERAGED Fm(INCH/HR) =  0.03
```

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  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        0.3        PEAK FLOW RATE(CFS) =       0.62

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.24   HALFSTREET FLOOD WIDTH(FEET) =   5.90
  FLOW VELOCITY(FEET/SEC.) =  1.33   DEPTH*VELOCITY(FT*FT/SEC.) =   0.32
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     11.00 =     475.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     11.00 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.) =   11.04
  RAINFALL INTENSITY(INCH/HR) =   2.58
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       0.27
  TOTAL STREAM AREA(ACRES) =       0.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.62

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE     11.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   210.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.00  DOWNSTREAM(FEET) =    165.10

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.680
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.174
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        0.76      0.30      0.100    56    7.68
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      2.15
  TOTAL AREA(ACRES) =      0.76   PEAK FLOW RATE(CFS) =      2.15

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     11.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.68
```

```
 RAINFALL INTENSITY(INCH/HR) =   3.17
 AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       0.76
 TOTAL STREAM AREA(ACRES) =       0.76
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.15

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        0.62   11.04    2.579  0.30( 0.03) 0.10       0.3      10.00
     2        2.15    7.68    3.174  0.30( 0.03) 0.10       0.8      12.00

 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        2.68    7.68    3.174  0.30( 0.03) 0.10       0.9      12.00
     2        2.36   11.04    2.579  0.30( 0.03) 0.10       1.0      10.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       2.68    Tc(MIN.) =     7.68
 EFFECTIVE AREA(ACRES) =       0.95   AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =        1.0
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     11.00 =     475.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     11.00 TO NODE     13.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  165.10  DOWNSTREAM ELEVATION(FEET) =  164.20
 STREET LENGTH(FEET) =   455.00   CURB HEIGHT(INCHES) =  8.0
 STREET HALFWIDTH(FEET) = 24.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  19.00
 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) =       3.05
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.45
   HALFSTREET FLOOD WIDTH(FEET) =   14.83
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.28
```

```
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.58
  STREET FLOW TRAVEL TIME(MIN.) =   5.94   Tc(MIN.) =   13.62
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.286
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        0.36      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) =    0.36      SUBAREA RUNOFF(CFS) =    0.73
  EFFECTIVE AREA(ACRES) =      1.31    AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        1.4        PEAK FLOW RATE(CFS) =       2.68
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.44   HALFSTREET FLOOD WIDTH(FEET) =  14.09
  FLOW VELOCITY(FEET/SEC.) =  1.23   DEPTH*VELOCITY(FT*FT/SEC.) =   0.54
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     13.00 =     930.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.62
  RAINFALL INTENSITY(INCH/HR) =   2.29
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       1.31
  TOTAL STREAM AREA(ACRES) =       1.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.68

****************************************************************************
  FLOW PROCESS FROM NODE     14.00 TO NODE     15.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   125.00
  ELEVATION DATA: UPSTREAM(FEET) =    164.60  DOWNSTREAM(FEET) =    164.20

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.616
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.458
  SUBAREA Tc 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        0.15      0.30     0.100    56    6.62
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
```

```
  SUBAREA RUNOFF(CFS) =      0.46
  TOTAL AREA(ACRES) =      0.15   PEAK FLOW RATE(CFS) =      0.46

****************************************************************************
  FLOW PROCESS FROM NODE     15.00 TO NODE     13.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   159.30  DOWNSTREAM(FEET) =   159.20
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.66
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.46
  PIPE TRAVEL TIME(MIN.) =   0.50    Tc(MIN.) =    7.12
  LONGEST FLOWPATH FROM NODE     14.00 TO NODE     13.00 =     175.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.12
  RAINFALL INTENSITY(INCH/HR) =   3.32
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       0.15
  TOTAL STREAM AREA(ACRES) =       0.15
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.46

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        2.68   13.62    2.286  0.30( 0.03) 0.10       1.3      12.00
      1        2.47   17.18    2.001  0.30( 0.03) 0.10       1.4      10.00
      2        0.46    7.12    3.316  0.30( 0.03) 0.10       0.2      14.00

  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        2.50    7.12    3.316  0.30( 0.03) 0.10       0.8      14.00
      2        3.00   13.62    2.286  0.30( 0.03) 0.10       1.5      12.00
      3        2.74   17.18    2.001  0.30( 0.03) 0.10       1.5      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       3.00    Tc(MIN.) =    13.62
```

```
  EFFECTIVE AREA(ACRES) =       1.46   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        1.5
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     13.00 =     930.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     16.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   159.20  DOWNSTREAM(FEET) =   158.10
  FLOW LENGTH(FEET) =   285.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.55
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.00
  PIPE TRAVEL TIME(MIN.) =   1.34    Tc(MIN.) =   14.96
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     16.00 =    1215.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 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.) =   14.96
  RAINFALL INTENSITY(INCH/HR) =   2.17
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       1.46
  TOTAL STREAM AREA(ACRES) =       1.54
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       3.00

****************************************************************************
  FLOW PROCESS FROM NODE     17.00 TO NODE     16.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   310.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.00  DOWNSTREAM(FEET) =    164.90

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.320
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.841
  SUBAREA Tc 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        1.52      0.30     0.100    56    9.32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
```

```
  SUBAREA RUNOFF(CFS) =      3.85
  TOTAL AREA(ACRES) =      1.52   PEAK FLOW RATE(CFS) =      3.85

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 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.) =    9.32
  RAINFALL INTENSITY(INCH/HR) =   2.84
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       1.52
  TOTAL STREAM AREA(ACRES) =       1.52
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       3.85

****************************************************************************
  FLOW PROCESS FROM NODE     18.00 TO NODE     19.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   320.00
  ELEVATION DATA: UPSTREAM(FEET) =    165.90  DOWNSTREAM(FEET) =    165.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.888
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.747
  SUBAREA Tc 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        1.26      0.30     0.100    56    9.89
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      3.08
  TOTAL AREA(ACRES) =      1.26   PEAK FLOW RATE(CFS) =      3.08

****************************************************************************
  FLOW PROCESS FROM NODE     19.00 TO NODE     16.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    165.00  DOWNSTREAM(FEET) =    164.90
  CHANNEL LENGTH THRU SUBAREA(FEET) =   265.00   CHANNEL SLOPE =  0.0004
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   0.040
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
  CHANNEL FLOW THRU SUBAREA(CFS) =       3.08
  FLOW VELOCITY(FEET/SEC.) =   1.26   FLOW DEPTH(FEET) =   0.81
  TRAVEL TIME(MIN.) =   3.50   Tc(MIN.) =   13.39
  LONGEST FLOWPATH FROM NODE     18.00 TO NODE     16.00 =     585.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 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.) =   13.39
  RAINFALL INTENSITY(INCH/HR) =   2.31
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       1.26
  TOTAL STREAM AREA(ACRES) =       1.26
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       3.08

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        2.50    8.52    2.991  0.30( 0.03) 0.10       0.8      14.00
      1        3.00   14.96    2.166  0.30( 0.03) 0.10       1.5      12.00
      1        2.74   18.55    1.915  0.30( 0.03) 0.10       1.5      10.00
      2        3.85    9.32    2.841  0.30( 0.03) 0.10       1.5      17.00
      3        3.08   13.39    2.308  0.30( 0.03) 0.10       1.3      18.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        8.75    8.52    2.991  0.30( 0.03) 0.10       3.0      14.00
      2        9.06    9.32    2.841  0.30( 0.03) 0.10       3.3      17.00
      3        9.14   13.39    2.308  0.30( 0.03) 0.10       4.1      18.00
      4        8.81   14.96    2.166  0.30( 0.03) 0.10       4.2      12.00
      5        7.87   18.55    1.915  0.30( 0.03) 0.10       4.3      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       9.14    Tc(MIN.) =    13.39
  EFFECTIVE AREA(ACRES) =       4.09   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        4.3
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     16.00 =    1215.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     20.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   158.10  DOWNSTREAM(FEET) =   157.60
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
```

```
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.41
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.14
  PIPE TRAVEL TIME(MIN.) =   0.57    Tc(MIN.) =   13.96
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     20.00 =    1365.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     20.00 TO NODE     20.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.96
  RAINFALL INTENSITY(INCH/HR) =   2.25
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       4.09
  TOTAL STREAM AREA(ACRES) =       4.32
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       9.14

****************************************************************************
  FLOW PROCESS FROM NODE     21.00 TO NODE     22.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   260.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.00  DOWNSTREAM(FEET) =    165.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.819
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.758
  SUBAREA Tc 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        0.64      0.30      0.100    56    9.82
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      1.57
  TOTAL AREA(ACRES) =      0.64   PEAK FLOW RATE(CFS) =      1.57

****************************************************************************
  FLOW PROCESS FROM NODE     22.00 TO NODE     20.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   158.20  DOWNSTREAM(FEET) =   157.60
  FLOW LENGTH(FEET) =    20.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   4.2 INCHES
```

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.45
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.57
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    9.87
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     20.00 =     280.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     20.00 TO NODE     20.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.87
  RAINFALL INTENSITY(INCH/HR) =   2.75
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       0.64
  TOTAL STREAM AREA(ACRES) =       0.64
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.57

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        8.75    9.09    2.882  0.30( 0.03) 0.10       3.0      14.00
      1        9.06    9.89    2.747  0.30( 0.03) 0.10       3.3      17.00
      1        9.14   13.96    2.254  0.30( 0.03) 0.10       4.1      18.00
      1        8.81   15.53    2.120  0.30( 0.03) 0.10       4.2      12.00
      1        7.87   19.14    1.881  0.30( 0.03) 0.10       4.3      10.00
      2        1.57    9.87    2.749  0.30( 0.03) 0.10       0.6      21.00

  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       10.27    9.09    2.882  0.30( 0.03) 0.10       3.6      14.00
      2       10.62    9.87    2.749  0.30( 0.03) 0.10       3.9      21.00
      3       10.63    9.89    2.747  0.30( 0.03) 0.10       3.9      17.00
      4       10.42   13.96    2.254  0.30( 0.03) 0.10       4.7      18.00
      5       10.02   15.53    2.120  0.30( 0.03) 0.10       4.9      12.00
      6        8.94   19.14    1.881  0.30( 0.03) 0.10       5.0      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      10.63    Tc(MIN.) =     9.89
  EFFECTIVE AREA(ACRES) =       3.95   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        5.0
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     20.00 =    1365.00 FEET.

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

```
 FLOW PROCESS FROM NODE     20.00 TO NODE     23.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   157.60  DOWNSTREAM(FEET) =   156.40
 FLOW LENGTH(FEET) =   365.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.51
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      10.63
 PIPE TRAVEL TIME(MIN.) =   1.35    Tc(MIN.) =   11.24
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     23.00 =    1730.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     23.00 TO NODE     23.00 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.) =   11.24
 RAINFALL INTENSITY(INCH/HR) =   2.55
 AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       3.95
 TOTAL STREAM AREA(ACRES) =       4.96
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      10.63

****************************************************************************
 FLOW PROCESS FROM NODE     24.00 TO NODE     25.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   320.00
 ELEVATION DATA: UPSTREAM(FEET) =    166.00  DOWNSTREAM(FEET) =    165.50

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.122
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.568
 SUBAREA Tc 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        1.40      0.30      0.100    56   11.12
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =      3.20
 TOTAL AREA(ACRES) =      1.40   PEAK FLOW RATE(CFS) =      3.20

****************************************************************************
 FLOW PROCESS FROM NODE     25.00 TO NODE     26.00 IS CODE =  51
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    165.50  DOWNSTREAM(FEET) =    161.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =   330.00   CHANNEL SLOPE =  0.0133
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   0.020
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.343
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        3.87      0.30     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.85
  AVERAGE FLOW DEPTH(FEET) =   0.13   TRAVEL TIME(MIN.) =   1.93
  Tc(MIN.) =   13.05
  SUBAREA AREA(ACRES) =     3.87       SUBAREA RUNOFF(CFS) =    8.05
  EFFECTIVE AREA(ACRES) =      5.27     AREA-AVERAGED Fm(INCH/HR) =   0.03
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.10
  TOTAL AREA(ACRES) =        5.3         PEAK FLOW RATE(CFS) =      10.97

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.16   FLOW VELOCITY(FEET/SEC.) =   3.36
  LONGEST FLOWPATH FROM NODE     24.00 TO NODE     26.00 =     650.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     26.00 TO NODE     23.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   158.00  DOWNSTREAM(FEET) =   156.40
  FLOW LENGTH(FEET) =   315.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  14.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.41
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.97
  PIPE TRAVEL TIME(MIN.) =   0.97    Tc(MIN.) =   14.02
  LONGEST FLOWPATH FROM NODE     24.00 TO NODE     23.00 =     965.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     23.00 TO NODE     23.00 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.) =   14.02
  RAINFALL INTENSITY(INCH/HR) =   2.25
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
```

```
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       5.27
 TOTAL STREAM AREA(ACRES) =       5.27
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      10.97

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       10.27   10.45    2.661  0.30( 0.03) 0.10       3.6      14.00
     1       10.62   11.22    2.555  0.30( 0.03) 0.10       3.9      21.00
     1       10.63   11.24    2.552  0.30( 0.03) 0.10       3.9      17.00
     1       10.42   15.31    2.138  0.30( 0.03) 0.10       4.7      18.00
     1       10.02   16.90    2.020  0.30( 0.03) 0.10       4.9      12.00
     1        8.94   20.53    1.807  0.30( 0.03) 0.10       5.0      10.00
     2       10.97   14.02    2.248  0.30( 0.03) 0.10       5.3      24.00

 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       19.97   10.45    2.661  0.30( 0.03) 0.10       7.5      14.00
     2       20.61   11.22    2.555  0.30( 0.03) 0.10       8.2      21.00
     3       20.62   11.24    2.552  0.30( 0.03) 0.10       8.2      17.00
     4       21.46   14.02    2.248  0.30( 0.03) 0.10       9.7      24.00
     5       20.85   15.31    2.138  0.30( 0.03) 0.10      10.0      18.00
     6       19.86   16.90    2.020  0.30( 0.03) 0.10      10.1      12.00
     7       17.73   20.53    1.807  0.30( 0.03) 0.10      10.2      10.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      21.46    Tc(MIN.) =    14.02
 EFFECTIVE AREA(ACRES) =       9.75   AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =       10.2
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     23.00 =    1730.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     23.00 TO NODE     27.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   156.40  DOWNSTREAM(FEET) =   155.40
 FLOW LENGTH(FEET) =   235.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  30.0 INCH PIPE IS  20.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.93
 GIVEN PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      21.46
 PIPE TRAVEL TIME(MIN.) =   0.66    Tc(MIN.) =   14.68
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     27.00 =    1965.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     27.00 TO NODE     27.00 IS CODE =   1
```

```
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.68
  RAINFALL INTENSITY(INCH/HR) =   2.19
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       9.75
  TOTAL STREAM AREA(ACRES) =      10.23
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      21.46

****************************************************************************
  FLOW PROCESS FROM NODE     28.00 TO NODE     29.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   225.00
  ELEVATION DATA: UPSTREAM(FEET) =    170.00  DOWNSTREAM(FEET) =    166.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.101
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.622
  SUBAREA Tc 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        1.32      0.30     0.100    56    6.10
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      4.27
  TOTAL AREA(ACRES) =      1.32   PEAK FLOW RATE(CFS) =      4.27

****************************************************************************
  FLOW PROCESS FROM NODE     29.00 TO NODE     30.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    164.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.0077
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   1.500
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.262
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        2.72      0.30     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.23
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.08
```

```
  AVERAGE FLOW DEPTH(FEET) =   0.36   TRAVEL TIME(MIN.) =   1.22
  Tc(MIN.) =    7.32
  SUBAREA AREA(ACRES) =     2.72       SUBAREA RUNOFF(CFS) =    7.91
  EFFECTIVE AREA(ACRES) =      4.04     AREA-AVERAGED Fm(INCH/HR) =   0.03
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.10
  TOTAL AREA(ACRES) =        4.0         PEAK FLOW RATE(CFS) =      11.75

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.45   FLOW VELOCITY(FEET/SEC.) =   4.57
  LONGEST FLOWPATH FROM NODE     28.00 TO NODE     30.00 =     525.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE     30.00 IS CODE =  82
----------------------------------------------------------------------------
  >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
  >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.40  DOWNSTREAM(FEET) =    164.20

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.381
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.248
  SUBAREA Tc 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        2.23      0.30     0.100    56    7.38
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    2.23   INITIAL SUBAREA RUNOFF(CFS) =    6.46

  ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
  MAINLINE Tc(MIN.) =    7.32
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.262
  SUBAREA AREA(ACRES) =    2.23      SUBAREA RUNOFF(CFS) =    6.49
  EFFECTIVE AREA(ACRES) =      6.27   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        6.3       PEAK FLOW RATE(CFS) =      18.24

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE     27.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   158.00  DOWNSTREAM(FEET) =   155.40
  FLOW LENGTH(FEET) =   160.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  14.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.52
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      18.24
  PIPE TRAVEL TIME(MIN.) =   0.28    Tc(MIN.) =    7.60
  LONGEST FLOWPATH FROM NODE     28.00 TO NODE     27.00 =     685.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     27.00 TO NODE     27.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.60
  RAINFALL INTENSITY(INCH/HR) =   3.19
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       6.27
  TOTAL STREAM AREA(ACRES) =       6.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      18.24

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       19.97   11.12    2.568  0.30( 0.03) 0.10       7.5      14.00
      1       20.61   11.89    2.472  0.30( 0.03) 0.10       8.2      21.00
      1       20.62   11.90    2.470  0.30( 0.03) 0.10       8.2      17.00
      1       21.46   14.68    2.190  0.30( 0.03) 0.10       9.7      24.00
      1       20.85   15.98    2.086  0.30( 0.03) 0.10      10.0      18.00
      1       19.86   17.57    1.976  0.30( 0.03) 0.10      10.1      12.00
      1       17.73   21.22    1.773  0.30( 0.03) 0.10      10.2      10.00
      2       18.24    7.60    3.192  0.30( 0.03) 0.10       6.3      28.00

  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       35.25    7.60    3.192  0.30( 0.03) 0.10      11.4      28.00
      2       34.60   11.12    2.568  0.30( 0.03) 0.10      13.8      14.00
      3       34.69   11.89    2.472  0.30( 0.03) 0.10      14.4      21.00
      4       34.69   11.90    2.470  0.30( 0.03) 0.10      14.4      17.00
      5       33.91   14.68    2.190  0.30( 0.03) 0.10      16.0      24.00
      6       32.71   15.98    2.086  0.30( 0.03) 0.10      16.3      18.00
      7       31.08   17.57    1.976  0.30( 0.03) 0.10      16.4      12.00
      8       27.78   21.22    1.773  0.30( 0.03) 0.10      16.5      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      35.25    Tc(MIN.) =     7.60
  EFFECTIVE AREA(ACRES) =      11.43   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       16.5
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     27.00 =    1965.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     27.00 TO NODE     31.00 IS CODE =  41
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   155.40  DOWNSTREAM(FEET) =   155.00
  FLOW LENGTH(FEET) =   105.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  26.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.40
  GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      35.25
  PIPE TRAVEL TIME(MIN.) =   0.27    Tc(MIN.) =    7.88
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     31.00 =    2070.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     31.00 TO NODE     31.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     32.00 TO NODE     33.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.30  DOWNSTREAM(FEET) =    166.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.850
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.476
  SUBAREA Tc 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        2.62      0.30      0.100    56   11.85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      5.77
  TOTAL AREA(ACRES) =      2.62   PEAK FLOW RATE(CFS) =      5.77

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     34.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  166.00  DOWNSTREAM ELEVATION(FEET) =  165.60
  STREET LENGTH(FEET) =   485.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 25.00

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

  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) =       9.78
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.56
    HALFSTREET FLOOD WIDTH(FEET) =   24.36
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.01
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.56
  STREET FLOW TRAVEL TIME(MIN.) =   7.99   Tc(MIN.) =   19.84
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.843
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        4.89      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) =    4.89      SUBAREA RUNOFF(CFS) =    7.98
  EFFECTIVE AREA(ACRES) =      7.51    AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        7.5        PEAK FLOW RATE(CFS) =      12.25

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.60   HALFSTREET FLOOD WIDTH(FEET) =  28.27
  FLOW VELOCITY(FEET/SEC.) =  1.05   DEPTH*VELOCITY(FT*FT/SEC.) =   0.62
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  485.0 FT WITH ELEVATION-DROP =   0.4 FT, IS    9.4 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE     34.00
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     34.00 =     785.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     34.00 TO NODE     35.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    165.60  DOWNSTREAM(FEET) =    165.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =   180.00   CHANNEL SLOPE =  0.0011
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   0.020
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      12.25
  FLOW VELOCITY(FEET/SEC.) =   2.57   FLOW DEPTH(FEET) =   0.95
  TRAVEL TIME(MIN.) =   1.17   Tc(MIN.) =   21.00
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     35.00 =     965.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     35.00 TO NODE     35.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   21.00
```

```
  RAINFALL INTENSITY(INCH/HR) =   1.78
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       7.51
  TOTAL STREAM AREA(ACRES) =       7.51
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      12.25

****************************************************************************
  FLOW PROCESS FROM NODE     35.00 TO NODE     35.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   665.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.20  DOWNSTREAM(FEET) =    165.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.351
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.312
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        6.31      0.30      0.100    56   13.35
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     12.96
  TOTAL AREA(ACRES) =      6.31   PEAK FLOW RATE(CFS) =     12.96

****************************************************************************
  FLOW PROCESS FROM NODE     35.00 TO NODE     35.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.35
  RAINFALL INTENSITY(INCH/HR) =   2.31
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       6.31
  TOTAL STREAM AREA(ACRES) =       6.31
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      12.96

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       12.25   21.00    1.784  0.30( 0.03) 0.10       7.5      32.00
      2       12.96   13.35    2.312  0.30( 0.03) 0.10       6.3      35.00

  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       23.10   13.35    2.312  0.30( 0.03) 0.10      11.1      35.00
      2       22.21   21.00    1.784  0.30( 0.03) 0.10      13.8      32.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      23.10    Tc(MIN.) =    13.35
  EFFECTIVE AREA(ACRES) =      11.08   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       13.8
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     35.00 =     965.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     35.00 TO NODE     31.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   159.00  DOWNSTREAM(FEET) =   155.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.19
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      23.10
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =   13.40
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     31.00 =    1015.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     31.00 TO NODE     31.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       23.10   13.40    2.308  0.30( 0.03) 0.10      11.1      35.00
      2       22.21   21.05    1.781  0.30( 0.03) 0.10      13.8      32.00
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     31.00 =    1015.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       35.25    7.88    3.128  0.30( 0.03) 0.10      11.4      28.00
      2       34.60   11.39    2.532  0.30( 0.03) 0.10      13.8      14.00
      3       34.69   12.16    2.440  0.30( 0.03) 0.10      14.4      21.00
      4       34.69   12.18    2.438  0.30( 0.03) 0.10      14.4      17.00
      5       33.91   14.96    2.167  0.30( 0.03) 0.10      16.0      24.00
      6       32.71   16.25    2.066  0.30( 0.03) 0.10      16.3      18.00
      7       31.08   17.85    1.958  0.30( 0.03) 0.10      16.4      12.00
      8       27.78   21.50    1.760  0.30( 0.03) 0.10      16.5      10.00
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     31.00 =    2070.00 FEET.
```

```
 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       53.73    7.88    3.128  0.30( 0.03) 0.10      17.9      28.00
     2       56.18   11.39    2.532  0.30( 0.03) 0.10      23.2      14.00
     3       56.87   12.16    2.440  0.30( 0.03) 0.10      24.5      21.00
     4       56.88   12.18    2.438  0.30( 0.03) 0.10      24.5      17.00
     5       57.45   13.40    2.308  0.30( 0.03) 0.10      26.2      35.00
     6       56.83   14.96    2.167  0.30( 0.03) 0.10      27.7      24.00
     7       55.47   16.25    2.066  0.30( 0.03) 0.10      28.4      18.00
     8       53.67   17.85    1.958  0.30( 0.03) 0.10      29.1      12.00
     9       50.40   21.05    1.781  0.30( 0.03) 0.10      30.3      32.00
    10       49.72   21.50    1.760  0.30( 0.03) 0.10      30.3      10.00
   TOTAL AREA(ACRES) =        30.3

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       57.45  Tc(MIN.) =   13.397
 EFFECTIVE AREA(ACRES) =     26.22  AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =       30.3
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     31.00 =    2070.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     31.00 TO NODE     36.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   155.00  DOWNSTREAM(FEET) =   153.80
 FLOW LENGTH(FEET) =   265.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  42.0 INCH PIPE IS  30.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.73
 GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      57.45
 PIPE TRAVEL TIME(MIN.) =   0.57    Tc(MIN.) =   13.97
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     36.00 =    2335.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     36.00 TO NODE     36.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   13.97
 RAINFALL INTENSITY(INCH/HR) =   2.25
 AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =      26.22
 TOTAL STREAM AREA(ACRES) =      30.32
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      57.45
```

```
****************************************************************************
 FLOW PROCESS FROM NODE     37.00 TO NODE     38.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   325.00
 ELEVATION DATA: UPSTREAM(FEET) =    169.50  DOWNSTREAM(FEET) =    168.00

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.011
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.897
 SUBAREA Tc 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        1.65      0.30     0.100    56    9.01
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =      4.26
 TOTAL AREA(ACRES) =      1.65   PEAK FLOW RATE(CFS) =      4.26

****************************************************************************
 FLOW PROCESS FROM NODE     38.00 TO NODE     36.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   159.00  DOWNSTREAM(FEET) =   153.80
 FLOW LENGTH(FEET) =    70.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  11.42
 GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       4.26
 PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =    9.11
 LONGEST FLOWPATH FROM NODE     37.00 TO NODE     36.00 =     395.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     36.00 TO NODE     36.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.11
 RAINFALL INTENSITY(INCH/HR) =   2.88
 AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       1.65
 TOTAL STREAM AREA(ACRES) =       1.65
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       4.26

 ** CONFLUENCE DATA **
```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	53.73	8.46	3.004	0.30(0.03)	0.10	17.9	28.00
1	56.18	11.97	2.462	0.30(0.03)	0.10	23.2	14.00
1	56.87	12.73	2.376	0.30(0.03)	0.10	24.5	21.00
1	56.88	12.75	2.374	0.30(0.03)	0.10	24.5	17.00
1	57.45	13.97	2.253	0.30(0.03)	0.10	26.2	35.00
1	56.83	15.53	2.120	0.30(0.03)	0.10	27.7	24.00
1	55.47	16.83	2.025	0.30(0.03)	0.10	28.4	18.00
1	53.67	18.42	1.923	0.30(0.03)	0.10	29.1	12.00
1	50.40	21.63	1.754	0.30(0.03)	0.10	30.3	32.00
1	49.72	22.09	1.733	0.30(0.03)	0.10	30.3	10.00
2	4.26	9.11	2.878	0.30(0.03)	0.10	1.6	37.00

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	57.86	8.46	3.004	0.30(0.03)	0.10	19.5	28.00
2	58.45	9.11	2.878	0.30(0.03)	0.10	20.6	37.00
3	59.82	11.97	2.462	0.30(0.03)	0.10	24.9	14.00
4	60.38	12.73	2.376	0.30(0.03)	0.10	26.1	21.00
5	60.39	12.75	2.374	0.30(0.03)	0.10	26.2	17.00
6	60.77	13.97	2.253	0.30(0.03)	0.10	27.9	35.00
7	59.95	15.53	2.120	0.30(0.03)	0.10	29.3	24.00
8	58.46	16.83	2.025	0.30(0.03)	0.10	30.0	18.00
9	56.50	18.42	1.923	0.30(0.03)	0.10	30.7	12.00
10	52.98	21.63	1.754	0.30(0.03)	0.10	32.0	32.00
11	52.26	22.09	1.733	0.30(0.03)	0.10	32.0	10.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 60.77 Tc(MIN.) = 13.97
EFFECTIVE AREA(ACRES) = 27.87 AREA-AVERAGED Fm(INCH/HR) = 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 32.0
LONGEST FLOWPATH FROM NODE 10.00 TO NODE 36.00 = 2335.00 FEET.

****
FLOW PROCESS FROM NODE 36.00 TO NODE 39.00 IS CODE = 41

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 153.80 DOWNSTREAM(FEET) = 152.80
FLOW LENGTH(FEET) = 230.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 42.0 INCH PIPE IS 32.4 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 7.64
GIVEN PIPE DIAMETER(INCH) = 42.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 60.77
PIPE TRAVEL TIME(MIN.) = 0.50 Tc(MIN.) = 14.47
LONGEST FLOWPATH FROM NODE 10.00 TO NODE 39.00 = 2565.00 FEET.

```
****************************************************************************
 FLOW PROCESS FROM NODE     39.00 TO NODE     39.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   14.47
 RAINFALL INTENSITY(INCH/HR) =   2.21
 AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =      27.87
 TOTAL STREAM AREA(ACRES) =      31.97
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      60.77

****************************************************************************
 FLOW PROCESS FROM NODE     40.00 TO NODE     39.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   320.00
 ELEVATION DATA: UPSTREAM(FEET) =    167.40  DOWNSTREAM(FEET) =    167.20

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.359
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.312
 SUBAREA Tc 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        0.48      0.30      0.100    56   13.36
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =      0.99
 TOTAL AREA(ACRES) =      0.48   PEAK FLOW RATE(CFS) =      0.99

****************************************************************************
 FLOW PROCESS FROM NODE     39.00 TO NODE     39.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   13.36
 RAINFALL INTENSITY(INCH/HR) =   2.31
 AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       0.48
 TOTAL STREAM AREA(ACRES) =       0.48
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.99
```

```
 ** CONFLUENCE DATA **
  STREAM       Q      Tc    Intensity   Fp(Fm)     Ap      Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       57.86    8.96    2.906  0.30( 0.03) 0.10      19.5      28.00
     1       58.45    9.62    2.791  0.30( 0.03) 0.10      20.6      37.00
     1       59.82   12.47    2.405  0.30( 0.03) 0.10      24.9      14.00
     1       60.38   13.23    2.324  0.30( 0.03) 0.10      26.1      21.00
     1       60.39   13.25    2.322  0.30( 0.03) 0.10      26.2      17.00
     1       60.77   14.47    2.208  0.30( 0.03) 0.10      27.9      35.00
     1       59.95   16.03    2.082  0.30( 0.03) 0.10      29.3      24.00
     1       58.46   17.33    1.991  0.30( 0.03) 0.10      30.0      18.00
     1       56.50   18.93    1.893  0.30( 0.03) 0.10      30.7      12.00
     1       52.98   22.15    1.730  0.30( 0.03) 0.10      32.0      32.00
     1       52.26   22.60    1.710  0.30( 0.03) 0.10      32.0      10.00
     2        0.99   13.36    2.312  0.30( 0.03) 0.10       0.5      40.00

 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       58.69    8.96    2.906  0.30( 0.03) 0.10      19.8      28.00
     2       59.31    9.62    2.791  0.30( 0.03) 0.10      20.9      37.00
     3       60.78   12.47    2.405  0.30( 0.03) 0.10      25.3      14.00
     4       61.36   13.23    2.324  0.30( 0.03) 0.10      26.6      21.00
     5       61.37   13.25    2.322  0.30( 0.03) 0.10      26.6      17.00
     6       61.41   13.36    2.312  0.30( 0.03) 0.10      26.8      40.00
     7       61.71   14.47    2.208  0.30( 0.03) 0.10      28.3      35.00
     8       60.84   16.03    2.082  0.30( 0.03) 0.10      29.8      24.00
     9       59.30   17.33    1.991  0.30( 0.03) 0.10      30.5      18.00
    10       57.30   18.93    1.893  0.30( 0.03) 0.10      31.2      12.00
    11       53.71   22.15    1.730  0.30( 0.03) 0.10      32.4      32.00
    12       52.99   22.60    1.710  0.30( 0.03) 0.10      32.5      10.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      61.71    Tc(MIN.) =    14.47
 EFFECTIVE AREA(ACRES) =      28.35   AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =       32.5
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     39.00 =    2565.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     39.00 TO NODE     41.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   152.80  DOWNSTREAM(FEET) =   152.00
 FLOW LENGTH(FEET) =   210.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  48.0 INCH PIPE IS  30.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.47
 GIVEN PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      61.71
```

```
  PIPE TRAVEL TIME(MIN.) =   0.47    Tc(MIN.) =   14.94
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     41.00 =    2775.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     41.00 TO NODE     41.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.94
  RAINFALL INTENSITY(INCH/HR) =   2.17
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =      28.35
  TOTAL STREAM AREA(ACRES) =      32.45
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      61.71

****************************************************************************
  FLOW PROCESS FROM NODE     42.00 TO NODE     41.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   230.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.00  DOWNSTREAM(FEET) =    163.20

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.464
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.504
  SUBAREA Tc 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        0.66      0.30     0.100    56    6.46
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      2.06
  TOTAL AREA(ACRES) =      0.66   PEAK FLOW RATE(CFS) =      2.06

****************************************************************************
  FLOW PROCESS FROM NODE     41.00 TO NODE     41.00 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.) =    6.46
  RAINFALL INTENSITY(INCH/HR) =   3.50
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       0.66
```

TOTAL STREAM AREA(ACRES) = 0.66
PEAK FLOW RATE(CFS) AT CONFLUENCE = 2.06

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	58.69	9.43	2.822	0.30(0.03)	0.10	19.8	28.00
1	59.31	10.09	2.715	0.30(0.03)	0.10	20.9	37.00
1	60.78	12.94	2.354	0.30(0.03)	0.10	25.3	14.00
1	61.36	13.70	2.278	0.30(0.03)	0.10	26.6	21.00
1	61.37	13.72	2.277	0.30(0.03)	0.10	26.6	17.00
1	61.41	13.83	2.266	0.30(0.03)	0.10	26.8	40.00
1	61.71	14.94	2.168	0.30(0.03)	0.10	28.3	35.00
1	60.84	16.50	2.048	0.30(0.03)	0.10	29.8	24.00
1	59.30	17.80	1.961	0.30(0.03)	0.10	30.5	18.00
1	57.30	19.41	1.866	0.30(0.03)	0.10	31.2	12.00
1	53.71	22.63	1.709	0.30(0.03)	0.10	32.4	32.00
1	52.99	23.09	1.690	0.30(0.03)	0.10	32.5	10.00
2	2.06	6.46	3.504	0.30(0.03)	0.10	0.7	42.00

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	52.11	6.46	3.504	0.30(0.03)	0.10	14.2	42.00
2	60.35	9.43	2.822	0.30(0.03)	0.10	20.5	28.00
3	60.90	10.09	2.715	0.30(0.03)	0.10	21.6	37.00
4	62.16	12.94	2.354	0.30(0.03)	0.10	26.0	14.00
5	62.69	13.70	2.278	0.30(0.03)	0.10	27.3	21.00
6	62.70	13.72	2.277	0.30(0.03)	0.10	27.3	17.00
7	62.73	13.83	2.266	0.30(0.03)	0.10	27.5	40.00
8	62.98	14.94	2.168	0.30(0.03)	0.10	29.0	35.00
9	62.04	16.50	2.048	0.30(0.03)	0.10	30.5	24.00
10	60.45	17.80	1.961	0.30(0.03)	0.10	31.2	18.00
11	58.39	19.41	1.866	0.30(0.03)	0.10	31.9	12.00
12	54.71	22.63	1.709	0.30(0.03)	0.10	33.1	32.00
13	53.97	23.09	1.690	0.30(0.03)	0.10	33.1	10.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 62.98 Tc(MIN.) = 14.94
EFFECTIVE AREA(ACRES) = 29.01 AREA-AVERAGED Fm(INCH/HR) = 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 33.1
LONGEST FLOWPATH FROM NODE 10.00 TO NODE 41.00 = 2775.00 FEET.

****
FLOW PROCESS FROM NODE 41.00 TO NODE 43.00 IS CODE = 41

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 152.00 DOWNSTREAM(FEET) = 151.80

```
  FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  25.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.32
  GIVEN PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      62.98
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =   14.99
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     43.00 =    2805.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     43.00 TO NODE     43.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     44.00 TO NODE     45.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   350.00
  ELEVATION DATA: UPSTREAM(FEET) =    164.00  DOWNSTREAM(FEET) =    162.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.894
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.918
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        1.55      0.30      0.100    56    8.89
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      4.03
  TOTAL AREA(ACRES) =      1.55   PEAK FLOW RATE(CFS) =      4.03

****************************************************************************
  FLOW PROCESS FROM NODE     45.00 TO NODE     46.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    162.00  DOWNSTREAM(FEET) =    161.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =   165.00   CHANNEL SLOPE =  0.0012
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   0.040
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
  CHANNEL FLOW THRU SUBAREA(CFS) =       4.03
  FLOW VELOCITY(FEET/SEC.) =   2.04   FLOW DEPTH(FEET) =   0.65
  TRAVEL TIME(MIN.) =   1.35   Tc(MIN.) =   10.24
  LONGEST FLOWPATH FROM NODE     44.00 TO NODE     46.00 =     515.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     46.00 TO NODE     46.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```

```
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.24
  RAINFALL INTENSITY(INCH/HR) =   2.69
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       1.55
  TOTAL STREAM AREA(ACRES) =       1.55
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       4.03

****************************************************************************
  FLOW PROCESS FROM NODE     47.00 TO NODE     46.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   285.00
  ELEVATION DATA: UPSTREAM(FEET) =    165.00  DOWNSTREAM(FEET) =    161.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.157
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.305
  SUBAREA Tc 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        1.23      0.30      0.100    56    7.16
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      3.63
  TOTAL AREA(ACRES) =      1.23   PEAK FLOW RATE(CFS) =      3.63

****************************************************************************
  FLOW PROCESS FROM NODE     46.00 TO NODE     46.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.16
  RAINFALL INTENSITY(INCH/HR) =   3.31
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       1.23
  TOTAL STREAM AREA(ACRES) =       1.23
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       3.63

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        4.03   10.24    2.692  0.30( 0.03) 0.10       1.5      44.00
```

```
    2        3.63    7.16    3.305  0.30( 0.03) 0.10       1.2      47.00

  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        7.09    7.16    3.305  0.30( 0.03) 0.10       2.3      47.00
      2        6.98   10.24    2.692  0.30( 0.03) 0.10       2.8      44.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       7.09    Tc(MIN.) =     7.16
  EFFECTIVE AREA(ACRES) =       2.31   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        2.8
  LONGEST FLOWPATH FROM NODE     44.00 TO NODE     46.00 =     515.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     46.00 TO NODE     43.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   157.00  DOWNSTREAM(FEET) =   151.80
  FLOW LENGTH(FEET) =   115.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.01
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.09
  PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =    7.33
  LONGEST FLOWPATH FROM NODE     44.00 TO NODE     43.00 =     630.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     43.00 TO NODE     43.00 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        7.09    7.33    3.260  0.30( 0.03) 0.10       2.3      47.00
      2        6.98   10.41    2.666  0.30( 0.03) 0.10       2.8      44.00
  LONGEST FLOWPATH FROM NODE     44.00 TO NODE     43.00 =     630.00 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       52.11    6.52    3.487  0.30( 0.03) 0.10      14.2      42.00
      2       60.35    9.49    2.812  0.30( 0.03) 0.10      20.5      28.00
      3       60.90   10.14    2.707  0.30( 0.03) 0.10      21.6      37.00
      4       62.16   12.99    2.349  0.30( 0.03) 0.10      26.0      14.00
      5       62.69   13.76    2.273  0.30( 0.03) 0.10      27.3      21.00
```

6	62.70	13.77	2.272	0.30(0.03)	0.10	27.3	17.00
7	62.73	13.88	2.261	0.30(0.03)	0.10	27.5	40.00
8	62.98	14.99	2.164	0.30(0.03)	0.10	29.0	35.00
9	62.04	16.56	2.044	0.30(0.03)	0.10	30.5	24.00
10	60.45	17.86	1.957	0.30(0.03)	0.10	31.2	18.00
11	58.39	19.46	1.863	0.30(0.03)	0.10	31.9	12.00
12	54.71	22.68	1.707	0.30(0.03)	0.10	33.1	32.00
13	53.97	23.14	1.687	0.30(0.03)	0.10	33.1	10.00

LONGEST FLOWPATH FROM NODE 10.00 TO NODE 43.00 = 2805.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	58.86	6.52	3.487	0.30(0.03)	0.10	16.3	42.00
2	61.45	7.33	3.260	0.30(0.03)	0.10	18.2	47.00
3	67.36	9.49	2.812	0.30(0.03)	0.10	23.1	28.00
4	67.89	10.14	2.707	0.30(0.03)	0.10	24.3	37.00
5	68.00	10.41	2.666	0.30(0.03)	0.10	24.8	44.00
6	68.29	12.99	2.349	0.30(0.03)	0.10	28.8	14.00
7	68.63	13.76	2.273	0.30(0.03)	0.10	30.1	21.00
8	68.64	13.77	2.272	0.30(0.03)	0.10	30.1	17.00
9	68.64	13.88	2.261	0.30(0.03)	0.10	30.2	40.00
10	68.63	14.99	2.164	0.30(0.03)	0.10	31.8	35.00
11	67.37	16.56	2.044	0.30(0.03)	0.10	33.2	24.00
12	65.55	17.86	1.957	0.30(0.03)	0.10	33.9	18.00
13	63.24	19.46	1.863	0.30(0.03)	0.10	34.7	12.00
14	59.15	22.68	1.707	0.30(0.03)	0.10	35.9	32.00
15	58.36	23.14	1.687	0.30(0.03)	0.10	35.9	10.00

TOTAL AREA(ACRES) = 35.9

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 68.64 Tc(MIN.) = 13.881
EFFECTIVE AREA(ACRES) = 30.24 AREA-AVERAGED Fm(INCH/HR) = 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 35.9
LONGEST FLOWPATH FROM NODE 10.00 TO NODE 43.00 = 2805.00 FEET.

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 35.9 TC(MIN.) = 13.88
EFFECTIVE AREA(ACRES) = 30.24 AREA-AVERAGED Fm(INCH/HR)= 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.100
PEAK FLOW RATE(CFS) = 68.64

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	58.86	6.52	3.487	0.30(0.03)	0.10	16.3	42.00
2	61.45	7.33	3.260	0.30(0.03)	0.10	18.2	47.00
3	67.36	9.49	2.812	0.30(0.03)	0.10	23.1	28.00
4	67.89	10.14	2.707	0.30(0.03)	0.10	24.3	37.00
5	68.00	10.41	2.666	0.30(0.03)	0.10	24.8	44.00
6	68.29	12.99	2.349	0.30(0.03)	0.10	28.8	14.00
7	68.63	13.76	2.273	0.30(0.03)	0.10	30.1	21.00
8	68.64	13.77	2.272	0.30(0.03)	0.10	30.1	17.00

9	68.64	13.88	2.261	0.30(0.03)	0.10	30.2	40.00
10	68.63	14.99	2.164	0.30(0.03)	0.10	31.8	35.00
11	67.37	16.56	2.044	0.30(0.03)	0.10	33.2	24.00
12	65.55	17.86	1.957	0.30(0.03)	0.10	33.9	18.00
13	63.24	19.46	1.863	0.30(0.03)	0.10	34.7	12.00
14	59.15	22.68	1.707	0.30(0.03)	0.10	35.9	32.00
15	58.36	23.14	1.687	0.30(0.03)	0.10	35.9	10.00

END OF RATIONAL METHOD ANALYSIS

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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            Ver. 20.0  Release Date: 06/01/2013  License ID 1654

                          Analysis prepared by:

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                            Irvine, CA 92606
                              949-474-1960
```

```
 ************************** DESCRIPTION OF STUDY **************************
* FREEMAN                                                                 *
* EXISTING CONDITION                                                      *
* 25 YEAR ANALYSIS                                                        *
 *************************************************************************

  FILE NAME: FREX25.DAT
  TIME/DATE OF STUDY: 09:33 05/27/2017
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   24.0     19.0    0.020/0.020/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.67 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

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

```
 FLOW PROCESS FROM NODE     10.00 TO NODE     32.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   265.00
 ELEVATION DATA: UPSTREAM(FEET) =    167.50  DOWNSTREAM(FEET) =    166.30

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.337
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.612
 SUBAREA Tc 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        0.15      0.30     0.100    56    8.34
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =      0.48
 TOTAL AREA(ACRES) =      0.15   PEAK FLOW RATE(CFS) =      0.48

****************************************************************************
 FLOW PROCESS FROM NODE     32.00 TO NODE     11.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  166.30  DOWNSTREAM ELEVATION(FEET) =  165.10
 STREET LENGTH(FEET) =   210.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 25.00

 DISTANCE FROM CROWN 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) =       0.65
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.25
   HALFSTREET FLOOD WIDTH(FEET) =    6.01
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.36
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.33
 STREET FLOW TRAVEL TIME(MIN.) =   2.58   Tc(MIN.) =   10.92
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.100
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B        0.12      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) =    0.12      SUBAREA RUNOFF(CFS) =    0.33
```

```
  EFFECTIVE AREA(ACRES) =      0.27    AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        0.3        PEAK FLOW RATE(CFS) =       0.75

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.26   HALFSTREET FLOOD WIDTH(FEET) =   6.48
  FLOW VELOCITY(FEET/SEC.) =  1.39   DEPTH*VELOCITY(FT*FT/SEC.) =   0.35
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     11.00 =     475.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     11.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.92
  RAINFALL INTENSITY(INCH/HR) =   3.10
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       0.27
  TOTAL STREAM AREA(ACRES) =       0.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.75

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE     11.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   210.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.00  DOWNSTREAM(FEET) =    165.10

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.680
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.783
  SUBAREA Tc 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        0.76      0.30      0.100    56    7.68
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      2.57
  TOTAL AREA(ACRES) =      0.76   PEAK FLOW RATE(CFS) =      2.57

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     11.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
```

```
  TIME OF CONCENTRATION(MIN.) =    7.68
  RAINFALL INTENSITY(INCH/HR) =   3.78
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       0.76
  TOTAL STREAM AREA(ACRES) =       0.76
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.57

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        0.75   10.92    3.100  0.30( 0.03) 0.10       0.3      10.00
      2        2.57    7.68    3.783  0.30( 0.03) 0.10       0.8      12.00

  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        3.21    7.68    3.783  0.30( 0.03) 0.10       0.9      12.00
      2        2.85   10.92    3.100  0.30( 0.03) 0.10       1.0      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       3.21    Tc(MIN.) =     7.68
  EFFECTIVE AREA(ACRES) =       0.95   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        1.0
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     11.00 =     475.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     13.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  165.10  DOWNSTREAM ELEVATION(FEET) =  164.20
  STREET LENGTH(FEET) =   455.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 24.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  19.00
  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) =       3.65
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.48
    HALFSTREET FLOOD WIDTH(FEET) =   15.95
```

```
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.34
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.64
  STREET FLOW TRAVEL TIME(MIN.) =   5.67   Tc(MIN.) =   13.35
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.767
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        0.36      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) =    0.36      SUBAREA RUNOFF(CFS) =    0.89
  EFFECTIVE AREA(ACRES) =      1.31    AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        1.4        PEAK FLOW RATE(CFS) =       3.23

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.46   HALFSTREET FLOOD WIDTH(FEET) =  15.21
  FLOW VELOCITY(FEET/SEC.) =  1.29   DEPTH*VELOCITY(FT*FT/SEC.) =   0.60
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     13.00 =     930.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.35
  RAINFALL INTENSITY(INCH/HR) =   2.77
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       1.31
  TOTAL STREAM AREA(ACRES) =       1.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       3.23

****************************************************************************
  FLOW PROCESS FROM NODE     14.00 TO NODE     15.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   125.00
  ELEVATION DATA: UPSTREAM(FEET) =    164.60  DOWNSTREAM(FEET) =    164.20

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.616
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.117
  SUBAREA Tc 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        0.15      0.30     0.100    56    6.62
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
```

```
  SUBAREA RUNOFF(CFS) =      0.55
  TOTAL AREA(ACRES) =      0.15   PEAK FLOW RATE(CFS) =      0.55

****************************************************************************
  FLOW PROCESS FROM NODE     15.00 TO NODE     13.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   159.30  DOWNSTREAM(FEET) =   159.20
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.76
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.55
  PIPE TRAVEL TIME(MIN.) =   0.47    Tc(MIN.) =    7.09
  LONGEST FLOWPATH FROM NODE     14.00 TO NODE     13.00 =     175.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.09
  RAINFALL INTENSITY(INCH/HR) =   3.96
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       0.15
  TOTAL STREAM AREA(ACRES) =       0.15
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.55

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        3.23   13.35    2.767  0.30( 0.03) 0.10       1.3      12.00
      1        3.00   16.78    2.431  0.30( 0.03) 0.10       1.4      10.00
      2        0.55    7.09    3.959  0.30( 0.03) 0.10       0.2      14.00

  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        3.01    7.09    3.959  0.30( 0.03) 0.10       0.8      14.00
      2        3.61   13.35    2.767  0.30( 0.03) 0.10       1.5      12.00
      3        3.34   16.78    2.431  0.30( 0.03) 0.10       1.5      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       3.61    Tc(MIN.) =    13.35
```

```
  EFFECTIVE AREA(ACRES) =       1.46   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        1.5
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     13.00 =     930.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     16.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   159.20  DOWNSTREAM(FEET) =   158.10
  FLOW LENGTH(FEET) =   285.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.71
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.61
  PIPE TRAVEL TIME(MIN.) =   1.28    Tc(MIN.) =   14.63
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     16.00 =    1215.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 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.) =   14.63
  RAINFALL INTENSITY(INCH/HR) =   2.63
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       1.46
  TOTAL STREAM AREA(ACRES) =       1.54
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       3.61

****************************************************************************
  FLOW PROCESS FROM NODE     17.00 TO NODE     16.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   310.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.00  DOWNSTREAM(FEET) =    164.90

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.320
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.391
  SUBAREA Tc 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        1.52      0.30     0.100    56    9.32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
```

```
  SUBAREA RUNOFF(CFS) =      4.60
  TOTAL AREA(ACRES) =      1.52   PEAK FLOW RATE(CFS) =      4.60

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 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.) =    9.32
  RAINFALL INTENSITY(INCH/HR) =   3.39
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       1.52
  TOTAL STREAM AREA(ACRES) =       1.52
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       4.60

****************************************************************************
  FLOW PROCESS FROM NODE     18.00 TO NODE     19.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   320.00
  ELEVATION DATA: UPSTREAM(FEET) =    165.90  DOWNSTREAM(FEET) =    165.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.888
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.279
  SUBAREA Tc 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        1.26      0.30     0.100    56    9.89
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      3.68
  TOTAL AREA(ACRES) =      1.26   PEAK FLOW RATE(CFS) =      3.68

****************************************************************************
  FLOW PROCESS FROM NODE     19.00 TO NODE     16.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    165.00  DOWNSTREAM(FEET) =    164.90
  CHANNEL LENGTH THRU SUBAREA(FEET) =   265.00   CHANNEL SLOPE =  0.0004
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   0.040
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
  CHANNEL FLOW THRU SUBAREA(CFS) =       3.68
  FLOW VELOCITY(FEET/SEC.) =   1.33   FLOW DEPTH(FEET) =   0.91
  TRAVEL TIME(MIN.) =   3.32   Tc(MIN.) =   13.21
  LONGEST FLOWPATH FROM NODE     18.00 TO NODE     16.00 =     585.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 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.) =   13.21
  RAINFALL INTENSITY(INCH/HR) =   2.78
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       1.26
  TOTAL STREAM AREA(ACRES) =       1.26
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       3.68

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        3.01    8.43    3.590  0.30( 0.03) 0.10       0.8      14.00
      1        3.61   14.63    2.627  0.30( 0.03) 0.10       1.5      12.00
      1        3.34   18.09    2.330  0.30( 0.03) 0.10       1.5      10.00
      2        4.60    9.32    3.391  0.30( 0.03) 0.10       1.5      17.00
      3        3.68   13.21    2.783  0.30( 0.03) 0.10       1.3      18.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       10.45    8.43    3.590  0.30( 0.03) 0.10       3.0      14.00
      2       10.87    9.32    3.391  0.30( 0.03) 0.10       3.3      17.00
      3       10.99   13.21    2.783  0.30( 0.03) 0.10       4.1      18.00
      4       10.64   14.63    2.627  0.30( 0.03) 0.10       4.2      12.00
      5        9.56   18.09    2.330  0.30( 0.03) 0.10       4.3      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      10.99    Tc(MIN.) =    13.21
  EFFECTIVE AREA(ACRES) =       4.10   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        4.3
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     16.00 =    1215.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     20.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   158.10  DOWNSTREAM(FEET) =   157.60
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
```

```
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  17.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.56
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.99
  PIPE TRAVEL TIME(MIN.) =   0.55    Tc(MIN.) =   13.76
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     20.00 =    1365.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     20.00 TO NODE     20.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.76
  RAINFALL INTENSITY(INCH/HR) =   2.72
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       4.10
  TOTAL STREAM AREA(ACRES) =       4.32
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      10.99

****************************************************************************
  FLOW PROCESS FROM NODE     21.00 TO NODE     22.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   260.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.00  DOWNSTREAM(FEET) =    165.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.819
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.292
  SUBAREA Tc 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        0.64      0.30      0.100    56    9.82
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      1.88
  TOTAL AREA(ACRES) =      0.64   PEAK FLOW RATE(CFS) =      1.88

****************************************************************************
  FLOW PROCESS FROM NODE     22.00 TO NODE     20.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   158.20  DOWNSTREAM(FEET) =   157.60
  FLOW LENGTH(FEET) =    20.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   4.6 INCHES
```

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.78
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.88
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    9.87
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     20.00 =     280.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     20.00 TO NODE     20.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.87
  RAINFALL INTENSITY(INCH/HR) =   3.28
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       0.64
  TOTAL STREAM AREA(ACRES) =       0.64
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.88

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       10.45    8.98    3.463  0.30( 0.03) 0.10       3.0      14.00
      1       10.87    9.87    3.283  0.30( 0.03) 0.10       3.3      17.00
      1       10.99   13.76    2.720  0.30( 0.03) 0.10       4.1      18.00
      1       10.64   15.18    2.573  0.30( 0.03) 0.10       4.2      12.00
      1        9.56   18.65    2.290  0.30( 0.03) 0.10       4.3      10.00
      2        1.88    9.87    3.283  0.30( 0.03) 0.10       0.6      21.00

  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       12.26    8.98    3.463  0.30( 0.03) 0.10       3.6      14.00
      2       12.75    9.87    3.283  0.30( 0.03) 0.10       4.0      21.00
      3       12.75    9.87    3.283  0.30( 0.03) 0.10       4.0      17.00
      4       12.54   13.76    2.720  0.30( 0.03) 0.10       4.7      18.00
      5       12.11   15.18    2.573  0.30( 0.03) 0.10       4.9      12.00
      6       10.87   18.65    2.290  0.30( 0.03) 0.10       5.0      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      12.75    Tc(MIN.) =     9.87
  EFFECTIVE AREA(ACRES) =       3.98   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        5.0
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     20.00 =    1365.00 FEET.

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

```
 FLOW PROCESS FROM NODE     20.00 TO NODE     23.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   157.60  DOWNSTREAM(FEET) =   156.40
 FLOW LENGTH(FEET) =   365.00   MANNING'S N =  0.013
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.06
 PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      12.75
 PIPE TRAVEL TIME(MIN.) =   1.50    Tc(MIN.) =   11.37
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     23.00 =    1730.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     23.00 TO NODE     23.00 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.) =   11.37
 RAINFALL INTENSITY(INCH/HR) =   3.03
 AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       3.98
 TOTAL STREAM AREA(ACRES) =       4.96
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      12.75

****************************************************************************
 FLOW PROCESS FROM NODE     24.00 TO NODE     25.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   320.00
 ELEVATION DATA: UPSTREAM(FEET) =    166.00  DOWNSTREAM(FEET) =    165.50

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.122
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.068
 SUBAREA Tc 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        1.40      0.30      0.100    56   11.12
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =      3.83
 TOTAL AREA(ACRES) =      1.40   PEAK FLOW RATE(CFS) =      3.83

****************************************************************************
 FLOW PROCESS FROM NODE     25.00 TO NODE     26.00 IS CODE =  51
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    165.50  DOWNSTREAM(FEET) =    161.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =   330.00   CHANNEL SLOPE =  0.0133
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   0.020
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.818
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        3.87      0.30     0.100    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.06
  AVERAGE FLOW DEPTH(FEET) =   0.14   TRAVEL TIME(MIN.) =   1.80
  Tc(MIN.) =   12.92
  SUBAREA AREA(ACRES) =     3.87       SUBAREA RUNOFF(CFS) =    9.71
  EFFECTIVE AREA(ACRES) =      5.27     AREA-AVERAGED Fm(INCH/HR) =   0.03
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.10
  TOTAL AREA(ACRES) =        5.3         PEAK FLOW RATE(CFS) =      13.23

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.18   FLOW VELOCITY(FEET/SEC.) =   3.67
  LONGEST FLOWPATH FROM NODE     24.00 TO NODE     26.00 =     650.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     26.00 TO NODE     23.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   158.00  DOWNSTREAM(FEET) =   156.40
  FLOW LENGTH(FEET) =   315.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.61
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      13.23
  PIPE TRAVEL TIME(MIN.) =   0.94    Tc(MIN.) =   13.86
  LONGEST FLOWPATH FROM NODE     24.00 TO NODE     23.00 =     965.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     23.00 TO NODE     23.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.86
  RAINFALL INTENSITY(INCH/HR) =   2.71
  AREA-AVERAGED Fm(INCH/HR) =  0.03
```

```
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       5.27
 TOTAL STREAM AREA(ACRES) =       5.27
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      13.23

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       12.26   10.31    3.203  0.30( 0.03) 0.10       3.6      14.00
     1       12.75   11.37    3.030  0.30( 0.03) 0.10       4.0      21.00
     1       12.75   11.37    3.030  0.30( 0.03) 0.10       4.0      17.00
     1       12.54   15.08    2.582  0.30( 0.03) 0.10       4.7      18.00
     1       12.11   16.51    2.453  0.30( 0.03) 0.10       4.9      12.00
     1       10.87   19.99    2.201  0.30( 0.03) 0.10       5.0      10.00
     2       13.23   13.86    2.709  0.30( 0.03) 0.10       5.3      24.00

 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       23.91   10.31    3.203  0.30( 0.03) 0.10       7.5      14.00
     2       24.90   11.37    3.030  0.30( 0.03) 0.10       8.3      21.00
     3       24.90   11.37    3.030  0.30( 0.03) 0.10       8.3      17.00
     4       25.84   13.86    2.709  0.30( 0.03) 0.10       9.8      24.00
     5       25.14   15.08    2.582  0.30( 0.03) 0.10      10.0      18.00
     6       24.07   16.51    2.453  0.30( 0.03) 0.10      10.1      12.00
     7       21.59   19.99    2.201  0.30( 0.03) 0.10      10.2      10.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      25.84    Tc(MIN.) =    13.86
 EFFECTIVE AREA(ACRES) =       9.76   AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =       10.2
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     23.00 =    1730.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     23.00 TO NODE     27.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   156.40  DOWNSTREAM(FEET) =   155.40
 FLOW LENGTH(FEET) =   235.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  30.0 INCH PIPE IS  24.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.06
 GIVEN PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      25.84
 PIPE TRAVEL TIME(MIN.) =   0.65    Tc(MIN.) =   14.50
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     27.00 =    1965.00 FEET.

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

```
 FLOW PROCESS FROM NODE     27.00 TO NODE     27.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   14.50
 RAINFALL INTENSITY(INCH/HR) =   2.64
 AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       9.76
 TOTAL STREAM AREA(ACRES) =      10.23
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      25.84

****************************************************************************
 FLOW PROCESS FROM NODE     28.00 TO NODE     29.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   225.00
 ELEVATION DATA: UPSTREAM(FEET) =    170.00  DOWNSTREAM(FEET) =    166.50

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.101
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.310
 SUBAREA Tc 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        1.32      0.30     0.100    56    6.10
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =      5.08
 TOTAL AREA(ACRES) =      1.32   PEAK FLOW RATE(CFS) =      5.08

****************************************************************************
 FLOW PROCESS FROM NODE     29.00 TO NODE     30.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    164.20
 CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.0077
 CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   1.500
 MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.905
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B        2.72      0.30     0.100    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       9.84
```

```
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.31
 AVERAGE FLOW DEPTH(FEET) =   0.41   TRAVEL TIME(MIN.) =   1.16
 Tc(MIN.) =    7.26
 SUBAREA AREA(ACRES) =     2.72       SUBAREA RUNOFF(CFS) =    9.49
 EFFECTIVE AREA(ACRES) =      4.04     AREA-AVERAGED Fm(INCH/HR) =   0.03
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.10
 TOTAL AREA(ACRES) =        4.0         PEAK FLOW RATE(CFS) =      14.09

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.50   FLOW VELOCITY(FEET/SEC.) =   4.89
 LONGEST FLOWPATH FROM NODE     28.00 TO NODE     30.00 =     525.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     30.00 TO NODE     30.00 IS CODE =  82
----------------------------------------------------------------------------
 >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
 >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
 ELEVATION DATA: UPSTREAM(FEET) =    167.40  DOWNSTREAM(FEET) =    164.20

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.381
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.869
 SUBAREA Tc 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        2.23      0.30      0.100    56    7.38
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    2.23   INITIAL SUBAREA RUNOFF(CFS) =    7.71

 ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
 MAINLINE Tc(MIN.) =    7.26
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.905
 SUBAREA AREA(ACRES) =    2.23      SUBAREA RUNOFF(CFS) =    7.78
 EFFECTIVE AREA(ACRES) =      6.27   AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =        6.3       PEAK FLOW RATE(CFS) =      21.87

****************************************************************************
 FLOW PROCESS FROM NODE     30.00 TO NODE     27.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   158.00  DOWNSTREAM(FEET) =   155.40
 FLOW LENGTH(FEET) =   160.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   9.89
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      21.87
 PIPE TRAVEL TIME(MIN.) =   0.27    Tc(MIN.) =    7.53
 LONGEST FLOWPATH FROM NODE     28.00 TO NODE     27.00 =     685.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     27.00 TO NODE     27.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.53
  RAINFALL INTENSITY(INCH/HR) =   3.83
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       6.27
  TOTAL STREAM AREA(ACRES) =       6.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      21.87

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       23.91   10.96    3.094  0.30( 0.03) 0.10       7.5      14.00
      1       24.90   12.02    2.937  0.30( 0.03) 0.10       8.3      21.00
      1       24.90   12.02    2.937  0.30( 0.03) 0.10       8.3      17.00
      1       25.84   14.50    2.640  0.30( 0.03) 0.10       9.8      24.00
      1       25.14   15.73    2.521  0.30( 0.03) 0.10      10.0      18.00
      1       24.07   17.16    2.400  0.30( 0.03) 0.10      10.1      12.00
      1       21.59   20.65    2.161  0.30( 0.03) 0.10      10.2      10.00
      2       21.87    7.53    3.825  0.30( 0.03) 0.10       6.3      28.00

  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       42.22    7.53    3.825  0.30( 0.03) 0.10      11.4      28.00
      2       41.56   10.96    3.094  0.30( 0.03) 0.10      13.8      14.00
      3       41.64   12.02    2.937  0.30( 0.03) 0.10      14.6      21.00
      4       41.64   12.02    2.937  0.30( 0.03) 0.10      14.6      17.00
      5       40.87   14.50    2.640  0.30( 0.03) 0.10      16.0      24.00
      6       39.50   15.73    2.521  0.30( 0.03) 0.10      16.3      18.00
      7       37.73   17.16    2.400  0.30( 0.03) 0.10      16.4      12.00
      8       33.87   20.65    2.161  0.30( 0.03) 0.10      16.5      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      42.22    Tc(MIN.) =     7.53
  EFFECTIVE AREA(ACRES) =      11.44   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       16.5
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     27.00 =    1965.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     27.00 TO NODE     31.00 IS CODE =  41
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   155.40  DOWNSTREAM(FEET) =   155.00
  FLOW LENGTH(FEET) =   105.00   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.97
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      42.22
  PIPE TRAVEL TIME(MIN.) =   0.29    Tc(MIN.) =    7.82
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     31.00 =    2070.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     31.00 TO NODE     31.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     32.00 TO NODE     33.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.30  DOWNSTREAM(FEET) =    166.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.850
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.960
  SUBAREA Tc 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        2.62      0.30     0.100    56   11.85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      6.91
  TOTAL AREA(ACRES) =      2.62   PEAK FLOW RATE(CFS) =      6.91

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     34.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  166.00  DOWNSTREAM ELEVATION(FEET) =  165.60
  STREET LENGTH(FEET) =   485.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 25.00

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

```
  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) =      11.77
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.59
    HALFSTREET FLOOD WIDTH(FEET) =   27.48
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.04
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.61
  STREET FLOW TRAVEL TIME(MIN.) =   7.75   Tc(MIN.) =   19.60
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.226
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        4.89      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) =    4.89      SUBAREA RUNOFF(CFS) =    9.67
  EFFECTIVE AREA(ACRES) =      7.51    AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        7.5        PEAK FLOW RATE(CFS) =      14.84

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.63   HALFSTREET FLOOD WIDTH(FEET) =  31.40
  FLOW VELOCITY(FEET/SEC.) =  1.09   DEPTH*VELOCITY(FT*FT/SEC.) =   0.68
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  485.0 FT WITH ELEVATION-DROP =   0.4 FT, IS   11.3 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE     34.00
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     34.00 =     785.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     34.00 TO NODE     35.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    165.60  DOWNSTREAM(FEET) =    165.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =   180.00   CHANNEL SLOPE =  0.0011
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   0.020
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      14.84
  FLOW VELOCITY(FEET/SEC.) =   2.74   FLOW DEPTH(FEET) =   1.08
  TRAVEL TIME(MIN.) =   1.09   Tc(MIN.) =   20.70
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     35.00 =     965.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     35.00 TO NODE     35.00 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.) =   20.70
  RAINFALL INTENSITY(INCH/HR) =   2.16
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       7.51
  TOTAL STREAM AREA(ACRES) =       7.51
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      14.84

****************************************************************************
  FLOW PROCESS FROM NODE     35.00 TO NODE     35.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   665.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.20  DOWNSTREAM(FEET) =    165.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.351
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.767
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        6.31      0.30      0.100    56   13.35
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     15.54
  TOTAL AREA(ACRES) =      6.31   PEAK FLOW RATE(CFS) =     15.54

****************************************************************************
  FLOW PROCESS FROM NODE     35.00 TO NODE     35.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.35
  RAINFALL INTENSITY(INCH/HR) =   2.77
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       6.31
  TOTAL STREAM AREA(ACRES) =       6.31
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      15.54

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       14.84   20.70    2.159  0.30( 0.03) 0.10       7.5      32.00
      2       15.54   13.35    2.767  0.30( 0.03) 0.10       6.3      35.00
```

```
  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       27.85   13.35    2.767  0.30( 0.03) 0.10      11.2      35.00
      2       26.93   20.70    2.159  0.30( 0.03) 0.10      13.8      32.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      27.85    Tc(MIN.) =    13.35
  EFFECTIVE AREA(ACRES) =      11.15   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       13.8
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     35.00 =     965.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     35.00 TO NODE     31.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   159.00  DOWNSTREAM(FEET) =   155.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.67
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      27.85
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =   13.40
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     31.00 =    1015.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     31.00 TO NODE     31.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       27.85   13.40    2.761  0.30( 0.03) 0.10      11.2      35.00
      2       26.93   20.74    2.156  0.30( 0.03) 0.10      13.8      32.00
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     31.00 =    1015.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       42.22    7.82    3.744  0.30( 0.03) 0.10      11.4      28.00
      2       41.56   11.25    3.048  0.30( 0.03) 0.10      13.8      14.00
      3       41.64   12.31    2.896  0.30( 0.03) 0.10      14.6      21.00
      4       41.64   12.31    2.896  0.30( 0.03) 0.10      14.6      17.00
      5       40.87   14.81    2.609  0.30( 0.03) 0.10      16.0      24.00
      6       39.50   16.00    2.497  0.30( 0.03) 0.10      16.3      18.00
      7       37.73   17.43    2.379  0.30( 0.03) 0.10      16.4      12.00
```

```
     8       33.87   20.93    2.145  0.30( 0.03) 0.10      16.5      10.00
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     31.00 =    2070.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       64.34    7.82    3.744  0.30( 0.03) 0.10      18.0      28.00
      2       67.41   11.25    3.048  0.30( 0.03) 0.10      23.2      14.00
      3       68.51   12.31    2.896  0.30( 0.03) 0.10      24.8      21.00
      4       68.51   12.31    2.896  0.30( 0.03) 0.10      24.8      17.00
      5       69.16   13.40    2.761  0.30( 0.03) 0.10      26.4      35.00
      6       68.55   14.81    2.609  0.30( 0.03) 0.10      27.7      24.00
      7       67.02   16.00    2.497  0.30( 0.03) 0.10      28.4      18.00
      8       65.07   17.43    2.379  0.30( 0.03) 0.10      29.0      12.00
      9       61.01   20.74    2.156  0.30( 0.03) 0.10      30.3      32.00
     10       60.66   20.93    2.145  0.30( 0.03) 0.10      30.3      10.00
    TOTAL AREA(ACRES) =        30.3

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       69.16  Tc(MIN.) =   13.396
  EFFECTIVE AREA(ACRES) =     26.36  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       30.3
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     31.00 =    2070.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     31.00 TO NODE     36.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   155.00  DOWNSTREAM(FEET) =   153.80
  FLOW LENGTH(FEET) =   265.00   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.19
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      69.16
  PIPE TRAVEL TIME(MIN.) =   0.61    Tc(MIN.) =   14.01
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     36.00 =    2335.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     36.00 TO NODE     36.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.01
  RAINFALL INTENSITY(INCH/HR) =   2.69
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =      26.36
```

```
  TOTAL STREAM AREA(ACRES) =      30.32
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      69.16

****************************************************************************
  FLOW PROCESS FROM NODE     37.00 TO NODE     38.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   325.00
  ELEVATION DATA: UPSTREAM(FEET) =    169.50  DOWNSTREAM(FEET) =    168.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.011
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.456
  SUBAREA Tc 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        1.65      0.30     0.100    56    9.01
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      5.09
  TOTAL AREA(ACRES) =      1.65   PEAK FLOW RATE(CFS) =      5.09

****************************************************************************
  FLOW PROCESS FROM NODE     38.00 TO NODE     36.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   159.00  DOWNSTREAM(FEET) =   153.80
  FLOW LENGTH(FEET) =    70.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.01
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.09
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =    9.11
  LONGEST FLOWPATH FROM NODE     37.00 TO NODE     36.00 =     395.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     36.00 TO NODE     36.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.11
  RAINFALL INTENSITY(INCH/HR) =   3.44
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       1.65
  TOTAL STREAM AREA(ACRES) =       1.65
```

PEAK FLOW RATE(CFS) AT CONFLUENCE = 5.09

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	64.34	8.39	3.599	0.30(0.03)	0.10	18.0	28.00
1	67.41	11.88	2.955	0.30(0.03)	0.10	23.2	14.00
1	68.51	12.93	2.817	0.30(0.03)	0.10	24.8	21.00
1	68.51	12.93	2.817	0.30(0.03)	0.10	24.8	17.00
1	69.16	14.01	2.692	0.30(0.03)	0.10	26.4	35.00
1	68.55	15.43	2.549	0.30(0.03)	0.10	27.7	24.00
1	67.02	16.64	2.443	0.30(0.03)	0.10	28.4	18.00
1	65.07	18.00	2.337	0.30(0.03)	0.10	29.0	12.00
1	61.01	21.31	2.123	0.30(0.03)	0.10	30.3	32.00
1	60.66	21.50	2.113	0.30(0.03)	0.10	30.3	10.00
2	5.09	9.11	3.435	0.30(0.03)	0.10	1.6	37.00

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	69.25	8.39	3.599	0.30(0.03)	0.10	19.5	28.00
2	70.06	9.11	3.435	0.30(0.03)	0.10	20.7	37.00
3	71.78	11.88	2.955	0.30(0.03)	0.10	24.8	14.00
4	72.67	12.93	2.817	0.30(0.03)	0.10	26.5	21.00
5	72.67	12.93	2.817	0.30(0.03)	0.10	26.5	17.00
6	73.14	14.01	2.692	0.30(0.03)	0.10	28.0	35.00
7	72.31	15.43	2.549	0.30(0.03)	0.10	29.3	24.00
8	70.63	16.64	2.443	0.30(0.03)	0.10	30.0	18.00
9	68.52	18.00	2.337	0.30(0.03)	0.10	30.7	12.00
10	64.14	21.31	2.123	0.30(0.03)	0.10	32.0	32.00
11	63.78	21.50	2.113	0.30(0.03)	0.10	32.0	10.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 73.14 Tc(MIN.) = 14.01
EFFECTIVE AREA(ACRES) = 28.01 AREA-AVERAGED Fm(INCH/HR) = 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 32.0
LONGEST FLOWPATH FROM NODE 10.00 TO NODE 36.00 = 2335.00 FEET.

****
FLOW PROCESS FROM NODE 36.00 TO NODE 39.00 IS CODE = 41

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 153.80 DOWNSTREAM(FEET) = 152.80
FLOW LENGTH(FEET) = 230.00 MANNING'S N = 0.013
ASSUME FULL-FLOWING PIPELINE
PIPE-FLOW VELOCITY(FEET/SEC.) = 7.60
PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
GIVEN PIPE DIAMETER(INCH) = 42.00 NUMBER OF PIPES = 1

```
  PIPE-FLOW(CFS) =      73.14
  PIPE TRAVEL TIME(MIN.) =   0.50    Tc(MIN.) =   14.51
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     39.00 =    2565.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     39.00 TO NODE     39.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.51
  RAINFALL INTENSITY(INCH/HR) =   2.64
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =      28.01
  TOTAL STREAM AREA(ACRES) =      31.97
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      73.14

****************************************************************************
  FLOW PROCESS FROM NODE     40.00 TO NODE     39.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   320.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.40  DOWNSTREAM(FEET) =    167.20

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.359
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.766
  SUBAREA Tc 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        0.48      0.30      0.100    56   13.36
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      1.18
  TOTAL AREA(ACRES) =      0.48   PEAK FLOW RATE(CFS) =      1.18

****************************************************************************
  FLOW PROCESS FROM NODE     39.00 TO NODE     39.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.36
  RAINFALL INTENSITY(INCH/HR) =   2.77
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
```

EFFECTIVE STREAM AREA(ACRES) = 0.48
TOTAL STREAM AREA(ACRES) = 0.48
PEAK FLOW RATE(CFS) AT CONFLUENCE = 1.18

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	69.25	8.92	3.476	0.30(0.03)	0.10	19.5	28.00
1	70.06	9.63	3.328	0.30(0.03)	0.10	20.7	37.00
1	71.78	12.40	2.885	0.30(0.03)	0.10	24.8	14.00
1	72.67	13.44	2.756	0.30(0.03)	0.10	26.5	21.00
1	72.67	13.44	2.756	0.30(0.03)	0.10	26.5	17.00
1	73.14	14.51	2.639	0.30(0.03)	0.10	28.0	35.00
1	72.31	15.94	2.503	0.30(0.03)	0.10	29.3	24.00
1	70.63	17.16	2.400	0.30(0.03)	0.10	30.0	18.00
1	68.52	18.53	2.298	0.30(0.03)	0.10	30.7	12.00
1	64.14	21.81	2.096	0.30(0.03)	0.10	32.0	32.00
1	63.78	22.00	2.086	0.30(0.03)	0.10	32.0	10.00
2	1.18	13.36	2.766	0.30(0.03)	0.10	0.5	40.00

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	70.25	8.92	3.476	0.30(0.03)	0.10	19.8	28.00
2	71.09	9.63	3.328	0.30(0.03)	0.10	21.0	37.00
3	72.93	12.40	2.885	0.30(0.03)	0.10	25.3	14.00
4	73.79	13.36	2.766	0.30(0.03)	0.10	26.8	40.00
5	73.85	13.44	2.756	0.30(0.03)	0.10	27.0	21.00
6	73.85	13.44	2.756	0.30(0.03)	0.10	27.0	17.00
7	74.27	14.51	2.639	0.30(0.03)	0.10	28.5	35.00
8	73.38	15.94	2.503	0.30(0.03)	0.10	29.8	24.00
9	71.65	17.16	2.400	0.30(0.03)	0.10	30.5	18.00
10	69.50	18.53	2.298	0.30(0.03)	0.10	31.2	12.00
11	65.03	21.81	2.096	0.30(0.03)	0.10	32.4	32.00
12	64.66	22.00	2.086	0.30(0.03)	0.10	32.5	10.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 74.27 Tc(MIN.) = 14.51
EFFECTIVE AREA(ACRES) = 28.49 AREA-AVERAGED Fm(INCH/HR) = 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 32.5
LONGEST FLOWPATH FROM NODE 10.00 TO NODE 39.00 = 2565.00 FEET.

****
FLOW PROCESS FROM NODE 39.00 TO NODE 41.00 IS CODE = 41

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 152.80 DOWNSTREAM(FEET) = 152.00
FLOW LENGTH(FEET) = 210.00 MANNING'S N = 0.013

```
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  34.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.73
  GIVEN PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      74.27
  PIPE TRAVEL TIME(MIN.) =   0.45    Tc(MIN.) =   14.97
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     41.00 =    2775.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     41.00 TO NODE     41.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.97
  RAINFALL INTENSITY(INCH/HR) =   2.59
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =      28.49
  TOTAL STREAM AREA(ACRES) =      32.45
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      74.27

****************************************************************************
  FLOW PROCESS FROM NODE     42.00 TO NODE     41.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   230.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.00  DOWNSTREAM(FEET) =    163.20

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.464
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.171
  SUBAREA Tc 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        0.66      0.30      0.100    56    6.46
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      2.46
  TOTAL AREA(ACRES) =      0.66   PEAK FLOW RATE(CFS) =      2.46

****************************************************************************
  FLOW PROCESS FROM NODE     41.00 TO NODE     41.00 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.) =    6.46
  RAINFALL INTENSITY(INCH/HR) =   4.17
```

AREA-AVERAGED Fm(INCH/HR) = 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.10
EFFECTIVE STREAM AREA(ACRES) = 0.66
TOTAL STREAM AREA(ACRES) = 0.66
PEAK FLOW RATE(CFS) AT CONFLUENCE = 2.46

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	70.25	9.38	3.379	0.30(0.03)	0.10	19.8	28.00
1	71.09	10.09	3.242	0.30(0.03)	0.10	21.0	37.00
1	72.93	12.85	2.827	0.30(0.03)	0.10	25.3	14.00
1	73.79	13.81	2.714	0.30(0.03)	0.10	26.8	40.00
1	73.85	13.89	2.705	0.30(0.03)	0.10	27.0	21.00
1	73.85	13.89	2.705	0.30(0.03)	0.10	27.0	17.00
1	74.27	14.97	2.593	0.30(0.03)	0.10	28.5	35.00
1	73.38	16.39	2.463	0.30(0.03)	0.10	29.8	24.00
1	71.65	17.61	2.365	0.30(0.03)	0.10	30.5	18.00
1	69.50	18.99	2.266	0.30(0.03)	0.10	31.2	12.00
1	65.03	22.27	2.071	0.30(0.03)	0.10	32.4	32.00
1	64.66	22.46	2.061	0.30(0.03)	0.10	32.5	10.00
2	2.46	6.46	4.171	0.30(0.03)	0.10	0.7	42.00

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	62.33	6.46	4.171	0.30(0.03)	0.10	14.3	42.00
2	72.24	9.38	3.379	0.30(0.03)	0.10	20.5	28.00
3	73.00	10.09	3.242	0.30(0.03)	0.10	21.7	37.00
4	74.59	12.85	2.827	0.30(0.03)	0.10	25.9	14.00
5	75.38	13.81	2.714	0.30(0.03)	0.10	27.5	40.00
6	75.44	13.89	2.705	0.30(0.03)	0.10	27.6	21.00
7	75.44	13.89	2.705	0.30(0.03)	0.10	27.6	17.00
8	75.79	14.97	2.593	0.30(0.03)	0.10	29.2	35.00
9	74.83	16.39	2.463	0.30(0.03)	0.10	30.5	24.00
10	73.04	17.61	2.365	0.30(0.03)	0.10	31.2	18.00
11	70.83	18.99	2.266	0.30(0.03)	0.10	31.8	12.00
12	66.24	22.27	2.071	0.30(0.03)	0.10	33.1	32.00
13	65.87	22.46	2.061	0.30(0.03)	0.10	33.1	10.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 75.79 Tc(MIN.) = 14.97
EFFECTIVE AREA(ACRES) = 29.15 AREA-AVERAGED Fm(INCH/HR) = 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 33.1
LONGEST FLOWPATH FROM NODE 10.00 TO NODE 41.00 = 2775.00 FEET.

****
FLOW PROCESS FROM NODE 41.00 TO NODE 43.00 IS CODE = 41

```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   152.00  DOWNSTREAM(FEET) =   151.80
  FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  28.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.73
  GIVEN PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      75.79
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =   15.02
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     43.00 =    2805.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     43.00 TO NODE     43.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     44.00 TO NODE     45.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   350.00
  ELEVATION DATA: UPSTREAM(FEET) =    164.00  DOWNSTREAM(FEET) =    162.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.894
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.482
  SUBAREA Tc 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        1.55      0.30     0.100    56    8.89
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      4.82
  TOTAL AREA(ACRES) =      1.55   PEAK FLOW RATE(CFS) =      4.82

****************************************************************************
  FLOW PROCESS FROM NODE     45.00 TO NODE     46.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    162.00  DOWNSTREAM(FEET) =    161.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =   165.00   CHANNEL SLOPE =  0.0012
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   0.040
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
  CHANNEL FLOW THRU SUBAREA(CFS) =       4.82
  FLOW VELOCITY(FEET/SEC.) =   2.16   FLOW DEPTH(FEET) =   0.74
  TRAVEL TIME(MIN.) =   1.27   Tc(MIN.) =   10.17
  LONGEST FLOWPATH FROM NODE     44.00 TO NODE     46.00 =     515.00 FEET.
```

```
****************************************************************************
 FLOW PROCESS FROM NODE     46.00 TO NODE     46.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   10.17
 RAINFALL INTENSITY(INCH/HR) =   3.23
 AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       1.55
 TOTAL STREAM AREA(ACRES) =       1.55
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       4.82

****************************************************************************
 FLOW PROCESS FROM NODE     47.00 TO NODE     46.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   285.00
 ELEVATION DATA: UPSTREAM(FEET) =    165.00  DOWNSTREAM(FEET) =    161.80

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.157
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.937
 SUBAREA Tc 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        1.23      0.30     0.100    56    7.16
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =      4.33
 TOTAL AREA(ACRES) =      1.23   PEAK FLOW RATE(CFS) =      4.33

****************************************************************************
 FLOW PROCESS FROM NODE     46.00 TO NODE     46.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    7.16
 RAINFALL INTENSITY(INCH/HR) =   3.94
 AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       1.23
 TOTAL STREAM AREA(ACRES) =       1.23
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       4.33
```

```
 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        4.82   10.17    3.228  0.30( 0.03) 0.10       1.5      44.00
     2        4.33    7.16    3.937  0.30( 0.03) 0.10       1.2      47.00

 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        8.47    7.16    3.937  0.30( 0.03) 0.10       2.3      47.00
     2        8.36   10.17    3.228  0.30( 0.03) 0.10       2.8      44.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       8.47    Tc(MIN.) =     7.16
 EFFECTIVE AREA(ACRES) =       2.32   AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =        2.8
 LONGEST FLOWPATH FROM NODE     44.00 TO NODE     46.00 =     515.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     46.00 TO NODE     43.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   157.00  DOWNSTREAM(FEET) =   151.80
 FLOW LENGTH(FEET) =   115.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   7.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  11.55
 GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       8.47
 PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =    7.32
 LONGEST FLOWPATH FROM NODE     44.00 TO NODE     43.00 =     630.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     43.00 TO NODE     43.00 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        8.47    7.32    3.887  0.30( 0.03) 0.10       2.3      47.00
     2        8.36   10.33    3.199  0.30( 0.03) 0.10       2.8      44.00
 LONGEST FLOWPATH FROM NODE     44.00 TO NODE     43.00 =     630.00 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       62.33    6.52    4.152  0.30( 0.03) 0.10      14.3      42.00
```

2	72.24	9.43	3.368	0.30(0.03)	0.10	20.5	28.00
3	73.00	10.14	3.232	0.30(0.03)	0.10	21.7	37.00
4	74.59	12.90	2.821	0.30(0.03)	0.10	25.9	14.00
5	75.38	13.86	2.708	0.30(0.03)	0.10	27.5	40.00
6	75.44	13.94	2.699	0.30(0.03)	0.10	27.6	21.00
7	75.44	13.95	2.699	0.30(0.03)	0.10	27.6	17.00
8	75.79	15.02	2.588	0.30(0.03)	0.10	29.2	35.00
9	74.83	16.44	2.459	0.30(0.03)	0.10	30.5	24.00
10	73.04	17.67	2.361	0.30(0.03)	0.10	31.2	18.00
11	70.83	19.04	2.263	0.30(0.03)	0.10	31.8	12.00
12	66.24	22.33	2.068	0.30(0.03)	0.10	33.1	32.00
13	65.87	22.51	2.058	0.30(0.03)	0.10	33.1	10.00

LONGEST FLOWPATH FROM NODE 10.00 TO NODE 43.00 = 2805.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	70.38	6.52	4.152	0.30(0.03)	0.10	16.4	42.00
2	73.54	7.32	3.887	0.30(0.03)	0.10	18.3	47.00
3	80.63	9.43	3.368	0.30(0.03)	0.10	23.1	28.00
4	81.36	10.14	3.232	0.30(0.03)	0.10	24.4	37.00
5	81.46	10.33	3.199	0.30(0.03)	0.10	24.8	44.00
6	81.95	12.90	2.821	0.30(0.03)	0.10	28.7	14.00
7	82.44	13.86	2.708	0.30(0.03)	0.10	30.3	40.00
8	82.48	13.94	2.699	0.30(0.03)	0.10	30.4	21.00
9	82.48	13.95	2.699	0.30(0.03)	0.10	30.4	17.00
10	82.54	15.02	2.588	0.30(0.03)	0.10	31.9	35.00
11	81.23	16.44	2.459	0.30(0.03)	0.10	33.3	24.00
12	79.19	17.67	2.361	0.30(0.03)	0.10	33.9	18.00
13	76.72	19.04	2.263	0.30(0.03)	0.10	34.6	12.00
14	71.62	22.33	2.068	0.30(0.03)	0.10	35.9	32.00
15	71.22	22.51	2.058	0.30(0.03)	0.10	35.9	10.00

TOTAL AREA(ACRES) = 35.9

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 82.54 Tc(MIN.) = 15.018
EFFECTIVE AREA(ACRES) = 31.93 AREA-AVERAGED Fm(INCH/HR) = 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 35.9
LONGEST FLOWPATH FROM NODE 10.00 TO NODE 43.00 = 2805.00 FEET.

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 35.9 TC(MIN.) = 15.02
EFFECTIVE AREA(ACRES) = 31.93 AREA-AVERAGED Fm(INCH/HR)= 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.100
PEAK FLOW RATE(CFS) = 82.54

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	70.38	6.52	4.152	0.30(0.03)	0.10	16.4	42.00
2	73.54	7.32	3.887	0.30(0.03)	0.10	18.3	47.00
3	80.63	9.43	3.368	0.30(0.03)	0.10	23.1	28.00
4	81.36	10.14	3.232	0.30(0.03)	0.10	24.4	37.00

5	81.46	10.33	3.199	0.30(0.03)	0.10	24.8	44.00
6	81.95	12.90	2.821	0.30(0.03)	0.10	28.7	14.00
7	82.44	13.86	2.708	0.30(0.03)	0.10	30.3	40.00
8	82.48	13.94	2.699	0.30(0.03)	0.10	30.4	21.00
9	82.48	13.95	2.699	0.30(0.03)	0.10	30.4	17.00
10	82.54	15.02	2.588	0.30(0.03)	0.10	31.9	35.00
11	81.23	16.44	2.459	0.30(0.03)	0.10	33.3	24.00
12	79.19	17.67	2.361	0.30(0.03)	0.10	33.9	18.00
13	76.72	19.04	2.263	0.30(0.03)	0.10	34.6	12.00
14	71.62	22.33	2.068	0.30(0.03)	0.10	35.9	32.00
15	71.22	22.51	2.058	0.30(0.03)	0.10	35.9	10.00

END OF RATIONAL METHOD ANALYSIS

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

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 ************************** DESCRIPTION OF STUDY **************************
* FREEMAN                                                                 *
* EXISTING CONDITION                                                      *
* 100 YEAR ANALYSIS                                                       *
 *************************************************************************

  FILE NAME: FREX100.DAT
  TIME/DATE OF STUDY: 09:04 05/29/2017
=============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
=============================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   24.0     19.0    0.020/0.020/0.020   0.67    2.00 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.67 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

*****************************************************************************
  FLOW PROCESS FROM NODE     10.00 TO NODE     32.00 IS CODE =  21
```

```
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   265.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.50  DOWNSTREAM(FEET) =    166.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.337
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.616
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        0.15      0.30     0.100    76    8.34
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.62
  TOTAL AREA(ACRES) =      0.15   PEAK FLOW RATE(CFS) =      0.62

****************************************************************************
  FLOW PROCESS FROM NODE     32.00 TO NODE     11.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  166.30  DOWNSTREAM ELEVATION(FEET) =  165.10
  STREET LENGTH(FEET) =   210.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 25.00

  DISTANCE FROM CROWN 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) =       0.83
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.26
    HALFSTREET FLOOD WIDTH(FEET) =    6.85
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.42
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.37
  STREET FLOW TRAVEL TIME(MIN.) =   2.47   Tc(MIN.) =   10.81
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.978
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        0.12      0.30     0.100    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.12      SUBAREA RUNOFF(CFS) =    0.43
  EFFECTIVE AREA(ACRES) =      0.27    AREA-AVERAGED Fm(INCH/HR) =  0.03
```

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  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        0.3        PEAK FLOW RATE(CFS) =       0.96

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.27   HALFSTREET FLOOD WIDTH(FEET) =   7.33
  FLOW VELOCITY(FEET/SEC.) =  1.46   DEPTH*VELOCITY(FT*FT/SEC.) =   0.40
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     11.00 =     475.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     11.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.81
  RAINFALL INTENSITY(INCH/HR) =   3.98
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       0.27
  TOTAL STREAM AREA(ACRES) =       0.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.96

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE     11.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   210.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.00  DOWNSTREAM(FEET) =    165.10

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.680
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.838
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        0.76      0.30      0.100    76    7.68
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      3.29
  TOTAL AREA(ACRES) =      0.76   PEAK FLOW RATE(CFS) =      3.29

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     11.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.68
```

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 RAINFALL INTENSITY(INCH/HR) =   4.84
 AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       0.76
 TOTAL STREAM AREA(ACRES) =       0.76
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       3.29

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1        0.96   10.81    3.978  0.30( 0.03) 0.10       0.3      10.00
     2        3.29    7.68    4.838  0.30( 0.03) 0.10       0.8      12.00

 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        4.12    7.68    4.838  0.30( 0.03) 0.10       1.0      12.00
     2        3.66   10.81    3.978  0.30( 0.03) 0.10       1.0      10.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       4.12    Tc(MIN.) =     7.68
 EFFECTIVE AREA(ACRES) =       0.95   AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =        1.0
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     11.00 =     475.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     11.00 TO NODE     13.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  165.10  DOWNSTREAM ELEVATION(FEET) =  164.20
 STREET LENGTH(FEET) =   455.00   CURB HEIGHT(INCHES) =  8.0
 STREET HALFWIDTH(FEET) = 24.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  19.00
 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) =       4.69
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.51
   HALFSTREET FLOOD WIDTH(FEET) =   17.65
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.42
```

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   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.73
 STREET FLOW TRAVEL TIME(MIN.) =   5.34   Tc(MIN.) =   13.02
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.575
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B        0.36      0.30     0.100    76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    0.36      SUBAREA RUNOFF(CFS) =    1.15
 EFFECTIVE AREA(ACRES) =      1.31    AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =        1.4        PEAK FLOW RATE(CFS) =       4.19

 END OF SUBAREA STREET FLOW HYDRAULICS:
 DEPTH(FEET) = 0.50   HALFSTREET FLOOD WIDTH(FEET) =  16.91
 FLOW VELOCITY(FEET/SEC.) =  1.37   DEPTH*VELOCITY(FT*FT/SEC.) =   0.68
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     13.00 =     930.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   13.02
 RAINFALL INTENSITY(INCH/HR) =   3.58
 AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       1.31
 TOTAL STREAM AREA(ACRES) =       1.39
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       4.19

****************************************************************************
 FLOW PROCESS FROM NODE     14.00 TO NODE     15.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   125.00
 ELEVATION DATA: UPSTREAM(FEET) =    164.60  DOWNSTREAM(FEET) =    164.20

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.616
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.270
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 COMMERCIAL                 B        0.15      0.30     0.100    76    6.62
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =      0.71
```

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  TOTAL AREA(ACRES) =      0.15   PEAK FLOW RATE(CFS) =      0.71

****************************************************************************
  FLOW PROCESS FROM NODE     15.00 TO NODE     13.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   159.30  DOWNSTREAM(FEET) =   159.20
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.88
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.71
  PIPE TRAVEL TIME(MIN.) =   0.44    Tc(MIN.) =    7.06
  LONGEST FLOWPATH FROM NODE     14.00 TO NODE     13.00 =     175.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.06
  RAINFALL INTENSITY(INCH/HR) =   5.08
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       0.15
  TOTAL STREAM AREA(ACRES) =       0.15
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.71

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        4.19   13.02    3.575  0.30( 0.03) 0.10       1.3      12.00
      1        3.89   16.31    3.142  0.30( 0.03) 0.10       1.4      10.00
      2        0.71    7.06    5.077  0.30( 0.03) 0.10       0.2      14.00

  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        3.94    7.06    5.077  0.30( 0.03) 0.10       0.9      14.00
      2        4.68   13.02    3.575  0.30( 0.03) 0.10       1.5      12.00
      3        4.33   16.31    3.142  0.30( 0.03) 0.10       1.5      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       4.68    Tc(MIN.) =    13.02
  EFFECTIVE AREA(ACRES) =       1.46   AREA-AVERAGED Fm(INCH/HR) =  0.03
```

```
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =        1.5
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     13.00 =     930.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     13.00 TO NODE     16.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   159.20  DOWNSTREAM(FEET) =   158.10
 FLOW LENGTH(FEET) =   285.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.93
 GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       4.68
 PIPE TRAVEL TIME(MIN.) =   1.21    Tc(MIN.) =   14.23
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     16.00 =    1215.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 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.) =   14.23
 RAINFALL INTENSITY(INCH/HR) =   3.40
 AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       1.46
 TOTAL STREAM AREA(ACRES) =       1.54
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       4.68

****************************************************************************
 FLOW PROCESS FROM NODE     17.00 TO NODE     16.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   310.00
 ELEVATION DATA: UPSTREAM(FEET) =    166.00  DOWNSTREAM(FEET) =    164.90

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.320
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.330
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 COMMERCIAL                 B        1.52      0.30      0.100    76    9.32
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =      5.88
```

```
  TOTAL AREA(ACRES) =      1.52   PEAK FLOW RATE(CFS) =      5.88

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 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.) =    9.32
  RAINFALL INTENSITY(INCH/HR) =   4.33
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       1.52
  TOTAL STREAM AREA(ACRES) =       1.52
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       5.88

****************************************************************************
  FLOW PROCESS FROM NODE     18.00 TO NODE     19.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   320.00
  ELEVATION DATA: UPSTREAM(FEET) =    165.90  DOWNSTREAM(FEET) =    165.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.888
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.186
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        1.26      0.30      0.100    76    9.89
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      4.71
  TOTAL AREA(ACRES) =      1.26   PEAK FLOW RATE(CFS) =      4.71

****************************************************************************
  FLOW PROCESS FROM NODE     19.00 TO NODE     16.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    165.00  DOWNSTREAM(FEET) =    164.90
  CHANNEL LENGTH THRU SUBAREA(FEET) =   265.00   CHANNEL SLOPE =  0.0004
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   0.040
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00

         ==>>WARNING: FLOW IN CHANNEL EXCEEDS CHANNEL
             CAPACITY( NORMAL DEPTH EQUAL TO SPECIFIED MAXIMUM
             ALLOWABLE DEPTH).
             AS AN APPROXIMATION, FLOWDEPTH IS SET AT MAXIMUM
```

ALLOWABLE DEPTH AND IS USED FOR TRAVELTIME CALCULATIONS.

CHANNEL FLOW THRU SUBAREA(CFS) = 4.71
FLOW VELOCITY(FEET/SEC.) = 1.55 FLOW DEPTH(FEET) = 1.00
TRAVEL TIME(MIN.) = 2.85 Tc(MIN.) = 12.74
LONGEST FLOWPATH FROM NODE 18.00 TO NODE 16.00 = 585.00 FEET.

****
FLOW PROCESS FROM NODE 16.00 TO NODE 16.00 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.) = 12.74
RAINFALL INTENSITY(INCH/HR) = 3.62
AREA-AVERAGED Fm(INCH/HR) = 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.10
EFFECTIVE STREAM AREA(ACRES) = 1.26
TOTAL STREAM AREA(ACRES) = 1.26
PEAK FLOW RATE(CFS) AT CONFLUENCE = 4.71

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3.94	8.31	4.624	0.30(0.03)	0.10	0.9	14.00
1	4.68	14.23	3.398	0.30(0.03)	0.10	1.5	12.00
1	4.33	17.54	3.014	0.30(0.03)	0.10	1.5	10.00
2	5.88	9.32	4.330	0.30(0.03)	0.10	1.5	17.00
3	4.71	12.74	3.621	0.30(0.03)	0.10	1.3	18.00

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	13.48	8.31	4.624	0.30(0.03)	0.10	3.0	14.00
2	14.08	9.32	4.330	0.30(0.03)	0.10	3.4	17.00
3	14.20	12.74	3.621	0.30(0.03)	0.10	4.1	18.00
4	13.71	14.23	3.398	0.30(0.03)	0.10	4.2	12.00
5	12.33	17.54	3.014	0.30(0.03)	0.10	4.3	10.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 14.20 Tc(MIN.) = 12.74
EFFECTIVE AREA(ACRES) = 4.09 AREA-AVERAGED Fm(INCH/HR) = 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 4.3
LONGEST FLOWPATH FROM NODE 10.00 TO NODE 16.00 = 1215.00 FEET.

****
FLOW PROCESS FROM NODE 16.00 TO NODE 20.00 IS CODE = 41

```
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   158.10  DOWNSTREAM(FEET) =   157.60
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.52
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      14.20
  PIPE TRAVEL TIME(MIN.) =   0.55    Tc(MIN.) =   13.29
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     20.00 =    1365.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     20.00 TO NODE     20.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.29
  RAINFALL INTENSITY(INCH/HR) =   3.53
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       4.09
  TOTAL STREAM AREA(ACRES) =       4.32
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      14.20

****************************************************************************
  FLOW PROCESS FROM NODE     21.00 TO NODE     22.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   260.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.00  DOWNSTREAM(FEET) =    165.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.819
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.203
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        0.64      0.30      0.100    76    9.82
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      2.40
  TOTAL AREA(ACRES) =      0.64   PEAK FLOW RATE(CFS) =      2.40

****************************************************************************
  FLOW PROCESS FROM NODE     22.00 TO NODE     20.00 IS CODE =  31
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   158.20  DOWNSTREAM(FEET) =   157.60
  FLOW LENGTH(FEET) =    20.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   5.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.22
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.40
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    9.87
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     20.00 =     280.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     20.00 TO NODE     20.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.87
  RAINFALL INTENSITY(INCH/HR) =   4.19
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       0.64
  TOTAL STREAM AREA(ACRES) =       0.64
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.40

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       13.48    8.90    4.448  0.30( 0.03) 0.10       3.0      14.00
      1       14.08    9.88    4.189  0.30( 0.03) 0.10       3.4      17.00
      1       14.20   13.29    3.534  0.30( 0.03) 0.10       4.1      18.00
      1       13.71   14.80    3.322  0.30( 0.03) 0.10       4.2      12.00
      1       12.33   18.08    2.962  0.30( 0.03) 0.10       4.3      10.00
      2        2.40    9.87    4.192  0.30( 0.03) 0.10       0.6      21.00

  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       15.78    8.90    4.448  0.30( 0.03) 0.10       3.6      14.00
      2       16.47    9.87    4.192  0.30( 0.03) 0.10       4.0      21.00
      3       16.48    9.88    4.189  0.30( 0.03) 0.10       4.0      17.00
      4       16.23   13.29    3.534  0.30( 0.03) 0.10       4.7      18.00
      5       15.61   14.80    3.322  0.30( 0.03) 0.10       4.9      12.00
      6       14.02   18.08    2.962  0.30( 0.03) 0.10       5.0      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
```

```
  PEAK FLOW RATE(CFS) =      16.48    Tc(MIN.) =     9.88
  EFFECTIVE AREA(ACRES) =       4.05   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        5.0
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     20.00 =    1365.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     20.00 TO NODE     23.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   157.60  DOWNSTREAM(FEET) =   156.40
  FLOW LENGTH(FEET) =   365.00   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.25
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      16.48
  PIPE TRAVEL TIME(MIN.) =   1.16    Tc(MIN.) =   11.04
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     23.00 =    1730.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     23.00 TO NODE     23.00 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.) =   11.04
  RAINFALL INTENSITY(INCH/HR) =   3.93
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       4.05
  TOTAL STREAM AREA(ACRES) =       4.96
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      16.48

****************************************************************************
  FLOW PROCESS FROM NODE     24.00 TO NODE     25.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   320.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.00  DOWNSTREAM(FEET) =    165.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.122
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.913
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        1.40      0.30     0.100    76   11.12
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      4.89
  TOTAL AREA(ACRES) =      1.40   PEAK FLOW RATE(CFS) =      4.89

****************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE     26.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    165.50  DOWNSTREAM(FEET) =    161.10
  CHANNEL LENGTH THRU SUBAREA(FEET) =   330.00   CHANNEL SLOPE =  0.0133
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   0.020
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.619
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        3.87      0.30     0.100    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      11.15
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.38
  AVERAGE FLOW DEPTH(FEET) =   0.16   TRAVEL TIME(MIN.) =   1.63
  Tc(MIN.) =   12.75
  SUBAREA AREA(ACRES) =     3.87       SUBAREA RUNOFF(CFS) =   12.50
  EFFECTIVE AREA(ACRES) =      5.27     AREA-AVERAGED Fm(INCH/HR) =   0.03
  AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.10
  TOTAL AREA(ACRES) =        5.3         PEAK FLOW RATE(CFS) =      17.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.21   FLOW VELOCITY(FEET/SEC.) =   4.04
  LONGEST FLOWPATH FROM NODE     24.00 TO NODE     26.00 =     650.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     26.00 TO NODE     23.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   158.00  DOWNSTREAM(FEET) =   156.40
  FLOW LENGTH(FEET) =   315.00   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.42
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      17.02
  PIPE TRAVEL TIME(MIN.) =   0.97    Tc(MIN.) =   13.72
  LONGEST FLOWPATH FROM NODE     24.00 TO NODE     23.00 =     965.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     23.00 TO NODE     23.00 IS CODE =   1
----------------------------------------------------------------------------
```

```
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.72
  RAINFALL INTENSITY(INCH/HR) =   3.47
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       5.27
  TOTAL STREAM AREA(ACRES) =       5.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      17.02

  ** CONFLUENCE DATA **
   STREAM       Q      Tc    Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1       15.78   10.11    4.134  0.30( 0.03) 0.10       3.6      14.00
      1       16.47   11.03    3.933  0.30( 0.03) 0.10       4.0      21.00
      1       16.48   11.04    3.930  0.30( 0.03) 0.10       4.0      17.00
      1       16.23   14.47    3.366  0.30( 0.03) 0.10       4.7      18.00
      1       15.61   16.03    3.174  0.30( 0.03) 0.10       4.9      12.00
      1       14.02   19.45    2.841  0.30( 0.03) 0.10       5.0      10.00
      2       17.02   13.72    3.470  0.30( 0.03) 0.10       5.3      24.00

  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       30.74   10.11    4.134  0.30( 0.03) 0.10       7.5      14.00
      2       31.99   11.03    3.933  0.30( 0.03) 0.10       8.3      21.00
      3       32.01   11.04    3.930  0.30( 0.03) 0.10       8.3      17.00
      4       33.30   13.72    3.470  0.30( 0.03) 0.10       9.9      24.00
      5       32.73   14.47    3.366  0.30( 0.03) 0.10      10.0      18.00
      6       31.17   16.03    3.174  0.30( 0.03) 0.10      10.2      12.00
      7       27.93   19.45    2.841  0.30( 0.03) 0.10      10.2      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      33.30    Tc(MIN.) =    13.72
  EFFECTIVE AREA(ACRES) =       9.85   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       10.2
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     23.00 =    1730.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     23.00 TO NODE     27.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   156.40  DOWNSTREAM(FEET) =   155.40
  FLOW LENGTH(FEET) =   235.00   MANNING'S N =  0.013
```

```
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.78
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      33.30
  PIPE TRAVEL TIME(MIN.) =   0.58    Tc(MIN.) =   14.30
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     27.00 =    1965.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     27.00 TO NODE     27.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.30
  RAINFALL INTENSITY(INCH/HR) =   3.39
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       9.85
  TOTAL STREAM AREA(ACRES) =      10.23
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      33.30

****************************************************************************
  FLOW PROCESS FROM NODE     28.00 TO NODE     29.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   225.00
  ELEVATION DATA: UPSTREAM(FEET) =    170.00  DOWNSTREAM(FEET) =    166.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.101
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.521
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        1.32      0.30      0.100    76    6.10
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      6.52
  TOTAL AREA(ACRES) =      1.32   PEAK FLOW RATE(CFS) =      6.52

****************************************************************************
  FLOW PROCESS FROM NODE     29.00 TO NODE     30.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    164.20
  CHANNEL LENGTH THRU SUBAREA(FEET) =   300.00   CHANNEL SLOPE =  0.0077
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   1.500
```

```
 MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.037
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                B        2.72      0.30     0.100    76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      12.66
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.72
 AVERAGE FLOW DEPTH(FEET) =   0.47   TRAVEL TIME(MIN.) =   1.06
 Tc(MIN.) =    7.16
 SUBAREA AREA(ACRES) =     2.72       SUBAREA RUNOFF(CFS) =   12.26
 EFFECTIVE AREA(ACRES) =      4.04     AREA-AVERAGED Fm(INCH/HR) =   0.03
 AREA-AVERAGED Fp(INCH/HR) =   0.30  AREA-AVERAGED Ap =   0.10
 TOTAL AREA(ACRES) =        4.0         PEAK FLOW RATE(CFS) =      18.20

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.58   FLOW VELOCITY(FEET/SEC.) =   5.32
 LONGEST FLOWPATH FROM NODE     28.00 TO NODE     30.00 =     525.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     30.00 TO NODE     30.00 IS CODE =  82
----------------------------------------------------------------------------
 >>>>>ADD SUBAREA RUNOFF TO MAINLINE, AT MAINLINE Tc,<<<<<
 >>>>>(AND COMPUTE INITIAL SUBAREA RUNOFF)<<<<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
 ELEVATION DATA: UPSTREAM(FEET) =    167.40  DOWNSTREAM(FEET) =    164.20

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.381
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.950
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 COMMERCIAL                B        2.23      0.30     0.100    76    7.38
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    2.23   INITIAL SUBAREA RUNOFF(CFS) =    9.87

 ** ADD SUBAREA RUNOFF TO MAINLINE AT MAINLINE Tc:
 MAINLINE Tc(MIN.) =    7.16
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.037
 SUBAREA AREA(ACRES) =    2.23      SUBAREA RUNOFF(CFS) =   10.05
 EFFECTIVE AREA(ACRES) =      6.27   AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =        6.3       PEAK FLOW RATE(CFS) =      28.25

****************************************************************************
 FLOW PROCESS FROM NODE     30.00 TO NODE     27.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
```

```
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   158.00  DOWNSTREAM(FEET) =   155.40
  FLOW LENGTH(FEET) =   160.00   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.99
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      28.25
  PIPE TRAVEL TIME(MIN.) =   0.30    Tc(MIN.) =    7.46
  LONGEST FLOWPATH FROM NODE     28.00 TO NODE     27.00 =     685.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     27.00 TO NODE     27.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.46
  RAINFALL INTENSITY(INCH/HR) =   4.92
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       6.27
  TOTAL STREAM AREA(ACRES) =       6.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      28.25

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1       30.74   10.73    3.994  0.30( 0.03) 0.10       7.5      14.00
      1       31.99   11.63    3.815  0.30( 0.03) 0.10       8.3      21.00
      1       32.01   11.64    3.813  0.30( 0.03) 0.10       8.3      17.00
      1       33.30   14.30    3.389  0.30( 0.03) 0.10       9.9      24.00
      1       32.73   15.06    3.290  0.30( 0.03) 0.10      10.0      18.00
      1       31.17   16.64    3.106  0.30( 0.03) 0.10      10.2      12.00
      1       27.93   20.13    2.785  0.30( 0.03) 0.10      10.2      10.00
      2       28.25    7.46    4.921  0.30( 0.03) 0.10       6.3      28.00

  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       54.60    7.46    4.921  0.30( 0.03) 0.10      11.5      28.00
      2       53.64   10.73    3.994  0.30( 0.03) 0.10      13.8      14.00
      3       53.86   11.63    3.815  0.30( 0.03) 0.10      14.5      21.00
      4       53.86   11.64    3.813  0.30( 0.03) 0.10      14.6      17.00
      5       52.71   14.30    3.389  0.30( 0.03) 0.10      16.1      24.00
      6       51.56   15.06    3.290  0.30( 0.03) 0.10      16.3      18.00
      7       48.94   16.64    3.106  0.30( 0.03) 0.10      16.4      12.00
      8       43.85   20.13    2.785  0.30( 0.03) 0.10      16.5      10.00
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      54.60    Tc(MIN.) =     7.46
  EFFECTIVE AREA(ACRES) =      11.48   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       16.5
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     27.00 =    1965.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     27.00 TO NODE     31.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   155.40  DOWNSTREAM(FEET) =   155.00
  FLOW LENGTH(FEET) =   105.00   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.72
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      54.60
  PIPE TRAVEL TIME(MIN.) =   0.23    Tc(MIN.) =    7.68
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     31.00 =    2070.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     31.00 TO NODE     31.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     32.00 TO NODE     33.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.30  DOWNSTREAM(FEET) =    166.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.850
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.774
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        2.62      0.30      0.100    76   11.85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      8.83
  TOTAL AREA(ACRES) =      2.62   PEAK FLOW RATE(CFS) =      8.83

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     34.00 IS CODE =  61
----------------------------------------------------------------------------
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```
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =  166.00  DOWNSTREAM ELEVATION(FEET) =  165.60
  STREET LENGTH(FEET) =   485.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 25.00

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

  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
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.63
    HALFSTREET FLOOD WIDTH(FEET) =   31.53
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.09
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.69
  STREET FLOW TRAVEL TIME(MIN.) =   7.39   Tc(MIN.) =   19.24
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.859
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        4.89      0.30     0.100    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    4.89      SUBAREA RUNOFF(CFS) =   12.45
  EFFECTIVE AREA(ACRES) =      7.51    AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        7.5        PEAK FLOW RATE(CFS) =      19.12

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.67   HALFSTREET FLOOD WIDTH(FEET) =  33.42
  FLOW VELOCITY(FEET/SEC.) =  1.18   DEPTH*VELOCITY(FT*FT/SEC.) =   0.79
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  485.0 FT WITH ELEVATION-DROP =   0.4 FT, IS   14.4 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE     34.00
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     34.00 =     785.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     34.00 TO NODE     35.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    165.60  DOWNSTREAM(FEET) =    165.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =   180.00   CHANNEL SLOPE =  0.0011
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   0.020
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
```

```
  CHANNEL FLOW THRU SUBAREA(CFS) =      19.12
  FLOW VELOCITY(FEET/SEC.) =   2.96   FLOW DEPTH(FEET) =   1.28
  TRAVEL TIME(MIN.) =   1.01   Tc(MIN.) =   20.25
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     35.00 =     965.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     35.00 TO NODE     35.00 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.) =   20.25
  RAINFALL INTENSITY(INCH/HR) =   2.78
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       7.51
  TOTAL STREAM AREA(ACRES) =       7.51
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      19.12

****************************************************************************
  FLOW PROCESS FROM NODE     35.00 TO NODE     35.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   665.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.20  DOWNSTREAM(FEET) =    165.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.351
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.524
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        6.31      0.30      0.100    76   13.35
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     19.84
  TOTAL AREA(ACRES) =      6.31   PEAK FLOW RATE(CFS) =     19.84

****************************************************************************
  FLOW PROCESS FROM NODE     35.00 TO NODE     35.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.35
  RAINFALL INTENSITY(INCH/HR) =   3.52
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
```

```
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       6.31
 TOTAL STREAM AREA(ACRES) =       6.31
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      19.84

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       19.12   20.25    2.776  0.30( 0.03) 0.10       7.5      32.00
     2       19.84   13.35    3.524  0.30( 0.03) 0.10       6.3      35.00

 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       35.89   13.35    3.524  0.30( 0.03) 0.10      11.3      35.00
     2       34.71   20.25    2.776  0.30( 0.03) 0.10      13.8      32.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      35.89    Tc(MIN.) =    13.35
 EFFECTIVE AREA(ACRES) =      11.26   AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =       13.8
 LONGEST FLOWPATH FROM NODE     32.00 TO NODE     35.00 =     965.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     35.00 TO NODE     31.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   159.00  DOWNSTREAM(FEET) =   155.00
 FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) =  20.31
 PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
 GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      35.89
 PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =   13.39
 LONGEST FLOWPATH FROM NODE     32.00 TO NODE     31.00 =    1015.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     31.00 TO NODE     31.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       35.89   13.39    3.518  0.30( 0.03) 0.10      11.3      35.00
     2       34.71   20.29    2.773  0.30( 0.03) 0.10      13.8      32.00
```

```
 LONGEST FLOWPATH FROM NODE     32.00 TO NODE     31.00 =    1015.00 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       54.60    7.68    4.837  0.30( 0.03) 0.10      11.5      28.00
     2       53.64   10.96    3.946  0.30( 0.03) 0.10      13.8      14.00
     3       53.86   11.86    3.773  0.30( 0.03) 0.10      14.5      21.00
     4       53.86   11.87    3.770  0.30( 0.03) 0.10      14.6      17.00
     5       52.71   14.53    3.357  0.30( 0.03) 0.10      16.1      24.00
     6       51.56   15.29    3.260  0.30( 0.03) 0.10      16.3      18.00
     7       48.94   16.90    3.080  0.30( 0.03) 0.10      16.4      12.00
     8       43.85   20.42    2.763  0.30( 0.03) 0.10      16.5      10.00
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     31.00 =    2070.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       82.98    7.68    4.837  0.30( 0.03) 0.10      17.9      28.00
     2       86.62   10.96    3.946  0.30( 0.03) 0.10      23.0      14.00
     3       87.95   11.86    3.773  0.30( 0.03) 0.10      24.5      21.00
     4       87.96   11.87    3.770  0.30( 0.03) 0.10      24.5      17.00
     5       89.09   13.39    3.518  0.30( 0.03) 0.10      26.7      35.00
     6       88.40   14.53    3.357  0.30( 0.03) 0.10      27.8      24.00
     7       87.13   15.29    3.260  0.30( 0.03) 0.10      28.2      18.00
     8       84.23   16.90    3.080  0.30( 0.03) 0.10      29.0      12.00
     9       78.74   20.29    2.773  0.30( 0.03) 0.10      30.3      32.00
    10       78.44   20.42    2.763  0.30( 0.03) 0.10      30.3      10.00
   TOTAL AREA(ACRES) =        30.3

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       89.09  Tc(MIN.) =   13.392
 EFFECTIVE AREA(ACRES) =     26.71  AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =       30.3
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     31.00 =    2070.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     31.00 TO NODE     36.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   155.00  DOWNSTREAM(FEET) =   153.80
 FLOW LENGTH(FEET) =   265.00   MANNING'S N =  0.013
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) =   9.26
 PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
 GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      89.09
 PIPE TRAVEL TIME(MIN.) =   0.48    Tc(MIN.) =   13.87
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     36.00 =    2335.00 FEET.

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

```
 FLOW PROCESS FROM NODE     36.00 TO NODE     36.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   13.87
 RAINFALL INTENSITY(INCH/HR) =   3.45
 AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =      26.71
 TOTAL STREAM AREA(ACRES) =      30.32
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      89.09

****************************************************************************
 FLOW PROCESS FROM NODE     37.00 TO NODE     38.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   325.00
 ELEVATION DATA: UPSTREAM(FEET) =    169.50  DOWNSTREAM(FEET) =    168.00

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.011
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.415
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 COMMERCIAL                 B        1.65      0.30     0.100    76    9.01
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =      6.51
 TOTAL AREA(ACRES) =      1.65   PEAK FLOW RATE(CFS) =      6.51

****************************************************************************
 FLOW PROCESS FROM NODE     38.00 TO NODE     36.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   159.00  DOWNSTREAM(FEET) =   153.80
 FLOW LENGTH(FEET) =    70.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  12.87
 GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       6.51
 PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =    9.10
 LONGEST FLOWPATH FROM NODE     37.00 TO NODE     36.00 =     395.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     36.00 TO NODE     36.00 IS CODE =   1
----------------------------------------------------------------------------
```

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

TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 9.10
RAINFALL INTENSITY(INCH/HR) = 4.39
AREA-AVERAGED Fm(INCH/HR) = 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.10
EFFECTIVE STREAM AREA(ACRES) = 1.65
TOTAL STREAM AREA(ACRES) = 1.65
PEAK FLOW RATE(CFS) AT CONFLUENCE = 6.51

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	82.98	8.20	4.662	0.30(0.03)	0.10	17.9	28.00
1	86.62	11.45	3.848	0.30(0.03)	0.10	23.0	14.00
1	87.95	12.34	3.687	0.30(0.03)	0.10	24.5	21.00
1	87.96	12.35	3.685	0.30(0.03)	0.10	24.5	17.00
1	89.09	13.87	3.448	0.30(0.03)	0.10	26.7	35.00
1	88.40	15.01	3.295	0.30(0.03)	0.10	27.8	24.00
1	87.13	15.78	3.202	0.30(0.03)	0.10	28.2	18.00
1	84.23	17.40	3.028	0.30(0.03)	0.10	29.0	12.00
1	78.74	20.83	2.731	0.30(0.03)	0.10	30.3	32.00
1	78.44	20.96	2.722	0.30(0.03)	0.10	30.3	10.00
2	6.51	9.10	4.390	0.30(0.03)	0.10	1.6	37.00

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	89.20	8.20	4.662	0.30(0.03)	0.10	19.4	28.00
2	90.50	9.10	4.390	0.30(0.03)	0.10	21.0	37.00
3	92.32	11.45	3.848	0.30(0.03)	0.10	24.6	14.00
4	93.41	12.34	3.687	0.30(0.03)	0.10	26.2	21.00
5	93.42	12.35	3.685	0.30(0.03)	0.10	26.2	17.00
6	94.19	13.87	3.448	0.30(0.03)	0.10	28.4	35.00
7	93.28	15.01	3.295	0.30(0.03)	0.10	29.5	24.00
8	91.87	15.78	3.202	0.30(0.03)	0.10	29.9	18.00
9	88.71	17.40	3.028	0.30(0.03)	0.10	30.6	12.00
10	82.77	20.83	2.731	0.30(0.03)	0.10	32.0	32.00
11	82.46	20.96	2.722	0.30(0.03)	0.10	32.0	10.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 94.19 Tc(MIN.) = 13.87
EFFECTIVE AREA(ACRES) = 28.36 AREA-AVERAGED Fm(INCH/HR) = 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 32.0
LONGEST FLOWPATH FROM NODE 10.00 TO NODE 36.00 = 2335.00 FEET.

```
****************************************************************************
  FLOW PROCESS FROM NODE     36.00 TO NODE     39.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   153.80  DOWNSTREAM(FEET) =   152.80
  FLOW LENGTH(FEET) =   230.00   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.79
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      94.19
  PIPE TRAVEL TIME(MIN.) =   0.39    Tc(MIN.) =   14.26
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     39.00 =    2565.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     39.00 TO NODE     39.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.26
  RAINFALL INTENSITY(INCH/HR) =   3.39
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =      28.36
  TOTAL STREAM AREA(ACRES) =      31.97
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      94.19

****************************************************************************
  FLOW PROCESS FROM NODE     40.00 TO NODE     39.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   320.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.40  DOWNSTREAM(FEET) =    167.20

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.359
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.523
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        0.48      0.30      0.100    76   13.36
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      1.51
  TOTAL AREA(ACRES) =      0.48   PEAK FLOW RATE(CFS) =      1.51

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

```
 FLOW PROCESS FROM NODE     39.00 TO NODE     39.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   13.36
 RAINFALL INTENSITY(INCH/HR) =   3.52
 AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       0.48
 TOTAL STREAM AREA(ACRES) =       0.48
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.51

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)      Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       89.20    8.61    4.532  0.30( 0.03) 0.10      19.4      28.00
     1       90.50    9.51    4.281  0.30( 0.03) 0.10      21.0      37.00
     1       92.32   11.85    3.773  0.30( 0.03) 0.10      24.6      14.00
     1       93.41   12.73    3.621  0.30( 0.03) 0.10      26.2      21.00
     1       93.42   12.75    3.619  0.30( 0.03) 0.10      26.2      17.00
     1       94.19   14.26    3.394  0.30( 0.03) 0.10      28.4      35.00
     1       93.28   15.41    3.247  0.30( 0.03) 0.10      29.5      24.00
     1       91.87   16.18    3.156  0.30( 0.03) 0.10      29.9      18.00
     1       88.71   17.82    2.987  0.30( 0.03) 0.10      30.6      12.00
     1       82.77   21.28    2.698  0.30( 0.03) 0.10      32.0      32.00
     1       82.46   21.41    2.689  0.30( 0.03) 0.10      32.0      10.00
     2        1.51   13.36    3.523  0.30( 0.03) 0.10       0.5      40.00

 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       90.46    8.61    4.532  0.30( 0.03) 0.10      19.7      28.00
     2       91.81    9.51    4.281  0.30( 0.03) 0.10      21.3      37.00
     3       93.75   11.85    3.773  0.30( 0.03) 0.10      25.1      14.00
     4       94.89   12.73    3.621  0.30( 0.03) 0.10      26.6      21.00
     5       94.90   12.75    3.619  0.30( 0.03) 0.10      26.6      17.00
     6       95.24   13.36    3.523  0.30( 0.03) 0.10      27.5      40.00
     7       95.65   14.26    3.394  0.30( 0.03) 0.10      28.8      35.00
     8       94.67   15.41    3.247  0.30( 0.03) 0.10      29.9      24.00
     9       93.22   16.18    3.156  0.30( 0.03) 0.10      30.4      18.00
    10       89.99   17.82    2.987  0.30( 0.03) 0.10      31.1      12.00
    11       83.93   21.28    2.698  0.30( 0.03) 0.10      32.4      32.00
    12       83.61   21.41    2.689  0.30( 0.03) 0.10      32.5      10.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      95.65    Tc(MIN.) =    14.26
 EFFECTIVE AREA(ACRES) =      28.84   AREA-AVERAGED Fm(INCH/HR) =  0.03
```

```
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =       32.5
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     39.00 =    2565.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     39.00 TO NODE     41.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   152.80  DOWNSTREAM(FEET) =   152.00
 FLOW LENGTH(FEET) =   210.00   MANNING'S N =  0.013
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.61
 PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
 GIVEN PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      95.65
 PIPE TRAVEL TIME(MIN.) =   0.46    Tc(MIN.) =   14.72
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     41.00 =    2775.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     41.00 TO NODE     41.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   14.72
 RAINFALL INTENSITY(INCH/HR) =   3.33
 AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =      28.84
 TOTAL STREAM AREA(ACRES) =      32.45
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      95.65

****************************************************************************
 FLOW PROCESS FROM NODE     42.00 TO NODE     41.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   230.00
 ELEVATION DATA: UPSTREAM(FEET) =    166.00  DOWNSTREAM(FEET) =    163.20

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.464
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.341
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 COMMERCIAL                 B        0.66      0.30      0.100    76    6.46
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
```

```
  SUBAREA RUNOFF(CFS) =      3.15
  TOTAL AREA(ACRES) =      0.66   PEAK FLOW RATE(CFS) =      3.15

****************************************************************************
  FLOW PROCESS FROM NODE     41.00 TO NODE     41.00 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.) =    6.46
  RAINFALL INTENSITY(INCH/HR) =   5.34
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       0.66
  TOTAL STREAM AREA(ACRES) =       0.66
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       3.15

  ** CONFLUENCE DATA **
   STREAM       Q      Tc    Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1       90.46    9.09    4.392  0.30( 0.03) 0.10       19.7      28.00
      1       91.81    9.99    4.162  0.30( 0.03) 0.10       21.3      37.00
      1       93.75   12.32    3.690  0.30( 0.03) 0.10       25.1      14.00
      1       94.89   13.20    3.548  0.30( 0.03) 0.10       26.6      21.00
      1       94.90   13.21    3.546  0.30( 0.03) 0.10       26.6      17.00
      1       95.24   13.82    3.455  0.30( 0.03) 0.10       27.5      40.00
      1       95.65   14.72    3.333  0.30( 0.03) 0.10       28.8      35.00
      1       94.67   15.87    3.192  0.30( 0.03) 0.10       29.9      24.00
      1       93.22   16.66    3.105  0.30( 0.03) 0.10       30.4      18.00
      1       89.99   18.30    2.941  0.30( 0.03) 0.10       31.1      12.00
      1       83.93   21.73    2.666  0.30( 0.03) 0.10       32.4      32.00
      1       83.61   21.85    2.658  0.30( 0.03) 0.10       32.5      10.00
      2        3.15    6.46    5.341  0.30( 0.03) 0.10        0.7      42.00

  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       81.43    6.46    5.341  0.30( 0.03) 0.10       14.7      42.00
      2       93.05    9.09    4.392  0.30( 0.03) 0.10       20.4      28.00
      3       94.26    9.99    4.162  0.30( 0.03) 0.10       22.0      37.00
      4       95.93   12.32    3.690  0.30( 0.03) 0.10       25.7      14.00
      5       96.98   13.20    3.548  0.30( 0.03) 0.10       27.3      21.00
      6       96.99   13.21    3.546  0.30( 0.03) 0.10       27.3      17.00
      7       97.28   13.82    3.455  0.30( 0.03) 0.10       28.2      40.00
      8       97.61   14.72    3.333  0.30( 0.03) 0.10       29.5      35.00
      9       96.54   15.87    3.192  0.30( 0.03) 0.10       30.6      24.00
     10       95.04   16.66    3.105  0.30( 0.03) 0.10       31.0      18.00
     11       91.72   18.30    2.941  0.30( 0.03) 0.10       31.8      12.00
```

```
    12       85.49   21.73    2.666  0.30( 0.03) 0.10      33.1      32.00
    13       85.17   21.85    2.658  0.30( 0.03) 0.10      33.1      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      97.61    Tc(MIN.) =    14.72
  EFFECTIVE AREA(ACRES) =      29.50   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =       33.1
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     41.00 =    2775.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     41.00 TO NODE     43.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   152.00  DOWNSTREAM(FEET) =   151.80
  FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  34.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.22
  GIVEN PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      97.61
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =   14.77
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     43.00 =    2805.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     43.00 TO NODE     43.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     44.00 TO NODE     45.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   350.00
  ELEVATION DATA: UPSTREAM(FEET) =    164.00  DOWNSTREAM(FEET) =    162.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.894
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.448
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        1.55      0.30      0.100    76    8.89
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      6.16
  TOTAL AREA(ACRES) =      1.55   PEAK FLOW RATE(CFS) =      6.16

****************************************************************************
  FLOW PROCESS FROM NODE     45.00 TO NODE     46.00 IS CODE =  51
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    162.00  DOWNSTREAM(FEET) =    161.80
  CHANNEL LENGTH THRU SUBAREA(FEET) =   165.00   CHANNEL SLOPE =  0.0012
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   0.040
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
  CHANNEL FLOW THRU SUBAREA(CFS) =       6.16
  FLOW VELOCITY(FEET/SEC.) =   2.33   FLOW DEPTH(FEET) =   0.87
  TRAVEL TIME(MIN.) =   1.18   Tc(MIN.) =   10.08
  LONGEST FLOWPATH FROM NODE     44.00 TO NODE     46.00 =     515.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     46.00 TO NODE     46.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.08
  RAINFALL INTENSITY(INCH/HR) =   4.14
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       1.55
  TOTAL STREAM AREA(ACRES) =       1.55
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       6.16

****************************************************************************
  FLOW PROCESS FROM NODE     47.00 TO NODE     46.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   285.00
  ELEVATION DATA: UPSTREAM(FEET) =    165.00  DOWNSTREAM(FEET) =    161.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.157
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.038
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        1.23      0.30      0.100    76    7.16
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      5.54
  TOTAL AREA(ACRES) =      1.23   PEAK FLOW RATE(CFS) =      5.54

****************************************************************************
  FLOW PROCESS FROM NODE     46.00 TO NODE     46.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```

```
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.16
  RAINFALL INTENSITY(INCH/HR) =   5.04
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       1.23
  TOTAL STREAM AREA(ACRES) =       1.23
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       5.54

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        6.16   10.08    4.141  0.30( 0.03) 0.10       1.5      44.00
      2        5.54    7.16    5.038  0.30( 0.03) 0.10       1.2      47.00

  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       10.88    7.16    5.038  0.30( 0.03) 0.10       2.3      47.00
      2       10.71   10.08    4.141  0.30( 0.03) 0.10       2.8      44.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      10.88    Tc(MIN.) =     7.16
  EFFECTIVE AREA(ACRES) =       2.33   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        2.8
  LONGEST FLOWPATH FROM NODE     44.00 TO NODE     46.00 =     515.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     46.00 TO NODE     43.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   157.00  DOWNSTREAM(FEET) =   151.80
  FLOW LENGTH(FEET) =   115.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.32
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.88
  PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =    7.31
  LONGEST FLOWPATH FROM NODE     44.00 TO NODE     43.00 =     630.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     43.00 TO NODE     43.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
```

==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10.88	7.31	4.976	0.30(0.03)	0.10	2.3	47.00
2	10.71	10.23	4.105	0.30(0.03)	0.10	2.8	44.00

LONGEST FLOWPATH FROM NODE 44.00 TO NODE 43.00 = 630.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	81.43	6.51	5.317	0.30(0.03)	0.10	14.7	42.00
2	93.05	9.14	4.378	0.30(0.03)	0.10	20.4	28.00
3	94.26	10.04	4.150	0.30(0.03)	0.10	22.0	37.00
4	95.93	12.37	3.682	0.30(0.03)	0.10	25.7	14.00
5	96.98	13.25	3.540	0.30(0.03)	0.10	27.3	21.00
6	96.99	13.26	3.539	0.30(0.03)	0.10	27.3	17.00
7	97.28	13.87	3.448	0.30(0.03)	0.10	28.2	40.00
8	97.61	14.77	3.326	0.30(0.03)	0.10	29.5	35.00
9	96.54	15.92	3.186	0.30(0.03)	0.10	30.6	24.00
10	95.04	16.71	3.100	0.30(0.03)	0.10	31.0	18.00
11	91.72	18.35	2.937	0.30(0.03)	0.10	31.8	12.00
12	85.49	21.78	2.663	0.30(0.03)	0.10	33.1	32.00
13	85.17	21.90	2.654	0.30(0.03)	0.10	33.1	10.00

LONGEST FLOWPATH FROM NODE 10.00 TO NODE 43.00 = 2805.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	91.79	6.51	5.317	0.30(0.03)	0.10	16.8	42.00
2	95.84	7.31	4.976	0.30(0.03)	0.10	18.8	47.00
3	103.82	9.14	4.378	0.30(0.03)	0.10	23.0	28.00
4	104.99	10.04	4.150	0.30(0.03)	0.10	24.7	37.00
5	105.12	10.23	4.105	0.30(0.03)	0.10	25.1	44.00
6	105.53	12.37	3.682	0.30(0.03)	0.10	28.5	14.00
7	106.21	13.25	3.540	0.30(0.03)	0.10	30.1	21.00
8	106.21	13.26	3.539	0.30(0.03)	0.10	30.1	17.00
9	106.26	13.87	3.448	0.30(0.03)	0.10	31.0	40.00
10	106.27	14.77	3.326	0.30(0.03)	0.10	32.3	35.00
11	104.84	15.92	3.186	0.30(0.03)	0.10	33.4	24.00
12	103.11	16.71	3.100	0.30(0.03)	0.10	33.8	18.00
13	99.36	18.35	2.937	0.30(0.03)	0.10	34.6	12.00
14	92.42	21.78	2.663	0.30(0.03)	0.10	35.9	32.00
15	92.07	21.90	2.654	0.30(0.03)	0.10	35.9	10.00

TOTAL AREA(ACRES) = 35.9

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 106.27 Tc(MIN.) = 14.769
EFFECTIVE AREA(ACRES) = 32.28 AREA-AVERAGED Fm(INCH/HR) = 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.10
TOTAL AREA(ACRES) = 35.9
LONGEST FLOWPATH FROM NODE 10.00 TO NODE 43.00 = 2805.00 FEET.

==========

END OF STUDY SUMMARY:
TOTAL AREA(ACRES) = 35.9 TC(MIN.) = 14.77
EFFECTIVE AREA(ACRES) = 32.28 AREA-AVERAGED Fm(INCH/HR)= 0.03
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.100
PEAK FLOW RATE(CFS) = 106.27

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	91.79	6.51	5.317	0.30(0.03)	0.10	16.8	42.00
2	95.84	7.31	4.976	0.30(0.03)	0.10	18.8	47.00
3	103.82	9.14	4.378	0.30(0.03)	0.10	23.0	28.00
4	104.99	10.04	4.150	0.30(0.03)	0.10	24.7	37.00
5	105.12	10.23	4.105	0.30(0.03)	0.10	25.1	44.00
6	105.53	12.37	3.682	0.30(0.03)	0.10	28.5	14.00
7	106.21	13.25	3.540	0.30(0.03)	0.10	30.1	21.00
8	106.21	13.26	3.539	0.30(0.03)	0.10	30.1	17.00
9	106.26	13.87	3.448	0.30(0.03)	0.10	31.0	40.00
10	106.27	14.77	3.326	0.30(0.03)	0.10	32.3	35.00
11	104.84	15.92	3.186	0.30(0.03)	0.10	33.4	24.00
12	103.11	16.71	3.100	0.30(0.03)	0.10	33.8	18.00
13	99.36	18.35	2.937	0.30(0.03)	0.10	34.6	12.00
14	92.42	21.78	2.663	0.30(0.03)	0.10	35.9	32.00
15	92.07	21.90	2.654	0.30(0.03)	0.10	35.9	10.00

END OF RATIONAL METHOD ANALYSIS

APPENDIX 3

PROPOSED HYDROLOGY STUDIES

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
        (c) Copyright 1983-2013 Advanced Engineering Software (aes)
            Ver. 20.0  Release Date: 06/01/2013  License ID 1654

                          Analysis prepared by:

                          FUSCOE ENGINEERING, Inc
                        16795 Von Karman Ave., #100
                             Irvine, CA 92606
                               949-474-1960
```

```
 ************************** DESCRIPTION OF STUDY **************************
* FREEMAN                                                                *
* PROPOSED CONDITION                                                     *
* 2 YEAR ANALYSIS                                                        *
 ************************************************************************

  FILE NAME: FRPR2.DAT
  TIME/DATE OF STUDY: 09:16 05/29/2017
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =    2.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) I ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)   (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   24.0     19.0    0.020/0.020/0.020   0.67    2.00 0.0313 0.167 0.0150
  2   18.0     13.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.50 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

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

```
 FLOW PROCESS FROM NODE     10.00 TO NODE     32.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   265.00
 ELEVATION DATA: UPSTREAM(FEET) =    167.50  DOWNSTREAM(FEET) =    166.30

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.337
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.688
 SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 COMMERCIAL                 B        0.15      0.30     0.100    36    8.34
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =      0.22
 TOTAL AREA(ACRES) =      0.15   PEAK FLOW RATE(CFS) =      0.22

****************************************************************************
 FLOW PROCESS FROM NODE     32.00 TO NODE     11.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  166.30  DOWNSTREAM ELEVATION(FEET) =  165.10
 STREET LENGTH(FEET) =   210.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 25.00

 DISTANCE FROM CROWN 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) =       0.30
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.20
   HALFSTREET FLOOD WIDTH(FEET) =    3.58
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.21
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.24
 STREET FLOW TRAVEL TIME(MIN.) =   2.88   Tc(MIN.) =   11.22
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.423
 SUBAREA LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B        0.12      0.30     0.100    36
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    0.12      SUBAREA RUNOFF(CFS) =    0.15
```

```
  EFFECTIVE AREA(ACRES) =      0.27    AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        0.3        PEAK FLOW RATE(CFS) =       0.34

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.21   HALFSTREET FLOOD WIDTH(FEET) =   4.00
  FLOW VELOCITY(FEET/SEC.) =  1.22   DEPTH*VELOCITY(FT*FT/SEC.) =   0.25
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     11.00 =     475.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     11.00 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.) =   11.22
  RAINFALL INTENSITY(INCH/HR) =   1.42
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       0.27
  TOTAL STREAM AREA(ACRES) =       0.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.34

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE     11.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   210.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.00  DOWNSTREAM(FEET) =    165.10

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.680
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.769
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        0.76      0.30     0.100    36    7.68
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      1.19
  TOTAL AREA(ACRES) =      0.76   PEAK FLOW RATE(CFS) =      1.19

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     11.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
```

```
 TIME OF CONCENTRATION(MIN.) =    7.68
 RAINFALL INTENSITY(INCH/HR) =   1.77
 AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       0.76
 TOTAL STREAM AREA(ACRES) =       0.76
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.19

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1        0.34   11.22    1.423  0.30( 0.03) 0.10       0.3      10.00
     2        1.19    7.68    1.769  0.30( 0.03) 0.10       0.8      12.00

 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        1.48    7.68    1.769  0.30( 0.03) 0.10       0.9      12.00
     2        1.29   11.22    1.423  0.30( 0.03) 0.10       1.0      10.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       1.48    Tc(MIN.) =     7.68
 EFFECTIVE AREA(ACRES) =       0.94   AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =        1.0
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     11.00 =     475.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     11.00 TO NODE     13.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  165.10  DOWNSTREAM ELEVATION(FEET) =  164.20
 STREET LENGTH(FEET) =   455.00   CURB HEIGHT(INCHES) =  8.0
 STREET HALFWIDTH(FEET) = 24.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  19.00
 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) =       1.67
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.39
   HALFSTREET FLOOD WIDTH(FEET) =   11.49
```

```
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.11
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.43
  STREET FLOW TRAVEL TIME(MIN.) =   6.84   Tc(MIN.) =   14.52
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.227
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        0.36      0.30     0.100    36
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.36      SUBAREA RUNOFF(CFS) =    0.39
  EFFECTIVE AREA(ACRES) =      1.30    AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        1.4        PEAK FLOW RATE(CFS) =       1.48
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.37   HALFSTREET FLOOD WIDTH(FEET) =  10.83
  FLOW VELOCITY(FEET/SEC.) =  1.09   DEPTH*VELOCITY(FT*FT/SEC.) =   0.41
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     13.00 =     930.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.52
  RAINFALL INTENSITY(INCH/HR) =   1.23
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       1.30
  TOTAL STREAM AREA(ACRES) =       1.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.48

****************************************************************************
  FLOW PROCESS FROM NODE     14.00 TO NODE     15.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   125.00
  ELEVATION DATA: UPSTREAM(FEET) =    164.60  DOWNSTREAM(FEET) =    164.20

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.616
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.928
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        0.15      0.30     0.100    36    6.62
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
```

```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.26
  TOTAL AREA(ACRES) =      0.15   PEAK FLOW RATE(CFS) =      0.26

****************************************************************************
  FLOW PROCESS FROM NODE     15.00 TO NODE     13.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   159.30  DOWNSTREAM(FEET) =   159.20
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   2.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.41
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.26
  PIPE TRAVEL TIME(MIN.) =   0.59    Tc(MIN.) =    7.21
  LONGEST FLOWPATH FROM NODE     14.00 TO NODE     13.00 =     175.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.21
  RAINFALL INTENSITY(INCH/HR) =   1.83
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       0.15
  TOTAL STREAM AREA(ACRES) =       0.15
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.26

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        1.48   14.52    1.227  0.30( 0.03) 0.10       1.3      12.00
      1        1.31   18.29    1.075  0.30( 0.03) 0.10       1.4      10.00
      2        0.26    7.21    1.835  0.30( 0.03) 0.10       0.2      14.00

  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        1.36    7.21    1.835  0.30( 0.03) 0.10       0.8      14.00
      2        1.65   14.52    1.227  0.30( 0.03) 0.10       1.5      12.00
      3        1.46   18.29    1.075  0.30( 0.03) 0.10       1.5      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
```

```
  PEAK FLOW RATE(CFS) =       1.65    Tc(MIN.) =    14.52
  EFFECTIVE AREA(ACRES) =       1.45   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        1.5
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     13.00 =     930.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     16.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   159.20  DOWNSTREAM(FEET) =   151.55
  FLOW LENGTH(FEET) =   235.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.47
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.65
  PIPE TRAVEL TIME(MIN.) =   0.61    Tc(MIN.) =   15.13
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     16.00 =    1165.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     17.00 TO NODE     18.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   150.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.90  DOWNSTREAM(FEET) =    166.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.741
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.643
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.36      0.30     0.350    36    8.74
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.50
  TOTAL AREA(ACRES) =      0.36   PEAK FLOW RATE(CFS) =      0.50

****************************************************************************
  FLOW PROCESS FROM NODE     18.00 TO NODE     19.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   153.00  DOWNSTREAM(FEET) =   151.60
  FLOW LENGTH(FEET) =    65.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   2.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.12
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.50
  PIPE TRAVEL TIME(MIN.) =   0.26    Tc(MIN.) =    9.00
  LONGEST FLOWPATH FROM NODE     17.00 TO NODE     19.00 =     215.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     19.00 TO NODE     19.00 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.) =    9.00
  RAINFALL INTENSITY(INCH/HR) =   1.62
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.36
  TOTAL STREAM AREA(ACRES) =       0.36
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.50

****************************************************************************
  FLOW PROCESS FROM NODE     20.00 TO NODE     21.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   150.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.30  DOWNSTREAM(FEET) =    166.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.359
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.685
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               A        0.50      0.40     0.350    17    8.36
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.70
  TOTAL AREA(ACRES) =      0.50   PEAK FLOW RATE(CFS) =      0.70

****************************************************************************
  FLOW PROCESS FROM NODE     21.00 TO NODE     19.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   153.00  DOWNSTREAM(FEET) =   151.60
```

```
  FLOW LENGTH(FEET) =    45.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   2.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.17
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.70
  PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =    8.50
  LONGEST FLOWPATH FROM NODE     20.00 TO NODE     19.00 =     195.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     19.00 TO NODE     19.00 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.) =    8.50
  RAINFALL INTENSITY(INCH/HR) =   1.67
  AREA-AVERAGED Fm(INCH/HR) =  0.14
  AREA-AVERAGED Fp(INCH/HR) =  0.40
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.50
  TOTAL STREAM AREA(ACRES) =       0.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.70

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        0.50    9.00    1.615  0.30( 0.11) 0.35       0.4      17.00
      2        0.70    8.50    1.669  0.40( 0.14) 0.35       0.5      20.00

  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        1.18    8.50    1.669  0.36( 0.13) 0.35       0.8      20.00
      2        1.17    9.00    1.615  0.36( 0.13) 0.35       0.9      17.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       1.18    Tc(MIN.) =     8.50
  EFFECTIVE AREA(ACRES) =       0.84   AREA-AVERAGED Fm(INCH/HR) =  0.13
  AREA-AVERAGED Fp(INCH/HR) =  0.36  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        0.9
  LONGEST FLOWPATH FROM NODE     17.00 TO NODE     19.00 =     215.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     19.00 TO NODE     19.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    8.50
```

```
*   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.669
SUBAREA LOSS RATE DATA(AMC  I ):
 DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
CONDOMINIUMS               B        0.42      0.30     0.350    36
SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
SUBAREA AREA(ACRES) =    0.42      SUBAREA RUNOFF(CFS) =    0.59
EFFECTIVE AREA(ACRES) =      1.26   AREA-AVERAGED Fm(INCH/HR) =  0.12
AREA-AVERAGED Fp(INCH/HR) =  0.34  AREA-AVERAGED Ap =  0.35
TOTAL AREA(ACRES) =        1.3       PEAK FLOW RATE(CFS) =       1.76

****************************************************************************
FLOW PROCESS FROM NODE     19.00 TO NODE     16.00 IS CODE =  41
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =   151.60  DOWNSTREAM(FEET) =   151.55
FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.013
DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.1 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =   2.26
GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =       1.76
PIPE TRAVEL TIME(MIN.) =   0.22    Tc(MIN.) =    8.73
LONGEST FLOWPATH FROM NODE     17.00 TO NODE     16.00 =     245.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 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        1.76    8.73    1.644  0.34( 0.12) 0.35       1.3      20.00
    2        1.72    9.23    1.593  0.34( 0.12) 0.35       1.3      17.00
LONGEST FLOWPATH FROM NODE     17.00 TO NODE     16.00 =     245.00 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        1.36    7.85    1.747  0.30( 0.03) 0.10       0.8      14.00
    2        1.65   15.13    1.199  0.30( 0.03) 0.10       1.5      12.00
    3        1.46   18.92    1.055  0.30( 0.03) 0.10       1.5      10.00
LONGEST FLOWPATH FROM NODE     10.00 TO NODE     16.00 =    1165.00 FEET.

** PEAK FLOW RATE TABLE **
 STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
 NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
    1        3.05    7.85    1.747  0.33( 0.08) 0.25       1.9      14.00
    2        3.15    8.73    1.644  0.33( 0.08) 0.25       2.1      20.00
    3        3.14    9.23    1.593  0.33( 0.08) 0.25       2.2      17.00
```

```
      4        2.91   15.13    1.199  0.33( 0.07) 0.22       2.7      12.00
      5        2.55   18.92    1.055  0.33( 0.07) 0.21       2.8      10.00
    TOTAL AREA(ACRES) =         2.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =        3.15  Tc(MIN.) =    8.725
  EFFECTIVE AREA(ACRES) =      2.14  AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.33  AREA-AVERAGED Ap =  0.25
  TOTAL AREA(ACRES) =        2.8
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     16.00 =    1165.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     22.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   151.55  DOWNSTREAM(FEET) =   151.30
  FLOW LENGTH(FEET) =   115.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.88
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.15
  PIPE TRAVEL TIME(MIN.) =   0.66    Tc(MIN.) =    9.39
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     22.00 =    1280.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     22.00 TO NODE     22.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    9.39
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.577
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  CONDOMINIUMS               A        0.31      0.40     0.350    17
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA AREA(ACRES) =    0.31      SUBAREA RUNOFF(CFS) =    0.40
  EFFECTIVE AREA(ACRES) =      2.45   AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.34  AREA-AVERAGED Ap =  0.26
  TOTAL AREA(ACRES) =        3.1       PEAK FLOW RATE(CFS) =       3.27

****************************************************************************
  FLOW PROCESS FROM NODE     22.00 TO NODE     22.00 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.) =    9.39
  RAINFALL INTENSITY(INCH/HR) =   1.58
  AREA-AVERAGED Fm(INCH/HR) =  0.09
```

```
 AREA-AVERAGED Fp(INCH/HR) =  0.34
 AREA-AVERAGED Ap =  0.26
 EFFECTIVE STREAM AREA(ACRES) =       2.45
 TOTAL STREAM AREA(ACRES) =       3.13
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       3.27

****************************************************************************
 FLOW PROCESS FROM NODE     23.00 TO NODE     22.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   225.00
 ELEVATION DATA: UPSTREAM(FEET) =    166.30  DOWNSTREAM(FEET) =    165.50

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.705
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.547
 SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 CONDOMINIUMS               B        0.71      0.30     0.350    36    9.70
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
 SUBAREA RUNOFF(CFS) =      0.92
 TOTAL AREA(ACRES) =      0.71   PEAK FLOW RATE(CFS) =      0.92

****************************************************************************
 FLOW PROCESS FROM NODE     22.00 TO NODE     22.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.70
 RAINFALL INTENSITY(INCH/HR) =   1.55
 AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.35
 EFFECTIVE STREAM AREA(ACRES) =       0.71
 TOTAL STREAM AREA(ACRES) =       0.71
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.92

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        3.18    8.52    1.667  0.35( 0.09) 0.26       2.2      14.00
     1        3.27    9.39    1.577  0.34( 0.09) 0.26       2.4      20.00
     1        3.26    9.89    1.530  0.34( 0.09) 0.26       2.5      17.00
     1        2.99   15.83    1.168  0.34( 0.08) 0.23       3.0      12.00
     1        2.69   19.63    1.033  0.34( 0.08) 0.23       3.1      10.00
     2        0.92    9.70    1.547  0.30( 0.11) 0.35       0.7      23.00
```

```
  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        4.06    8.52    1.667  0.33( 0.09) 0.28       2.9      14.00
      2        4.18    9.39    1.577  0.33( 0.09) 0.28       3.1      20.00
      3        4.19    9.70    1.547  0.33( 0.09) 0.28       3.2      23.00
      4        4.17    9.89    1.530  0.33( 0.09) 0.28       3.2      17.00
      5        3.67   15.83    1.168  0.33( 0.08) 0.25       3.8      12.00
      6        3.28   19.63    1.033  0.33( 0.08) 0.25       3.8      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       4.19    Tc(MIN.) =     9.70
  EFFECTIVE AREA(ACRES) =       3.20   AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.33  AREA-AVERAGED Ap =  0.28
  TOTAL AREA(ACRES) =        3.8
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     22.00 =    1280.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     22.00 TO NODE     22.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     24.00 TO NODE     25.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   270.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.354
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.491
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.51      0.30     0.350    36   10.35
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.64
  TOTAL AREA(ACRES) =      0.51   PEAK FLOW RATE(CFS) =      0.64

****************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE     25.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
```

```
  TIME OF CONCENTRATION(MIN.) =   10.35
  RAINFALL INTENSITY(INCH/HR) =   1.49
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.51
  TOTAL STREAM AREA(ACRES) =       0.51
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.64

****************************************************************************
  FLOW PROCESS FROM NODE     26.00 TO NODE     25.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   155.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.422
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.805
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.30      0.30     0.350    36    7.42
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.46
  TOTAL AREA(ACRES) =      0.30   PEAK FLOW RATE(CFS) =      0.46

****************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE     25.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.42
  RAINFALL INTENSITY(INCH/HR) =   1.80
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.30
  TOTAL STREAM AREA(ACRES) =       0.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.46

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        0.64   10.35    1.491  0.30( 0.11) 0.35       0.5      24.00
      2        0.46    7.42    1.805  0.30( 0.10) 0.35       0.3      26.00

  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        1.02    7.42    1.805  0.30( 0.10) 0.35       0.7      26.00
      2        1.01   10.35    1.491  0.30( 0.11) 0.35       0.8      24.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       1.02    Tc(MIN.) =     7.42
  EFFECTIVE AREA(ACRES) =       0.67   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        0.8
  LONGEST FLOWPATH FROM NODE     24.00 TO NODE     25.00 =     270.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE     28.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   161.00  DOWNSTREAM(FEET) =   158.00
  FLOW LENGTH(FEET) =   175.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   3.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.65
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.02
  PIPE TRAVEL TIME(MIN.) =   0.63    Tc(MIN.) =    8.05
  LONGEST FLOWPATH FROM NODE     24.00 TO NODE     28.00 =     445.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     28.00 TO NODE     28.00 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.) =    8.05
  RAINFALL INTENSITY(INCH/HR) =   1.72
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.67
  TOTAL STREAM AREA(ACRES) =       0.81
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.02

****************************************************************************
  FLOW PROCESS FROM NODE     27.00 TO NODE     28.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   180.00
```

```
 ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.40

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.965
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.733
 SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 CONDOMINIUMS               B        0.18      0.30     0.350    36    7.97
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
 SUBAREA RUNOFF(CFS) =      0.26
 TOTAL AREA(ACRES) =      0.18   PEAK FLOW RATE(CFS) =      0.26

****************************************************************************
 FLOW PROCESS FROM NODE     28.00 TO NODE     28.00 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.) =    7.97
 RAINFALL INTENSITY(INCH/HR) =   1.73
 AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.35
 EFFECTIVE STREAM AREA(ACRES) =       0.18
 TOTAL STREAM AREA(ACRES) =       0.18
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.26

****************************************************************************
 FLOW PROCESS FROM NODE     29.00 TO NODE     28.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   230.00
 ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.40

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.227
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.593
 SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 CONDOMINIUMS               B        0.48      0.30     0.350    36    9.23
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
 SUBAREA RUNOFF(CFS) =      0.64
 TOTAL AREA(ACRES) =      0.48   PEAK FLOW RATE(CFS) =      0.64

****************************************************************************
 FLOW PROCESS FROM NODE     28.00 TO NODE     28.00 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.) =    9.23
  RAINFALL INTENSITY(INCH/HR) =   1.59
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.48
  TOTAL STREAM AREA(ACRES) =       0.48
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.64

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        1.02    8.05    1.722  0.30( 0.10) 0.35       0.7      26.00
      1        1.01   10.98    1.441  0.30( 0.11) 0.35       0.8      24.00
      2        0.26    7.97    1.733  0.30( 0.11) 0.35       0.2      27.00
      3        0.64    9.23    1.593  0.30( 0.11) 0.35       0.5      29.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        1.88    7.97    1.733  0.30( 0.10) 0.35       1.3      27.00
      2        1.89    8.05    1.722  0.30( 0.10) 0.35       1.3      26.00
      3        1.90    9.23    1.593  0.30( 0.10) 0.35       1.4      29.00
      4        1.80   10.98    1.441  0.30( 0.11) 0.35       1.5      24.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       1.90    Tc(MIN.) =     9.23
  EFFECTIVE AREA(ACRES) =       1.38   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        1.5
  LONGEST FLOWPATH FROM NODE     24.00 TO NODE     28.00 =     445.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     28.00 TO NODE     22.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   158.00  DOWNSTREAM(FEET) =   151.30
  FLOW LENGTH(FEET) =   250.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   4.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.51
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.90
  PIPE TRAVEL TIME(MIN.) =   0.64    Tc(MIN.) =    9.87
```

```
 LONGEST FLOWPATH FROM NODE     24.00 TO NODE     22.00 =     695.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     22.00 TO NODE     22.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        1.88    8.61    1.658  0.30( 0.10) 0.35       1.3      27.00
     2        1.89    8.69    1.649  0.30( 0.10) 0.35       1.3      26.00
     3        1.90    9.87    1.532  0.30( 0.10) 0.35       1.4      29.00
     4        1.80   11.63    1.395  0.30( 0.11) 0.35       1.5      24.00
 LONGEST FLOWPATH FROM NODE     24.00 TO NODE     22.00 =     695.00 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        4.06    8.52    1.667  0.33( 0.09) 0.28       2.9      14.00
     2        4.18    9.39    1.577  0.33( 0.09) 0.28       3.1      20.00
     3        4.19    9.70    1.547  0.33( 0.09) 0.28       3.2      23.00
     4        4.17    9.89    1.530  0.33( 0.09) 0.28       3.2      17.00
     5        3.67   15.83    1.168  0.33( 0.08) 0.25       3.8      12.00
     6        3.28   19.63    1.033  0.33( 0.08) 0.25       3.8      10.00
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     22.00 =    1280.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        5.93    8.52    1.667  0.32( 0.10) 0.30       4.1      14.00
     2        5.95    8.61    1.658  0.32( 0.10) 0.30       4.1      27.00
     3        5.97    8.69    1.649  0.32( 0.10) 0.30       4.2      26.00
     4        6.08    9.39    1.577  0.32( 0.10) 0.30       4.5      20.00
     5        6.09    9.70    1.547  0.32( 0.10) 0.30       4.6      23.00
     6        6.07    9.87    1.532  0.32( 0.10) 0.30       4.6      29.00
     7        6.07    9.89    1.530  0.32( 0.10) 0.30       4.6      17.00
     8        5.83   11.63    1.395  0.32( 0.09) 0.29       4.8      24.00
     9        5.15   15.83    1.168  0.32( 0.09) 0.28       5.2      12.00
    10        4.58   19.63    1.033  0.32( 0.09) 0.28       5.3      10.00
   TOTAL AREA(ACRES) =         5.3

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =        6.09  Tc(MIN.) =    9.705
 EFFECTIVE AREA(ACRES) =      4.56  AREA-AVERAGED Fm(INCH/HR) =  0.10
 AREA-AVERAGED Fp(INCH/HR) =  0.32  AREA-AVERAGED Ap =  0.30
 TOTAL AREA(ACRES) =        5.3
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     22.00 =    1280.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     22.00 TO NODE     33.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   151.30  DOWNSTREAM(FEET) =   150.50
  FLOW LENGTH(FEET) =   425.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.16
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.09
  PIPE TRAVEL TIME(MIN.) =   2.24    Tc(MIN.) =   11.95
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     33.00 =    1705.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE     31.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   150.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.277
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.825
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.29      0.30      0.350    36    7.28
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.45
  TOTAL AREA(ACRES) =      0.29   PEAK FLOW RATE(CFS) =      0.45

****************************************************************************
  FLOW PROCESS FROM NODE     31.00 TO NODE     31.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    7.28
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.825
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  CONDOMINIUMS               B        0.65      0.30      0.350    36
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA AREA(ACRES) =    0.65      SUBAREA RUNOFF(CFS) =    1.01
  EFFECTIVE AREA(ACRES) =      0.94   AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
```

```
 TOTAL AREA(ACRES) =        0.9       PEAK FLOW RATE(CFS) =       1.46

****************************************************************************
 FLOW PROCESS FROM NODE     31.00 TO NODE     33.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   157.00  DOWNSTREAM(FEET) =   150.50
 FLOW LENGTH(FEET) =   380.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   4.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.15
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.46
 PIPE TRAVEL TIME(MIN.) =   1.23    Tc(MIN.) =    8.51
 LONGEST FLOWPATH FROM NODE     30.00 TO NODE     33.00 =     530.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 3 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        1.46    8.51    1.669  0.30( 0.11) 0.35       0.9      30.00
 LONGEST FLOWPATH FROM NODE     30.00 TO NODE     33.00 =     530.00 FEET.

 ** MEMORY BANK #  3 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        5.93   10.77    1.457  0.32( 0.10) 0.30       4.1      14.00
     2        5.95   10.85    1.451  0.32( 0.10) 0.30       4.1      27.00
     3        5.97   10.94    1.444  0.32( 0.10) 0.30       4.2      26.00
     4        6.08   11.63    1.394  0.32( 0.10) 0.30       4.5      20.00
     5        6.09   11.95    1.373  0.32( 0.10) 0.30       4.6      23.00
     6        6.07   12.11    1.362  0.32( 0.10) 0.30       4.6      29.00
     7        6.07   12.14    1.361  0.32( 0.10) 0.30       4.6      17.00
     8        5.83   13.88    1.260  0.32( 0.09) 0.29       4.8      24.00
     9        5.15   18.14    1.080  0.32( 0.09) 0.28       5.2      12.00
    10        4.58   21.99    0.967  0.32( 0.09) 0.28       5.3      10.00
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     33.00 =    1705.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        6.87    8.51    1.669  0.32( 0.10) 0.31       4.2      30.00
     2        7.19   10.77    1.457  0.32( 0.10) 0.31       5.0      14.00
     3        7.21   10.85    1.451  0.32( 0.10) 0.31       5.1      27.00
     4        7.22   10.94    1.444  0.32( 0.10) 0.31       5.1      26.00
     5        7.28   11.63    1.394  0.32( 0.10) 0.31       5.4      20.00
     6        7.27   11.95    1.373  0.32( 0.10) 0.31       5.5      23.00
```

```
      7        7.24   12.11    1.362  0.32( 0.10) 0.31       5.5      29.00
      8        7.24   12.14    1.361  0.32( 0.10) 0.31       5.5      17.00
      9        6.90   13.88    1.260  0.32( 0.10) 0.30       5.8      24.00
     10        6.06   18.14    1.080  0.32( 0.09) 0.29       6.2      12.00
     11        5.38   21.99    0.967  0.32( 0.09) 0.29       6.2      10.00
    TOTAL AREA(ACRES) =         6.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =        7.28  Tc(MIN.) =   11.635
  EFFECTIVE AREA(ACRES) =      5.41  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.32  AREA-AVERAGED Ap =  0.31
  TOTAL AREA(ACRES) =        6.2
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     33.00 =    1705.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     22.00 TO NODE     22.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  5
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.63
  RAINFALL INTENSITY(INCH/HR) =   1.39
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.32
  AREA-AVERAGED Ap =  0.31
  EFFECTIVE STREAM AREA(ACRES) =       5.41
  TOTAL STREAM AREA(ACRES) =       6.25
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       7.28

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE     33.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   185.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.60  DOWNSTREAM(FEET) =    166.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.141
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.601
```

```
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.67      0.30     0.350    36    9.14
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.90
  TOTAL AREA(ACRES) =      0.67   PEAK FLOW RATE(CFS) =      0.90

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  5
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.14
  RAINFALL INTENSITY(INCH/HR) =   1.60
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.67
  TOTAL STREAM AREA(ACRES) =       0.67
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.90

****************************************************************************
  FLOW PROCESS FROM NODE     34.00 TO NODE     35.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   180.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.20  DOWNSTREAM(FEET) =    166.10

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.867
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.316
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.50      0.30     0.350    36   12.87
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.54
  TOTAL AREA(ACRES) =      0.50   PEAK FLOW RATE(CFS) =      0.54

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  5
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.87
```

```
  RAINFALL INTENSITY(INCH/HR) =   1.32
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.50
  TOTAL STREAM AREA(ACRES) =       0.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.54

****************************************************************************
  FLOW PROCESS FROM NODE     36.00 TO NODE     37.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   150.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.70  DOWNSTREAM(FEET) =    166.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.258
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.589
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.29      0.30     0.350    36    9.26
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.39
  TOTAL AREA(ACRES) =      0.29   PEAK FLOW RATE(CFS) =      0.39

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  5
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  4 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.26
  RAINFALL INTENSITY(INCH/HR) =   1.59
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.29
  TOTAL STREAM AREA(ACRES) =       0.29
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.39

****************************************************************************
  FLOW PROCESS FROM NODE     38.00 TO NODE     33.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   150.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.40  DOWNSTREAM(FEET) =    166.00
```

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.741
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.643
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp          Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.18      0.30      0.350    36    8.74
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.25
  TOTAL AREA(ACRES) =      0.18   PEAK FLOW RATE(CFS) =      0.25

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  5
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  5 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.74
  RAINFALL INTENSITY(INCH/HR) =   1.64
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.18
  TOTAL STREAM AREA(ACRES) =       0.18
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.25

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
      1        6.87    8.51    1.669  0.32( 0.10) 0.31       4.2      30.00
      1        7.19   10.77    1.457  0.32( 0.10) 0.31       5.0      14.00
      1        7.21   10.85    1.451  0.32( 0.10) 0.31       5.1      27.00
      1        7.22   10.94    1.444  0.32( 0.10) 0.31       5.1      26.00
      1        7.28   11.63    1.394  0.32( 0.10) 0.31       5.4      20.00
      1        7.27   11.95    1.373  0.32( 0.10) 0.31       5.5      23.00
      1        7.24   12.11    1.362  0.32( 0.10) 0.31       5.5      29.00
      1        7.24   12.14    1.361  0.32( 0.10) 0.31       5.5      17.00
      1        6.90   13.88    1.260  0.32( 0.10) 0.30       5.8      24.00
      1        6.06   18.14    1.080  0.32( 0.09) 0.29       6.2      12.00
      1        5.38   21.99    0.967  0.32( 0.09) 0.29       6.2      10.00
      2        0.90    9.14    1.601  0.30( 0.11) 0.35       0.7      30.00
      3        0.54   12.87    1.316  0.30( 0.11) 0.35       0.5      34.00
      4        0.39    9.26    1.589  0.30( 0.11) 0.35       0.3      36.00
      5        0.25    8.74    1.643  0.30( 0.11) 0.35       0.2      38.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  5 STREAMS.

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

```
      1        8.83    8.51    1.669  0.31( 0.10) 0.32       5.6      30.00
      2        8.89    8.74    1.643  0.31( 0.10) 0.32       5.7      38.00
      3        8.97    9.14    1.601  0.31( 0.10) 0.32       5.9      30.00
      4        8.98    9.26    1.589  0.31( 0.10) 0.32       6.0      36.00
      5        9.09   10.77    1.457  0.31( 0.10) 0.32       6.6      14.00
      6        9.10   10.85    1.451  0.31( 0.10) 0.32       6.6      27.00
      7        9.10   10.94    1.444  0.31( 0.10) 0.32       6.7      26.00
      8        9.13   11.63    1.394  0.31( 0.10) 0.32       7.0      20.00
      9        9.10   11.95    1.373  0.31( 0.10) 0.32       7.1      23.00
     10        9.07   12.11    1.362  0.31( 0.10) 0.32       7.2      29.00
     11        9.06   12.14    1.361  0.31( 0.10) 0.32       7.2      17.00
     12        8.89   12.87    1.316  0.31( 0.10) 0.32       7.3      34.00
     13        8.60   13.88    1.260  0.31( 0.10) 0.31       7.4      24.00
     14        7.50   18.14    1.080  0.31( 0.09) 0.30       7.8      12.00
     15        6.66   21.99    0.967  0.31( 0.09) 0.30       7.9      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       9.13    Tc(MIN.) =    11.63
  EFFECTIVE AREA(ACRES) =       7.00   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.31  AREA-AVERAGED Ap =  0.32
  TOTAL AREA(ACRES) =        7.9
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     33.00 =    1705.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     38.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   150.50  DOWNSTREAM(FEET) =   150.20
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  18.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.56
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.13
  PIPE TRAVEL TIME(MIN.) =   0.70    Tc(MIN.) =   12.34
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     38.00 =    1855.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     38.00 TO NODE     38.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     39.00 TO NODE     40.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  ELEVATION DATA: UPSTREAM(FEET) =    168.00  DOWNSTREAM(FEET) =    166.90

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

```
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.822
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.453
 SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 CONDOMINIUMS               B        0.80      0.30     0.350    36   10.82
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
 SUBAREA RUNOFF(CFS) =      0.97
 TOTAL AREA(ACRES) =      0.80   PEAK FLOW RATE(CFS) =      0.97

****************************************************************************
 FLOW PROCESS FROM NODE     40.00 TO NODE     41.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   154.00  DOWNSTREAM(FEET) =   151.10
 FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   2.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.69
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.97
 PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =   10.91
 LONGEST FLOWPATH FROM NODE     39.00 TO NODE     41.00 =     340.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     41.00 TO NODE     41.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =   10.91
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.447
 SUBAREA LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 CONDOMINIUMS               B        0.45      0.30     0.350    36
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
 SUBAREA AREA(ACRES) =    0.45      SUBAREA RUNOFF(CFS) =    0.54
 EFFECTIVE AREA(ACRES) =      1.25   AREA-AVERAGED Fm(INCH/HR) =  0.10
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
 TOTAL AREA(ACRES) =        1.2       PEAK FLOW RATE(CFS) =       1.51

****************************************************************************
 FLOW PROCESS FROM NODE     41.00 TO NODE     42.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   151.10  DOWNSTREAM(FEET) =   150.60
 FLOW LENGTH(FEET) =   270.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.0 INCHES
```

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.27
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.51
  PIPE TRAVEL TIME(MIN.) =   1.98    Tc(MIN.) =   12.89
  LONGEST FLOWPATH FROM NODE     39.00 TO NODE     42.00 =     610.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     42.00 TO NODE     42.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   12.89
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.314
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  CONDOMINIUMS               B        1.15      0.30     0.350    36
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA AREA(ACRES) =    1.15      SUBAREA RUNOFF(CFS) =    1.25
  EFFECTIVE AREA(ACRES) =      2.40   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        2.4       PEAK FLOW RATE(CFS) =       2.61

****************************************************************************
  FLOW PROCESS FROM NODE     42.00 TO NODE     42.00 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.) =   12.89
  RAINFALL INTENSITY(INCH/HR) =   1.31
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       2.40
  TOTAL STREAM AREA(ACRES) =       2.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.61

****************************************************************************
  FLOW PROCESS FROM NODE     43.00 TO NODE     44.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   180.00
  ELEVATION DATA: UPSTREAM(FEET) =    168.00  DOWNSTREAM(FEET) =    166.20

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.218
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.834
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS             B        0.44      0.30      0.350    36    7.22
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.68
  TOTAL AREA(ACRES) =      0.44   PEAK FLOW RATE(CFS) =      0.68

****************************************************************************
  FLOW PROCESS FROM NODE     44.00 TO NODE     42.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   153.00  DOWNSTREAM(FEET) =   150.60
  FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   2.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.21
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.68
  PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =    7.46
  LONGEST FLOWPATH FROM NODE     43.00 TO NODE     42.00 =     255.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     42.00 TO NODE     42.00 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.) =    7.46
  RAINFALL INTENSITY(INCH/HR) =   1.80
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.44
  TOTAL STREAM AREA(ACRES) =       0.44
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.68

****************************************************************************
  FLOW PROCESS FROM NODE     45.00 TO NODE     46.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   180.00
  ELEVATION DATA: UPSTREAM(FEET) =    168.00  DOWNSTREAM(FEET) =    166.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.390
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.809
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
```

```
  CONDOMINIUMS                B        0.45      0.30     0.350    36    7.39
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.69
  TOTAL AREA(ACRES) =      0.45   PEAK FLOW RATE(CFS) =      0.69

****************************************************************************
  FLOW PROCESS FROM NODE     46.00 TO NODE     42.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   153.00  DOWNSTREAM(FEET) =   150.60
  FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   2.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.22
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.69
  PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =    7.63
  LONGEST FLOWPATH FROM NODE     45.00 TO NODE     42.00 =     255.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     42.00 TO NODE     42.00 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.) =    7.63
  RAINFALL INTENSITY(INCH/HR) =   1.78
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.45
  TOTAL STREAM AREA(ACRES) =       0.45
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.69

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        2.61   12.89    1.314  0.30( 0.10) 0.35       2.4      39.00
      2        0.68    7.46    1.799  0.30( 0.11) 0.35       0.4      43.00
      3        0.69    7.63    1.776  0.30( 0.10) 0.35       0.4      45.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        3.49    7.46    1.799  0.30( 0.10) 0.35       2.3      43.00
      2        3.50    7.63    1.776  0.30( 0.10) 0.35       2.3      45.00
```

```
     3        3.60   12.89    1.314  0.30( 0.10) 0.35       3.3      39.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       3.60    Tc(MIN.) =    12.89
  EFFECTIVE AREA(ACRES) =       3.29   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        3.3
  LONGEST FLOWPATH FROM NODE     39.00 TO NODE     42.00 =     610.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     42.00 TO NODE     38.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   150.60  DOWNSTREAM(FEET) =   150.20
  FLOW LENGTH(FEET) =   190.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.93
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.60
  PIPE TRAVEL TIME(MIN.) =   1.08    Tc(MIN.) =   13.97
  LONGEST FLOWPATH FROM NODE     39.00 TO NODE     38.00 =     800.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     38.00 TO NODE     38.00 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        3.49    8.55    1.664  0.30( 0.10) 0.35       2.3      43.00
      2        3.50    8.72    1.645  0.30( 0.10) 0.35       2.3      45.00
      3        3.60   13.97    1.255  0.30( 0.10) 0.35       3.3      39.00
  LONGEST FLOWPATH FROM NODE     39.00 TO NODE     38.00 =     800.00 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        8.83    9.21    1.594  0.31( 0.10) 0.32       5.6      30.00
      2        8.89    9.44    1.571  0.31( 0.10) 0.32       5.7      38.00
      3        8.97    9.84    1.534  0.31( 0.10) 0.32       5.9      30.00
      4        8.98    9.96    1.524  0.31( 0.10) 0.32       6.0      36.00
      5        9.09   11.47    1.405  0.31( 0.10) 0.32       6.6      14.00
      6        9.10   11.56    1.399  0.31( 0.10) 0.32       6.6      27.00
      7        9.10   11.64    1.394  0.31( 0.10) 0.32       6.7      26.00
      8        9.13   12.34    1.348  0.31( 0.10) 0.32       7.0      20.00
      9        9.10   12.65    1.329  0.31( 0.10) 0.32       7.1      23.00
     10        9.07   12.81    1.319  0.31( 0.10) 0.32       7.2      29.00
     11        9.06   12.84    1.317  0.31( 0.10) 0.32       7.2      17.00
     12        8.89   13.57    1.276  0.31( 0.10) 0.32       7.3      34.00
     13        8.60   14.59    1.224  0.31( 0.10) 0.31       7.4      24.00
```

```
    14        7.50   18.86    1.056  0.31( 0.09) 0.30       7.8      12.00
    15        6.66   22.75    0.949  0.31( 0.09) 0.30       7.9      10.00
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     38.00 =    1855.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       12.07    8.55    1.664  0.31( 0.10) 0.33       7.4      43.00
      2       12.15    8.72    1.645  0.31( 0.10) 0.33       7.6      45.00
      3       12.35    9.21    1.594  0.31( 0.10) 0.33       8.0      30.00
      4       12.40    9.44    1.571  0.31( 0.10) 0.33       8.2      38.00
      5       12.49    9.84    1.534  0.31( 0.10) 0.33       8.4      30.00
      6       12.51    9.96    1.524  0.31( 0.10) 0.33       8.5      36.00
      7       12.64   11.47    1.405  0.31( 0.10) 0.33       9.4      14.00
      8       12.65   11.56    1.399  0.31( 0.10) 0.33       9.5      27.00
      9       12.66   11.64    1.394  0.31( 0.10) 0.33       9.5      26.00
     10       12.70   12.34    1.348  0.31( 0.10) 0.33      10.0      20.00
     11       12.67   12.65    1.329  0.31( 0.10) 0.33      10.2      23.00
     12       12.64   12.81    1.319  0.31( 0.10) 0.33      10.2      29.00
     13       12.64   12.84    1.317  0.31( 0.10) 0.33      10.2      17.00
     14       12.48   13.57    1.276  0.31( 0.10) 0.33      10.5      34.00
     15       12.38   13.97    1.255  0.31( 0.10) 0.33      10.6      39.00
     16       12.11   14.59    1.224  0.31( 0.10) 0.33      10.7      24.00
     17       10.48   18.86    1.056  0.31( 0.10) 0.32      11.1      12.00
     18        9.30   22.75    0.949  0.31( 0.10) 0.32      11.2      10.00
    TOTAL AREA(ACRES) =        11.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       12.70  Tc(MIN.) =   12.336
  EFFECTIVE AREA(ACRES) =      9.99  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.31  AREA-AVERAGED Ap =  0.33
  TOTAL AREA(ACRES) =       11.2
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     38.00 =    1855.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     38.00 TO NODE     38.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     38.00 TO NODE     47.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   150.20  DOWNSTREAM(FEET) =   149.90
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  20.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.86
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      12.70
  PIPE TRAVEL TIME(MIN.) =   0.65    Tc(MIN.) =   12.98
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     47.00 =    2005.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     47.00 TO NODE     47.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     32.00 TO NODE     48.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.30  DOWNSTREAM(FEET) =    166.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.850
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.379
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                B        2.62      0.30     0.100    36   11.85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      3.18
  TOTAL AREA(ACRES) =      2.62   PEAK FLOW RATE(CFS) =      3.18

****************************************************************************
  FLOW PROCESS FROM NODE     48.00 TO NODE     49.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  166.00  DOWNSTREAM ELEVATION(FEET) =  165.60
  STREET LENGTH(FEET) =   485.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 25.00

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

  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) =       5.32
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.47
    HALFSTREET FLOOD WIDTH(FEET) =   17.07
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    0.88
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.41
  STREET FLOW TRAVEL TIME(MIN.) =   9.21   Tc(MIN.) =   21.06
```

```
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  0.992
  SUBAREA LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        4.89      0.30     0.100    36
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    4.89      SUBAREA RUNOFF(CFS) =    4.23
  EFFECTIVE AREA(ACRES) =      7.51    AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        7.5        PEAK FLOW RATE(CFS) =       6.50

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.49   HALFSTREET FLOOD WIDTH(FEET) =  18.40
  FLOW VELOCITY(FEET/SEC.) =  0.93   DEPTH*VELOCITY(FT*FT/SEC.) =   0.46
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     49.00 =     785.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     49.00 TO NODE     50.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    165.60  DOWNSTREAM(FEET) =    165.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =   180.00   CHANNEL SLOPE =  0.0011
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   0.020
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =       6.50
  FLOW VELOCITY(FEET/SEC.) =   2.08   FLOW DEPTH(FEET) =   0.62
  TRAVEL TIME(MIN.) =   1.44   Tc(MIN.) =   22.50
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     50.00 =     965.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     50.00 TO NODE     50.00 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.) =   22.50
  RAINFALL INTENSITY(INCH/HR) =   0.95
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       7.51
  TOTAL STREAM AREA(ACRES) =       7.51
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       6.50

****************************************************************************
  FLOW PROCESS FROM NODE     50.00 TO NODE     50.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
```

```
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   665.00
 ELEVATION DATA: UPSTREAM(FEET) =    167.20  DOWNSTREAM(FEET) =    165.40

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.351
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.288
 SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 COMMERCIAL                 B        6.31      0.30     0.100    36   13.35
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =      7.15
 TOTAL AREA(ACRES) =      6.31   PEAK FLOW RATE(CFS) =      7.15

****************************************************************************
 FLOW PROCESS FROM NODE     50.00 TO NODE     50.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   13.35
 RAINFALL INTENSITY(INCH/HR) =   1.29
 AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       6.31
 TOTAL STREAM AREA(ACRES) =       6.31
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       7.15

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1        6.50   22.50    0.955  0.30( 0.03) 0.10       7.5      32.00
     2        7.15   13.35    1.288  0.30( 0.03) 0.10       6.3      50.00

 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       12.39   13.35    1.288  0.30( 0.03) 0.10      10.8      50.00
     2       11.75   22.50    0.955  0.30( 0.03) 0.10      13.8      32.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      12.39    Tc(MIN.) =    13.35
 EFFECTIVE AREA(ACRES) =      10.77   AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =       13.8
 LONGEST FLOWPATH FROM NODE     32.00 TO NODE     50.00 =     965.00 FEET.
```

```
****************************************************************************
 FLOW PROCESS FROM NODE     50.00 TO NODE     47.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   162.40  DOWNSTREAM(FEET) =   149.90
 FLOW LENGTH(FEET) =   185.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  15.0 INCH PIPE IS   9.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  14.67
 ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      12.39
 PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =   13.56
 LONGEST FLOWPATH FROM NODE     32.00 TO NODE     47.00 =    1150.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     47.00 TO NODE     47.00 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       12.39   13.56    1.277  0.30( 0.03) 0.10      10.8      50.00
     2       11.75   22.72    0.949  0.30( 0.03) 0.10      13.8      32.00
 LONGEST FLOWPATH FROM NODE     32.00 TO NODE     47.00 =    1150.00 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       12.07    9.20    1.596  0.31( 0.10) 0.33       7.4      43.00
     2       12.15    9.37    1.579  0.31( 0.10) 0.33       7.6      45.00
     3       12.35    9.86    1.533  0.31( 0.10) 0.33       8.0      30.00
     4       12.40   10.09    1.513  0.31( 0.10) 0.33       8.2      38.00
     5       12.49   10.49    1.479  0.31( 0.10) 0.33       8.4      30.00
     6       12.51   10.61    1.470  0.31( 0.10) 0.33       8.5      36.00
     7       12.64   12.12    1.362  0.31( 0.10) 0.33       9.4      14.00
     8       12.65   12.20    1.356  0.31( 0.10) 0.33       9.5      27.00
     9       12.66   12.29    1.351  0.31( 0.10) 0.33       9.5      26.00
    10       12.70   12.98    1.309  0.31( 0.10) 0.33      10.0      20.00
    11       12.67   13.30    1.291  0.31( 0.10) 0.33      10.2      23.00
    12       12.64   13.46    1.282  0.31( 0.10) 0.33      10.2      29.00
    13       12.64   13.49    1.281  0.31( 0.10) 0.33      10.2      17.00
    14       12.48   14.22    1.242  0.31( 0.10) 0.33      10.5      34.00
    15       12.38   14.62    1.223  0.31( 0.10) 0.33      10.6      39.00
    16       12.11   15.24    1.194  0.31( 0.10) 0.33      10.7      24.00
    17       10.48   19.53    1.036  0.31( 0.10) 0.32      11.1      12.00
    18        9.30   23.45    0.932  0.31( 0.10) 0.32      11.2      10.00
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     47.00 =    2005.00 FEET.

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

```
      1       22.62    9.20    1.596  0.31( 0.07) 0.22      14.7      43.00
      2       22.78    9.37    1.579  0.31( 0.07) 0.22      15.0      45.00
      3       23.21    9.86    1.533  0.31( 0.07) 0.22      15.8      30.00
      4       23.37   10.09    1.513  0.31( 0.07) 0.22      16.2      38.00
      5       23.64   10.49    1.479  0.31( 0.07) 0.22      16.8      30.00
      6       23.70   10.61    1.470  0.31( 0.07) 0.22      16.9      36.00
      7       24.47   12.12    1.362  0.31( 0.07) 0.21      19.0      14.00
      8       24.52   12.20    1.356  0.31( 0.07) 0.21      19.2      27.00
      9       24.56   12.29    1.351  0.31( 0.07) 0.21      19.3      26.00
     10       24.87   12.98    1.309  0.31( 0.07) 0.21      20.3      20.00
     11       24.96   13.30    1.291  0.31( 0.06) 0.21      20.7      23.00
     12       25.00   13.46    1.282  0.31( 0.06) 0.21      20.9      29.00
     13       25.00   13.49    1.281  0.31( 0.06) 0.21      20.9      17.00
     14       25.01   13.56    1.277  0.31( 0.06) 0.21      21.0      50.00
     15       24.82   14.22    1.242  0.31( 0.06) 0.21      21.5      34.00
     16       24.69   14.62    1.223  0.31( 0.06) 0.21      21.8      39.00
     17       24.38   15.24    1.194  0.31( 0.06) 0.21      22.0      24.00
     18       22.45   19.53    1.036  0.31( 0.06) 0.20      23.9      12.00
     19       21.27   22.72    0.949  0.31( 0.06) 0.20      25.0      32.00
     20       20.83   23.45    0.932  0.31( 0.06) 0.20      25.0      10.00
   TOTAL AREA(ACRES) =        25.0

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       25.01  Tc(MIN.) =   13.561
  EFFECTIVE AREA(ACRES) =     21.03  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.31  AREA-AVERAGED Ap =  0.22
  TOTAL AREA(ACRES) =       25.0
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     47.00 =    2005.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     47.00 TO NODE     47.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     47.00 TO NODE     47.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.56
  RAINFALL INTENSITY(INCH/HR) =   1.28
  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.31
  AREA-AVERAGED Ap =  0.21
  EFFECTIVE STREAM AREA(ACRES) =      21.03
  TOTAL STREAM AREA(ACRES) =      25.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      25.01

****************************************************************************
  FLOW PROCESS FROM NODE     51.00 TO NODE     52.00 IS CODE =  21
----------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   140.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.70  DOWNSTREAM(FEET) =    166.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.386
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.682
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS              B        0.64      0.30     0.350    36    8.39
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.91
  TOTAL AREA(ACRES) =      0.64   PEAK FLOW RATE(CFS) =      0.91

********************************************************************************
  FLOW PROCESS FROM NODE     52.00 TO NODE     47.00 IS CODE =  31
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   156.00  DOWNSTREAM(FEET) =   149.90
  FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   2.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.80
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.91
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =    8.45
  LONGEST FLOWPATH FROM NODE     51.00 TO NODE     47.00 =     180.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE     47.00 TO NODE     47.00 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.) =    8.45
  RAINFALL INTENSITY(INCH/HR) =   1.67
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.64
  TOTAL STREAM AREA(ACRES) =       0.64
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.91

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```

1	22.62	9.20	1.596	0.31(0.07)	0.22	14.7	43.00
1	22.78	9.37	1.579	0.31(0.07)	0.22	15.0	45.00
1	23.21	9.86	1.533	0.31(0.07)	0.22	15.8	30.00
1	23.37	10.09	1.513	0.31(0.07)	0.22	16.2	38.00
1	23.64	10.49	1.479	0.31(0.07)	0.22	16.8	30.00
1	23.70	10.61	1.470	0.31(0.07)	0.22	16.9	36.00
1	24.47	12.12	1.362	0.31(0.07)	0.21	19.0	14.00
1	24.52	12.20	1.356	0.31(0.07)	0.21	19.2	27.00
1	24.56	12.29	1.351	0.31(0.07)	0.21	19.3	26.00
1	24.87	12.98	1.309	0.31(0.07)	0.21	20.3	20.00
1	24.96	13.30	1.291	0.31(0.06)	0.21	20.7	23.00
1	25.00	13.46	1.282	0.31(0.06)	0.21	20.9	29.00
1	25.00	13.49	1.281	0.31(0.06)	0.21	20.9	17.00
1	25.01	13.56	1.277	0.31(0.06)	0.21	21.0	50.00
1	24.82	14.22	1.242	0.31(0.06)	0.21	21.5	34.00
1	24.69	14.62	1.223	0.31(0.06)	0.21	21.8	39.00
1	24.38	15.24	1.194	0.31(0.06)	0.21	22.0	24.00
1	22.45	19.53	1.036	0.31(0.06)	0.20	23.9	12.00
1	21.27	22.72	0.949	0.31(0.06)	0.20	25.0	32.00
1	20.83	23.45	0.932	0.31(0.06)	0.20	25.0	10.00
2	0.91	8.45	1.674	0.30(0.10)	0.35	0.6	51.00

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	22.78	8.45	1.674	0.31(0.07)	0.22	14.2	51.00
2	23.48	9.20	1.596	0.31(0.07)	0.22	15.4	43.00
3	23.64	9.37	1.579	0.31(0.07)	0.22	15.7	45.00
4	24.03	9.86	1.533	0.31(0.07)	0.22	16.4	30.00
5	24.19	10.09	1.513	0.31(0.07)	0.22	16.8	38.00
6	24.43	10.49	1.479	0.31(0.07)	0.22	17.4	30.00
7	24.49	10.61	1.470	0.31(0.07)	0.22	17.6	36.00
8	25.20	12.12	1.362	0.31(0.07)	0.22	19.7	14.00
9	25.24	12.20	1.356	0.31(0.07)	0.22	19.8	27.00
10	25.28	12.29	1.351	0.31(0.07)	0.22	19.9	26.00
11	25.57	12.98	1.309	0.31(0.07)	0.22	20.9	20.00
12	25.65	13.30	1.291	0.31(0.07)	0.22	21.3	23.00
13	25.68	13.46	1.282	0.31(0.07)	0.22	21.6	29.00
14	25.68	13.49	1.281	0.31(0.07)	0.22	21.6	17.00
15	25.69	13.56	1.277	0.31(0.07)	0.22	21.7	50.00
16	25.48	14.22	1.242	0.31(0.07)	0.21	22.1	34.00
17	25.34	14.62	1.223	0.31(0.07)	0.21	22.4	39.00
18	25.01	15.24	1.194	0.31(0.07)	0.21	22.7	24.00
19	22.99	19.53	1.036	0.31(0.06)	0.20	24.5	12.00
20	21.76	22.72	0.949	0.31(0.06)	0.20	25.6	32.00
21	21.31	23.45	0.932	0.31(0.06)	0.20	25.6	10.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 25.69 Tc(MIN.) = 13.56
EFFECTIVE AREA(ACRES) = 21.67 AREA-AVERAGED Fm(INCH/HR) = 0.07
AREA-AVERAGED Fp(INCH/HR) = 0.31 AREA-AVERAGED Ap = 0.22

```
  TOTAL AREA(ACRES) =       25.6
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     47.00 =    2005.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     47.00 TO NODE     53.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   149.80  DOWNSTREAM(FEET) =   149.70
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  29.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.60
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      25.69
  PIPE TRAVEL TIME(MIN.) =   0.46    Tc(MIN.) =   14.02
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     53.00 =    2105.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     53.00 TO NODE     53.00 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.) =   14.02
  RAINFALL INTENSITY(INCH/HR) =   1.25
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.31
  AREA-AVERAGED Ap =  0.22
  EFFECTIVE STREAM AREA(ACRES) =      21.67
  TOTAL STREAM AREA(ACRES) =      25.64
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      25.69

****************************************************************************
  FLOW PROCESS FROM NODE     38.00 TO NODE     54.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   265.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.40  DOWNSTREAM(FEET) =    165.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.340
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.415
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.80      0.30     0.350    36   11.34
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.94
  TOTAL AREA(ACRES) =      0.80   PEAK FLOW RATE(CFS) =      0.94
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     54.00 TO NODE     53.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   149.80  DOWNSTREAM(FEET) =   149.70
  FLOW LENGTH(FEET) =    70.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.80
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.94
  PIPE TRAVEL TIME(MIN.) =   0.65    Tc(MIN.) =   11.99
  LONGEST FLOWPATH FROM NODE     38.00 TO NODE     53.00 =     335.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     53.00 TO NODE     53.00 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.) =   11.99
  RAINFALL INTENSITY(INCH/HR) =   1.37
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.80
  TOTAL STREAM AREA(ACRES) =       0.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.94

****************************************************************************
  FLOW PROCESS FROM NODE     55.00 TO NODE     56.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   130.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    166.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.214
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.594
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.19      0.30      0.350    36    9.21
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.25
  TOTAL AREA(ACRES) =      0.19   PEAK FLOW RATE(CFS) =      0.25

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

```
 FLOW PROCESS FROM NODE     56.00 TO NODE     53.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   156.00  DOWNSTREAM(FEET) =   149.70
 FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   1.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.81
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.25
 PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =    9.31
 LONGEST FLOWPATH FROM NODE     55.00 TO NODE     53.00 =     170.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     53.00 TO NODE     53.00 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.) =    9.31
 RAINFALL INTENSITY(INCH/HR) =   1.58
 AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.35
 EFFECTIVE STREAM AREA(ACRES) =       0.19
 TOTAL STREAM AREA(ACRES) =       0.19
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.25

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       22.78    8.93    1.622  0.31( 0.07) 0.22      14.2      51.00
     1       23.48    9.68    1.550  0.31( 0.07) 0.22      15.4      43.00
     1       23.64    9.85    1.534  0.31( 0.07) 0.22      15.7      45.00
     1       24.03   10.34    1.492  0.31( 0.07) 0.22      16.4      30.00
     1       24.19   10.57    1.473  0.31( 0.07) 0.22      16.8      38.00
     1       24.43   10.97    1.442  0.31( 0.07) 0.22      17.4      30.00
     1       24.49   11.09    1.433  0.31( 0.07) 0.22      17.6      36.00
     1       25.20   12.60    1.332  0.31( 0.07) 0.22      19.7      14.00
     1       25.24   12.68    1.327  0.31( 0.07) 0.22      19.8      27.00
     1       25.28   12.76    1.322  0.31( 0.07) 0.22      19.9      26.00
     1       25.57   13.45    1.283  0.31( 0.07) 0.22      20.9      20.00
     1       25.65   13.76    1.266  0.31( 0.07) 0.22      21.3      23.00
     1       25.68   13.92    1.257  0.31( 0.07) 0.22      21.6      29.00
     1       25.68   13.95    1.256  0.31( 0.07) 0.22      21.6      17.00
     1       25.69   14.02    1.252  0.31( 0.07) 0.22      21.7      50.00
     1       25.48   14.68    1.220  0.31( 0.07) 0.21      22.1      34.00
     1       25.34   15.10    1.200  0.31( 0.07) 0.21      22.4      39.00
     1       25.01   15.72    1.173  0.31( 0.07) 0.21      22.7      24.00
     1       22.99   20.01    1.021  0.31( 0.06) 0.20      24.5      12.00
```

```
     1       21.76   23.20    0.938  0.31( 0.06) 0.20      25.6      32.00
     1       21.31   23.94    0.921  0.31( 0.06) 0.20      25.6      10.00
     2        0.94   11.99    1.370  0.30( 0.11) 0.35       0.8      38.00
     3        0.25    9.31    1.584  0.30( 0.11) 0.35       0.2      55.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       23.87    8.93    1.622  0.31( 0.07) 0.23      15.0      51.00
      2       24.25    9.31    1.584  0.31( 0.07) 0.23      15.6      55.00
      3       24.60    9.68    1.550  0.31( 0.07) 0.23      16.2      43.00
      4       24.76    9.85    1.534  0.31( 0.07) 0.23      16.5      45.00
      5       25.16   10.34    1.492  0.31( 0.07) 0.23      17.3      30.00
      6       25.32   10.57    1.473  0.31( 0.07) 0.23      17.7      38.00
      7       25.58   10.97    1.442  0.31( 0.07) 0.23      18.3      30.00
      8       25.64   11.09    1.433  0.31( 0.07) 0.23      18.5      36.00
      9       26.08   11.99    1.370  0.31( 0.07) 0.23      19.8      38.00
     10       26.33   12.60    1.332  0.31( 0.07) 0.22      20.7      14.00
     11       26.36   12.68    1.327  0.31( 0.07) 0.22      20.8      27.00
     12       26.40   12.76    1.322  0.31( 0.07) 0.22      20.9      26.00
     13       26.65   13.45    1.283  0.31( 0.07) 0.22      21.9      20.00
     14       26.72   13.76    1.266  0.31( 0.07) 0.22      22.3      23.00
     15       26.74   13.92    1.257  0.31( 0.07) 0.22      22.5      29.00
     16       26.74   13.95    1.256  0.31( 0.07) 0.22      22.6      17.00
     17       26.75   14.02    1.252  0.31( 0.07) 0.22      22.7      50.00
     18       26.51   14.68    1.220  0.31( 0.07) 0.22      23.1      34.00
     19       26.35   15.10    1.200  0.31( 0.07) 0.22      23.4      39.00
     20       25.99   15.72    1.173  0.31( 0.07) 0.22      23.7      24.00
     21       23.83   20.01    1.021  0.31( 0.06) 0.21      25.5      12.00
     22       22.52   23.20    0.938  0.31( 0.06) 0.21      26.6      32.00
     23       22.06   23.94    0.921  0.31( 0.06) 0.21      26.6      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      26.75    Tc(MIN.) =    14.02
  EFFECTIVE AREA(ACRES) =      22.66   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.31  AREA-AVERAGED Ap =  0.22
  TOTAL AREA(ACRES) =       26.6
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     53.00 =    2105.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     53.00 TO NODE     57.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   149.70  DOWNSTREAM(FEET) =   149.10
  FLOW LENGTH(FEET) =   280.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  26.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.81
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      26.75
```

```
  PIPE TRAVEL TIME(MIN.) =   0.97    Tc(MIN.) =   14.99
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     57.00 =    2385.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     58.00 TO NODE     57.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   240.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.60

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.853
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.534
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.46      0.30      0.350    36    9.85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.59
  TOTAL AREA(ACRES) =      0.46   PEAK FLOW RATE(CFS) =      0.59

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 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.) =    9.85
  RAINFALL INTENSITY(INCH/HR) =   1.53
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.46
  TOTAL STREAM AREA(ACRES) =       0.46
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.59

****************************************************************************
  FLOW PROCESS FROM NODE     59.00 TO NODE     57.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   265.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.80  DOWNSTREAM(FEET) =    165.80
```

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.239
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.500
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.57      0.30     0.350    36   10.24
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.72
  TOTAL AREA(ACRES) =      0.57   PEAK FLOW RATE(CFS) =      0.72

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 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.) =   10.24
  RAINFALL INTENSITY(INCH/HR) =   1.50
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.57
  TOTAL STREAM AREA(ACRES) =       0.57
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.72

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        0.59    9.85    1.534  0.30( 0.11) 0.35       0.5      58.00
      2        0.72   10.24    1.500  0.30( 0.11) 0.35       0.6      59.00

  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        1.30    9.85    1.534  0.30( 0.11) 0.35       1.0      58.00
      2        1.29   10.24    1.500  0.30( 0.11) 0.35       1.0      59.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       1.30    Tc(MIN.) =     9.85
  EFFECTIVE AREA(ACRES) =       1.01   AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        1.0
  LONGEST FLOWPATH FROM NODE     59.00 TO NODE     57.00 =     265.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 IS CODE =  11
```

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

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1.30	9.85	1.534	0.30(0.11)	0.35	1.0	58.00
2	1.29	10.24	1.500	0.30(0.11)	0.35	1.0	59.00

LONGEST FLOWPATH FROM NODE 59.00 TO NODE 57.00 = 265.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	23.87	9.92	1.527	0.31(0.07)	0.23	15.0	51.00
2	24.25	10.30	1.495	0.31(0.07)	0.23	15.6	55.00
3	24.60	10.66	1.466	0.31(0.07)	0.23	16.2	43.00
4	24.76	10.83	1.453	0.31(0.07)	0.23	16.5	45.00
5	25.16	11.32	1.416	0.31(0.07)	0.23	17.3	30.00
6	25.32	11.55	1.400	0.31(0.07)	0.23	17.7	38.00
7	25.58	11.95	1.373	0.31(0.07)	0.23	18.3	30.00
8	25.64	12.06	1.365	0.31(0.07)	0.23	18.5	36.00
9	26.08	12.96	1.310	0.31(0.07)	0.23	19.8	38.00
10	26.33	13.57	1.276	0.31(0.07)	0.22	20.7	14.00
11	26.36	13.65	1.272	0.31(0.07)	0.22	20.8	27.00
12	26.40	13.73	1.267	0.31(0.07)	0.22	20.9	26.00
13	26.65	14.42	1.233	0.31(0.07)	0.22	21.9	20.00
14	26.72	14.73	1.217	0.31(0.07)	0.22	22.3	23.00
15	26.74	14.89	1.210	0.31(0.07)	0.22	22.5	29.00
16	26.74	14.92	1.209	0.31(0.07)	0.22	22.6	17.00
17	26.75	14.99	1.205	0.31(0.07)	0.22	22.7	50.00
18	26.51	15.65	1.176	0.31(0.07)	0.22	23.1	34.00
19	26.35	16.07	1.158	0.31(0.07)	0.22	23.4	39.00
20	25.99	16.69	1.133	0.31(0.07)	0.22	23.7	24.00
21	23.83	21.03	0.993	0.31(0.06)	0.21	25.5	12.00
22	22.52	24.22	0.915	0.31(0.06)	0.21	26.6	32.00
23	22.06	24.96	0.899	0.31(0.06)	0.21	26.6	10.00

LONGEST FLOWPATH FROM NODE 10.00 TO NODE 57.00 = 2385.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25.10	9.85	1.534	0.30(0.07)	0.24	15.9	58.00
2	25.17	9.92	1.527	0.30(0.07)	0.24	16.0	51.00
3	25.48	10.24	1.500	0.30(0.07)	0.24	16.5	59.00
4	25.54	10.30	1.495	0.30(0.07)	0.24	16.6	55.00
5	25.86	10.66	1.466	0.30(0.07)	0.24	17.3	43.00
6	26.01	10.83	1.453	0.30(0.07)	0.24	17.5	45.00
7	26.38	11.32	1.416	0.30(0.07)	0.23	18.4	30.00
8	26.52	11.55	1.400	0.30(0.07)	0.23	18.7	38.00
9	26.75	11.95	1.373	0.30(0.07)	0.23	19.4	30.00
10	26.81	12.06	1.365	0.31(0.07)	0.23	19.5	36.00
11	27.19	12.96	1.310	0.31(0.07)	0.23	20.9	38.00
12	27.41	13.57	1.276	0.31(0.07)	0.23	21.7	14.00

```
    13       27.45   13.65    1.272  0.31( 0.07) 0.23      21.8      27.00
    14       27.47   13.73    1.267  0.31( 0.07) 0.23      22.0      26.00
    15       27.69   14.42    1.233  0.31( 0.07) 0.23      23.0      20.00
    16       27.75   14.73    1.217  0.31( 0.07) 0.23      23.4      23.00
    17       27.76   14.89    1.210  0.31( 0.07) 0.23      23.6      29.00
    18       27.76   14.92    1.209  0.31( 0.07) 0.23      23.6      17.00
    19       27.76   14.99    1.205  0.31( 0.07) 0.23      23.7      50.00
    20       27.50   15.65    1.176  0.31( 0.07) 0.23      24.1      34.00
    21       27.32   16.07    1.158  0.31( 0.07) 0.23      24.4      39.00
    22       26.95   16.69    1.133  0.31( 0.07) 0.22      24.7      24.00
    23       24.65   21.03    0.993  0.30( 0.07) 0.22      26.5      12.00
    24       23.27   24.22    0.915  0.30( 0.06) 0.21      27.6      32.00
    25       22.79   24.96    0.899  0.30( 0.06) 0.21      27.7      10.00
  TOTAL AREA(ACRES) =        27.7

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       27.76  Tc(MIN.) =   14.994
 EFFECTIVE AREA(ACRES) =     23.69  AREA-AVERAGED Fm(INCH/HR) =  0.07
 AREA-AVERAGED Fp(INCH/HR) =  0.31  AREA-AVERAGED Ap =  0.23
 TOTAL AREA(ACRES) =       27.7
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     57.00 =    2385.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE     60.00 TO NODE     61.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   200.00
 ELEVATION DATA: UPSTREAM(FEET) =    167.00  DOWNSTREAM(FEET) =    166.20

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.043
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.611
 SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 CONDOMINIUMS               B        0.27      0.30     0.350    36    9.04
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
 SUBAREA RUNOFF(CFS) =      0.37
 TOTAL AREA(ACRES) =      0.27   PEAK FLOW RATE(CFS) =      0.37
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     61.00 TO NODE     62.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   166.20  DOWNSTREAM(FEET) =   165.30
  FLOW LENGTH(FEET) =   210.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   3.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.12
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.37
  PIPE TRAVEL TIME(MIN.) =   1.65    Tc(MIN.) =   10.69
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     62.00 =     410.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     62.00 TO NODE     62.00 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.) =   10.69
  RAINFALL INTENSITY(INCH/HR) =   1.46
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.27
  TOTAL STREAM AREA(ACRES) =       0.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.37

****************************************************************************
  FLOW PROCESS FROM NODE     63.00 TO NODE     62.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   270.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.984
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.522
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.70      0.30     0.350    36    9.98
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.89
  TOTAL AREA(ACRES) =      0.70   PEAK FLOW RATE(CFS) =      0.89
```

```
****************************************************************************
 FLOW PROCESS FROM NODE     62.00 TO NODE     62.00 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.) =    9.98
 RAINFALL INTENSITY(INCH/HR) =   1.52
 AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.35
 EFFECTIVE STREAM AREA(ACRES) =       0.70
 TOTAL STREAM AREA(ACRES) =       0.70
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.89

****************************************************************************
 FLOW PROCESS FROM NODE     64.00 TO NODE     62.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   295.00
 ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.30

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   20.647
 *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.003
 SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 AGRICULTURAL FAIR COVER
 "PASTURE,IRRIGATED"        B        0.27      0.30     1.000    45   20.65
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =      0.17
 TOTAL AREA(ACRES) =      0.27   PEAK FLOW RATE(CFS) =      0.17

****************************************************************************
 FLOW PROCESS FROM NODE     62.00 TO NODE     62.00 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.) =   20.65
 RAINFALL INTENSITY(INCH/HR) =   1.00
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =       0.27
 TOTAL STREAM AREA(ACRES) =       0.27
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.17
```

```
 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        0.37   10.69    1.463  0.30( 0.10) 0.35       0.3      60.00
     2        0.89    9.98    1.522  0.30( 0.11) 0.35       0.7      63.00
     3        0.17   20.65    1.003  0.30( 0.30) 1.00       0.3      64.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  3 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        1.39    9.98    1.522  0.30( 0.13) 0.43       1.1      63.00
     2        1.37   10.69    1.463  0.30( 0.13) 0.43       1.1      60.00
     3        0.98   20.65    1.003  0.30( 0.15) 0.49       1.2      64.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       1.39    Tc(MIN.) =     9.98
 EFFECTIVE AREA(ACRES) =       1.08   AREA-AVERAGED Fm(INCH/HR) =  0.13
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.43
 TOTAL AREA(ACRES) =        1.2
 LONGEST FLOWPATH FROM NODE     60.00 TO NODE     62.00 =     410.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     62.00 TO NODE     57.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   156.00  DOWNSTREAM(FEET) =   149.10
 FLOW LENGTH(FEET) =   245.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   4.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.10
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.39
 PIPE TRAVEL TIME(MIN.) =   0.67    Tc(MIN.) =   10.65
 LONGEST FLOWPATH FROM NODE     60.00 TO NODE     57.00 =     655.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 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        1.39   10.65    1.466  0.30( 0.13) 0.43       1.1      63.00
     2        1.37   11.37    1.413  0.30( 0.13) 0.43       1.1      60.00
     3        0.98   21.39    0.983  0.30( 0.15) 0.49       1.2      64.00
 LONGEST FLOWPATH FROM NODE     60.00 TO NODE     57.00 =     655.00 FEET.
```

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25.10	9.85	1.534	0.30(0.07)	0.24	15.9	58.00
2	25.17	9.92	1.527	0.30(0.07)	0.24	16.0	51.00
3	25.48	10.24	1.500	0.30(0.07)	0.24	16.5	59.00
4	25.54	10.30	1.495	0.30(0.07)	0.24	16.6	55.00
5	25.86	10.66	1.466	0.30(0.07)	0.24	17.3	43.00
6	26.01	10.83	1.453	0.30(0.07)	0.24	17.5	45.00
7	26.38	11.32	1.416	0.30(0.07)	0.23	18.4	30.00
8	26.52	11.55	1.400	0.30(0.07)	0.23	18.7	38.00
9	26.75	11.95	1.373	0.30(0.07)	0.23	19.4	30.00
10	26.81	12.06	1.365	0.31(0.07)	0.23	19.5	36.00
11	27.19	12.96	1.310	0.31(0.07)	0.23	20.9	38.00
12	27.41	13.57	1.276	0.31(0.07)	0.23	21.7	14.00
13	27.45	13.65	1.272	0.31(0.07)	0.23	21.8	27.00
14	27.47	13.73	1.267	0.31(0.07)	0.23	22.0	26.00
15	27.69	14.42	1.233	0.31(0.07)	0.23	23.0	20.00
16	27.75	14.73	1.217	0.31(0.07)	0.23	23.4	23.00
17	27.76	14.89	1.210	0.31(0.07)	0.23	23.6	29.00
18	27.76	14.92	1.209	0.31(0.07)	0.23	23.6	17.00
19	27.76	14.99	1.205	0.31(0.07)	0.23	23.7	50.00
20	27.50	15.65	1.176	0.31(0.07)	0.23	24.1	34.00
21	27.32	16.07	1.158	0.31(0.07)	0.23	24.4	39.00
22	26.95	16.69	1.133	0.31(0.07)	0.22	24.7	24.00
23	24.65	21.03	0.993	0.30(0.07)	0.22	26.5	12.00
24	23.27	24.22	0.915	0.30(0.06)	0.21	27.6	32.00
25	22.79	24.96	0.899	0.30(0.06)	0.21	27.7	10.00

LONGEST FLOWPATH FROM NODE 10.00 TO NODE 57.00 = 2385.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	26.45	9.85	1.534	0.30(0.08)	0.25	16.9	58.00
2	26.52	9.92	1.527	0.30(0.08)	0.25	17.0	51.00
3	26.85	10.24	1.500	0.30(0.08)	0.25	17.6	59.00
4	26.91	10.30	1.495	0.30(0.08)	0.25	17.7	55.00
5	27.25	10.65	1.466	0.30(0.08)	0.25	18.3	63.00
6	27.26	10.66	1.466	0.30(0.08)	0.25	18.3	43.00
7	27.39	10.83	1.453	0.30(0.08)	0.25	18.6	45.00
8	27.75	11.32	1.416	0.30(0.07)	0.25	19.5	30.00
9	27.78	11.37	1.413	0.30(0.07)	0.25	19.5	60.00
10	27.88	11.55	1.400	0.30(0.07)	0.25	19.8	38.00
11	28.10	11.95	1.373	0.30(0.07)	0.24	20.5	30.00
12	28.15	12.06	1.365	0.30(0.07)	0.24	20.7	36.00
13	28.50	12.96	1.310	0.30(0.07)	0.24	22.0	38.00
14	28.70	13.57	1.276	0.30(0.07)	0.24	22.8	14.00
15	28.72	13.65	1.272	0.30(0.07)	0.24	23.0	27.00
16	28.75	13.73	1.267	0.30(0.07)	0.24	23.1	26.00
17	28.94	14.42	1.233	0.30(0.07)	0.24	24.1	20.00
18	28.98	14.73	1.217	0.30(0.07)	0.24	24.5	23.00
19	28.99	14.89	1.210	0.30(0.07)	0.24	24.7	29.00
20	28.99	14.92	1.209	0.30(0.07)	0.24	24.8	17.00

```
     21       28.99   14.99    1.205  0.30( 0.07) 0.24      24.8      50.00
     22       28.70   15.65    1.176  0.30( 0.07) 0.24      25.3      34.00
     23       28.51   16.07    1.158  0.30( 0.07) 0.24      25.6      39.00
     24       28.11   16.69    1.133  0.30( 0.07) 0.24      25.9      24.00
     25       25.65   21.03    0.993  0.30( 0.07) 0.23      27.7      12.00
     26       25.48   21.39    0.983  0.30( 0.07) 0.23      27.9      64.00
     27       24.17   24.22    0.915  0.30( 0.07) 0.22      28.9      32.00
     28       23.67   24.96    0.899  0.30( 0.07) 0.22      28.9      10.00
    TOTAL AREA(ACRES) =        28.9

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       28.99  Tc(MIN.) =   14.895
  EFFECTIVE AREA(ACRES) =     24.73  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.24
  TOTAL AREA(ACRES) =       28.9
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     57.00 =    2385.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.89
  RAINFALL INTENSITY(INCH/HR) =   1.21
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.24
  EFFECTIVE STREAM AREA(ACRES) =      24.73
  TOTAL STREAM AREA(ACRES) =      28.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      28.99

****************************************************************************
  FLOW PROCESS FROM NODE     65.00 TO NODE     66.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   135.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.70  DOWNSTREAM(FEET) =    166.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.205
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.703
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
```

```
  CONDOMINIUMS                B        0.19      0.30     0.350    36    8.21
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.27
  TOTAL AREA(ACRES) =      0.19   PEAK FLOW RATE(CFS) =      0.27

****************************************************************************
  FLOW PROCESS FROM NODE     66.00 TO NODE     57.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   156.00  DOWNSTREAM(FEET) =   149.10
  FLOW LENGTH(FEET) =    45.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   1.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.89
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.27
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =    8.31
  LONGEST FLOWPATH FROM NODE     65.00 TO NODE     57.00 =     180.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 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.) =    8.31
  RAINFALL INTENSITY(INCH/HR) =   1.69
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.19
  TOTAL STREAM AREA(ACRES) =       0.19
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.27

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       26.45    9.85    1.534  0.30( 0.08) 0.25      16.9      58.00
      1       26.52    9.92    1.527  0.30( 0.08) 0.25      17.0      51.00
      1       26.85   10.24    1.500  0.30( 0.08) 0.25      17.6      59.00
      1       26.91   10.30    1.495  0.30( 0.08) 0.25      17.7      55.00
      1       27.25   10.65    1.466  0.30( 0.08) 0.25      18.3      63.00
      1       27.26   10.66    1.466  0.30( 0.08) 0.25      18.3      43.00
      1       27.39   10.83    1.453  0.30( 0.08) 0.25      18.6      45.00
      1       27.75   11.32    1.416  0.30( 0.07) 0.25      19.5      30.00
      1       27.78   11.37    1.413  0.30( 0.07) 0.25      19.5      60.00
      1       27.88   11.55    1.400  0.30( 0.07) 0.25      19.8      38.00
      1       28.10   11.95    1.373  0.30( 0.07) 0.24      20.5      30.00
      1       28.15   12.06    1.365  0.30( 0.07) 0.24      20.7      36.00
```

1	28.50	12.96	1.310	0.30(0.07)	0.24	22.0	38.00
1	28.70	13.57	1.276	0.30(0.07)	0.24	22.8	14.00
1	28.72	13.65	1.272	0.30(0.07)	0.24	23.0	27.00
1	28.75	13.73	1.267	0.30(0.07)	0.24	23.1	26.00
1	28.94	14.42	1.233	0.30(0.07)	0.24	24.1	20.00
1	28.98	14.73	1.217	0.30(0.07)	0.24	24.5	23.00
1	28.99	14.89	1.210	0.30(0.07)	0.24	24.7	29.00
1	28.99	14.92	1.209	0.30(0.07)	0.24	24.8	17.00
1	28.99	14.99	1.205	0.30(0.07)	0.24	24.8	50.00
1	28.70	15.65	1.176	0.30(0.07)	0.24	25.3	34.00
1	28.51	16.07	1.158	0.30(0.07)	0.24	25.6	39.00
1	28.11	16.69	1.133	0.30(0.07)	0.24	25.9	24.00
1	25.65	21.03	0.993	0.30(0.07)	0.23	27.7	12.00
1	25.48	21.39	0.983	0.30(0.07)	0.23	27.9	64.00
1	24.17	24.22	0.915	0.30(0.07)	0.22	28.9	32.00
1	23.67	24.96	0.899	0.30(0.07)	0.22	28.9	10.00
2	0.27	8.31	1.691	0.30(0.11)	0.35	0.2	65.00

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	25.00	8.31	1.691	0.30(0.08)	0.25	14.4	65.00
2	26.70	9.85	1.534	0.30(0.08)	0.25	17.1	58.00
3	26.77	9.92	1.527	0.30(0.08)	0.25	17.2	51.00
4	27.09	10.24	1.500	0.30(0.08)	0.25	17.8	59.00
5	27.15	10.30	1.495	0.30(0.08)	0.25	17.9	55.00
6	27.49	10.65	1.466	0.30(0.08)	0.25	18.5	63.00
7	27.49	10.66	1.466	0.30(0.08)	0.25	18.5	43.00
8	27.63	10.83	1.453	0.30(0.08)	0.25	18.8	45.00
9	27.98	11.32	1.416	0.30(0.08)	0.25	19.7	30.00
10	28.00	11.37	1.413	0.30(0.08)	0.25	19.7	60.00
11	28.11	11.55	1.400	0.30(0.08)	0.25	20.0	38.00
12	28.32	11.95	1.373	0.30(0.07)	0.25	20.7	30.00
13	28.37	12.06	1.365	0.30(0.07)	0.25	20.8	36.00
14	28.71	12.96	1.310	0.30(0.07)	0.24	22.2	38.00
15	28.90	13.57	1.276	0.30(0.07)	0.24	23.0	14.00
16	28.93	13.65	1.272	0.30(0.07)	0.24	23.2	27.00
17	28.95	13.73	1.267	0.30(0.07)	0.24	23.3	26.00
18	29.14	14.42	1.233	0.30(0.07)	0.24	24.3	20.00
19	29.18	14.73	1.217	0.30(0.07)	0.24	24.7	23.00
20	29.18	14.89	1.210	0.30(0.07)	0.24	24.9	29.00
21	29.18	14.92	1.209	0.30(0.07)	0.24	24.9	17.00
22	29.18	14.99	1.205	0.30(0.07)	0.24	25.0	50.00
23	28.88	15.65	1.176	0.30(0.07)	0.24	25.5	34.00
24	28.69	16.07	1.158	0.30(0.07)	0.24	25.8	39.00
25	28.28	16.69	1.133	0.30(0.07)	0.24	26.1	24.00
26	25.80	21.03	0.993	0.30(0.07)	0.23	27.9	12.00
27	25.63	21.39	0.983	0.30(0.07)	0.23	28.1	64.00
28	24.31	24.22	0.915	0.30(0.07)	0.22	29.1	32.00
29	23.81	24.96	0.899	0.30(0.07)	0.22	29.1	10.00

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      29.18    Tc(MIN.) =    14.89
  EFFECTIVE AREA(ACRES) =      24.92   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.24
  TOTAL AREA(ACRES) =       29.1
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     57.00 =    2385.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     67.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   149.10  DOWNSTREAM(FEET) =   148.50
  FLOW LENGTH(FEET) =   275.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  28.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.89
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      29.18
  PIPE TRAVEL TIME(MIN.) =   0.94    Tc(MIN.) =   15.83
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     67.00 =    2660.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     67.00 TO NODE     67.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     68.00 TO NODE     69.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   365.00
  ELEVATION DATA: UPSTREAM(FEET) =    168.20  DOWNSTREAM(FEET) =    167.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.404
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.410
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  APARTMENTS                 B        1.00      0.30     0.200    36   11.40
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      1.22
  TOTAL AREA(ACRES) =      1.00   PEAK FLOW RATE(CFS) =      1.22

****************************************************************************
  FLOW PROCESS FROM NODE     69.00 TO NODE     70.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   162.00  DOWNSTREAM(FEET) =   159.00
  FLOW LENGTH(FEET) =   185.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   4.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.81
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.22
  PIPE TRAVEL TIME(MIN.) =   0.64    Tc(MIN.) =   12.05
  LONGEST FLOWPATH FROM NODE     68.00 TO NODE     70.00 =     550.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     71.00 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.) =   12.05
  RAINFALL INTENSITY(INCH/HR) =   1.37
  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       1.00
  TOTAL STREAM AREA(ACRES) =       1.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.22

****************************************************************************
  FLOW PROCESS FROM NODE     71.00 TO NODE     70.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   250.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.20  DOWNSTREAM(FEET) =    166.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.688
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.464
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  APARTMENTS                B        0.66      0.30      0.200    36   10.69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      0.83
  TOTAL AREA(ACRES) =      0.66   PEAK FLOW RATE(CFS) =      0.83

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     70.00 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.) =   10.69
  RAINFALL INTENSITY(INCH/HR) =   1.46
  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       0.66
  TOTAL STREAM AREA(ACRES) =       0.66
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.83

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        1.22   12.05    1.367  0.30( 0.06) 0.20       1.0      68.00
      2        0.83   10.69    1.464  0.30( 0.06) 0.20       0.7      71.00

  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        1.99   10.69    1.464  0.30( 0.06) 0.20       1.5      71.00
      2        1.99   12.05    1.367  0.30( 0.06) 0.20       1.7      68.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       1.99    Tc(MIN.) =    10.69
  EFFECTIVE AREA(ACRES) =       1.55   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.20
  TOTAL AREA(ACRES) =        1.7
  LONGEST FLOWPATH FROM NODE     68.00 TO NODE     70.00 =     550.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     70.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     72.00 TO NODE     73.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   230.00
  ELEVATION DATA: UPSTREAM(FEET) =    168.00  DOWNSTREAM(FEET) =    166.80
```

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.161
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.709
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  APARTMENTS                 B        0.28      0.30     0.200    36    8.16
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      0.42
  TOTAL AREA(ACRES) =      0.28   PEAK FLOW RATE(CFS) =      0.42

****************************************************************************
  FLOW PROCESS FROM NODE     73.00 TO NODE     70.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   160.00  DOWNSTREAM(FEET) =   159.00
  FLOW LENGTH(FEET) =   270.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   3.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.10
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.42
  PIPE TRAVEL TIME(MIN.) =   2.14    Tc(MIN.) =   10.30
  LONGEST FLOWPATH FROM NODE     72.00 TO NODE     70.00 =     500.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     70.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.30
  RAINFALL INTENSITY(INCH/HR) =   1.49
  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       0.28
  TOTAL STREAM AREA(ACRES) =       0.28
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.42

****************************************************************************
  FLOW PROCESS FROM NODE     72.00 TO NODE     70.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   390.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.20  DOWNSTREAM(FEET) =    166.80

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

```
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.956
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.256
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  APARTMENTS                B        1.49      0.30     0.200    36   13.96
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      1.60
  TOTAL AREA(ACRES) =      1.49   PEAK FLOW RATE(CFS) =      1.60

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     70.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.96
  RAINFALL INTENSITY(INCH/HR) =   1.26
  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       1.49
  TOTAL STREAM AREA(ACRES) =       1.49
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.60

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        0.42   10.30    1.495  0.30( 0.06) 0.20       0.3      72.00
      2        1.60   13.96    1.256  0.30( 0.06) 0.20       1.5      72.00

  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        1.84   10.30    1.495  0.30( 0.06) 0.20       1.4      72.00
      2        1.95   13.96    1.256  0.30( 0.06) 0.20       1.8      72.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       1.95    Tc(MIN.) =    13.96
  EFFECTIVE AREA(ACRES) =       1.77   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.20
  TOTAL AREA(ACRES) =        1.8
  LONGEST FLOWPATH FROM NODE     72.00 TO NODE     70.00 =     500.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     70.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 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        1.84   10.30    1.495  0.30( 0.06) 0.20       1.4      72.00
      2        1.95   13.96    1.256  0.30( 0.06) 0.20       1.8      72.00
  LONGEST FLOWPATH FROM NODE     72.00 TO NODE     70.00 =     500.00 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        1.99   10.69    1.464  0.30( 0.06) 0.20       1.5      71.00
      2        1.99   12.05    1.367  0.30( 0.06) 0.20       1.7      68.00
  LONGEST FLOWPATH FROM NODE     68.00 TO NODE     70.00 =     550.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        3.80   10.30    1.495  0.30( 0.06) 0.20       2.9      72.00
      2        3.84   10.69    1.464  0.30( 0.06) 0.20       3.0      71.00
      3        3.88   12.05    1.367  0.30( 0.06) 0.20       3.2      68.00
      4        3.77   13.96    1.256  0.30( 0.06) 0.20       3.4      72.00
    TOTAL AREA(ACRES) =         3.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =        3.88  Tc(MIN.) =   12.045
  EFFECTIVE AREA(ACRES) =      3.23  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.20
  TOTAL AREA(ACRES) =        3.4
  LONGEST FLOWPATH FROM NODE     68.00 TO NODE     70.00 =     550.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     70.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     67.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   155.00  DOWNSTREAM(FEET) =   148.50
  FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   4.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.91
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.88
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =   12.07
  LONGEST FLOWPATH FROM NODE     68.00 TO NODE     67.00 =     580.00 FEET.
```

```
****************************************************************************
 FLOW PROCESS FROM NODE     67.00 TO NODE     67.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================
```

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3.80	10.33	1.492	0.30(0.06)	0.20	2.9	72.00
2	3.84	10.72	1.461	0.30(0.06)	0.20	3.0	71.00
3	3.88	12.07	1.365	0.30(0.06)	0.20	3.2	68.00
4	3.77	13.99	1.254	0.30(0.06)	0.20	3.4	72.00

LONGEST FLOWPATH FROM NODE 68.00 TO NODE 67.00 = 580.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25.00	9.27	1.588	0.30(0.08)	0.25	14.4	65.00
2	26.70	10.80	1.455	0.30(0.08)	0.25	17.1	58.00
3	26.77	10.87	1.450	0.30(0.08)	0.25	17.2	51.00
4	27.09	11.18	1.426	0.30(0.08)	0.25	17.8	59.00
5	27.15	11.24	1.422	0.30(0.08)	0.25	17.9	55.00
6	27.49	11.60	1.397	0.30(0.08)	0.25	18.5	63.00
7	27.49	11.60	1.396	0.30(0.08)	0.25	18.5	43.00
8	27.63	11.77	1.385	0.30(0.08)	0.25	18.8	45.00
9	27.98	12.26	1.353	0.30(0.08)	0.25	19.7	30.00
10	28.00	12.31	1.350	0.30(0.08)	0.25	19.7	60.00
11	28.11	12.49	1.339	0.30(0.08)	0.25	20.0	38.00
12	28.32	12.88	1.315	0.30(0.07)	0.25	20.7	30.00
13	28.37	13.00	1.308	0.30(0.07)	0.25	20.8	36.00
14	28.71	13.90	1.259	0.30(0.07)	0.24	22.2	38.00
15	28.90	14.51	1.228	0.30(0.07)	0.24	23.0	14.00
16	28.93	14.59	1.224	0.30(0.07)	0.24	23.2	27.00
17	28.95	14.67	1.220	0.30(0.07)	0.24	23.3	26.00
18	29.14	15.35	1.189	0.30(0.07)	0.24	24.3	20.00
19	29.18	15.67	1.175	0.30(0.07)	0.24	24.7	23.00
20	29.18	15.83	1.168	0.30(0.07)	0.24	24.9	29.00
21	29.18	15.86	1.167	0.30(0.07)	0.24	24.9	17.00
22	29.18	15.93	1.164	0.30(0.07)	0.24	25.0	50.00
23	28.88	16.59	1.137	0.30(0.07)	0.24	25.5	34.00
24	28.69	17.01	1.121	0.30(0.07)	0.24	25.8	39.00
25	28.28	17.63	1.098	0.30(0.07)	0.24	26.1	24.00
26	25.80	21.98	0.968	0.30(0.07)	0.23	27.9	12.00
27	25.63	22.34	0.959	0.30(0.07)	0.23	28.1	64.00
28	24.31	25.18	0.895	0.30(0.07)	0.22	29.1	32.00
29	23.81	25.95	0.880	0.30(0.07)	0.22	29.1	10.00

LONGEST FLOWPATH FROM NODE 10.00 TO NODE 67.00 = 2660.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	28.63	9.27	1.588	0.30(0.07)	0.24	17.0	65.00
2	29.98	10.33	1.492	0.30(0.07)	0.24	19.1	72.00

```
      3       30.45   10.72    1.461  0.30( 0.07) 0.24      19.9      71.00
      4       30.54   10.80    1.455  0.30( 0.07) 0.24      20.1      58.00
      5       30.61   10.87    1.450  0.30( 0.07) 0.24      20.2      51.00
      6       30.95   11.18    1.426  0.30( 0.07) 0.24      20.8      59.00
      7       31.01   11.24    1.422  0.30( 0.07) 0.24      20.9      55.00
      8       31.35   11.60    1.397  0.30( 0.07) 0.24      21.6      63.00
      9       31.36   11.60    1.396  0.30( 0.07) 0.24      21.7      43.00
     10       31.50   11.77    1.385  0.30( 0.07) 0.24      22.0      45.00
     11       31.73   12.07    1.365  0.30( 0.07) 0.24      22.6      68.00
     12       31.85   12.26    1.353  0.30( 0.07) 0.24      22.9      30.00
     13       31.87   12.31    1.350  0.30( 0.07) 0.24      23.0      60.00
     14       31.96   12.49    1.339  0.30( 0.07) 0.24      23.3      38.00
     15       32.15   12.88    1.315  0.30( 0.07) 0.24      24.0      30.00
     16       32.19   13.00    1.308  0.30( 0.07) 0.24      24.2      36.00
     17       32.49   13.90    1.259  0.30( 0.07) 0.24      25.6      38.00
     18       32.51   13.99    1.254  0.30( 0.07) 0.24      25.7      72.00
     19       32.59   14.51    1.228  0.30( 0.07) 0.24      26.5      14.00
     20       32.60   14.59    1.224  0.30( 0.07) 0.24      26.6      27.00
     21       32.62   14.67    1.220  0.30( 0.07) 0.24      26.7      26.00
     22       32.70   15.35    1.189  0.30( 0.07) 0.23      27.7      20.00
     23       32.70   15.67    1.175  0.30( 0.07) 0.23      28.1      23.00
     24       32.68   15.83    1.168  0.30( 0.07) 0.23      28.3      29.00
     25       32.68   15.86    1.167  0.30( 0.07) 0.23      28.4      17.00
     26       32.67   15.93    1.164  0.30( 0.07) 0.23      28.5      50.00
     27       32.29   16.59    1.137  0.30( 0.07) 0.23      28.9      34.00
     28       32.04   17.01    1.121  0.30( 0.07) 0.23      29.2      39.00
     29       31.56   17.63    1.098  0.30( 0.07) 0.23      29.5      24.00
     30       28.67   21.98    0.968  0.30( 0.07) 0.23      31.4      12.00
     31       28.47   22.34    0.959  0.30( 0.07) 0.23      31.5      64.00
     32       26.95   25.18    0.895  0.30( 0.07) 0.22      32.5      32.00
     33       26.40   25.95    0.880  0.30( 0.07) 0.22      32.5      10.00
   TOTAL AREA(ACRES) =        32.5

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       32.70  Tc(MIN.) =   15.354
  EFFECTIVE AREA(ACRES) =     27.72  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.23
  TOTAL AREA(ACRES) =       32.5
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     67.00 =    2660.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     67.00 TO NODE     74.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   148.50  DOWNSTREAM(FEET) =   148.00
  FLOW LENGTH(FEET) =   280.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  30.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.67
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      32.70
  PIPE TRAVEL TIME(MIN.) =   1.00    Tc(MIN.) =   16.35
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     74.00 =    2940.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     74.00 TO NODE     74.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     75.00 TO NODE     76.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   275.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.00  DOWNSTREAM(FEET) =    165.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.415
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.574
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.70      0.30     0.350    36    9.41
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.93
  TOTAL AREA(ACRES) =      0.70   PEAK FLOW RATE(CFS) =      0.93

****************************************************************************
  FLOW PROCESS FROM NODE     76.00 TO NODE     76.00 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.) =    9.41
  RAINFALL INTENSITY(INCH/HR) =   1.57
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.70
  TOTAL STREAM AREA(ACRES) =       0.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.93

****************************************************************************
  FLOW PROCESS FROM NODE     77.00 TO NODE     76.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   255.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.00  DOWNSTREAM(FEET) =    166.30

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

```
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.745
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.459
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS              B        0.51      0.30     0.350    36   10.75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.62
  TOTAL AREA(ACRES) =      0.51   PEAK FLOW RATE(CFS) =      0.62

****************************************************************************
  FLOW PROCESS FROM NODE     76.00 TO NODE     76.00 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.) =   10.75
  RAINFALL INTENSITY(INCH/HR) =   1.46
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.51
  TOTAL STREAM AREA(ACRES) =       0.51
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.62

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        0.93    9.41    1.574  0.30( 0.11) 0.35       0.7      75.00
      2        0.62   10.75    1.459  0.30( 0.11) 0.35       0.5      77.00

  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        1.52    9.41    1.574  0.30( 0.11) 0.35       1.1      75.00
      2        1.47   10.75    1.459  0.30( 0.10) 0.35       1.2      77.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       1.52    Tc(MIN.) =     9.41
  EFFECTIVE AREA(ACRES) =       1.15   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        1.2
  LONGEST FLOWPATH FROM NODE     75.00 TO NODE     76.00 =     275.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     76.00 TO NODE     79.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   154.00  DOWNSTREAM(FEET) =   152.00
  FLOW LENGTH(FEET) =   300.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.68
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.52
  PIPE TRAVEL TIME(MIN.) =   1.36    Tc(MIN.) =   10.77
  LONGEST FLOWPATH FROM NODE     75.00 TO NODE     79.00 =     575.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     79.00 TO NODE     79.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.77
  RAINFALL INTENSITY(INCH/HR) =   1.46
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       1.15
  TOTAL STREAM AREA(ACRES) =       1.21
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.52

****************************************************************************
  FLOW PROCESS FROM NODE     78.00 TO NODE     79.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   200.00
  ELEVATION DATA: UPSTREAM(FEET) =    165.90  DOWNSTREAM(FEET) =    165.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.578
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.559
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.40      0.30      0.350    36    9.58
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.52
  TOTAL AREA(ACRES) =      0.40   PEAK FLOW RATE(CFS) =      0.52

****************************************************************************
  FLOW PROCESS FROM NODE     79.00 TO NODE     79.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
```

```
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.58
 RAINFALL INTENSITY(INCH/HR) =   1.56
 AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.35
 EFFECTIVE STREAM AREA(ACRES) =       0.40
 TOTAL STREAM AREA(ACRES) =       0.40
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.52

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        1.52   10.77    1.457  0.30( 0.11) 0.35       1.1      75.00
     1        1.47   12.12    1.362  0.30( 0.10) 0.35       1.2      77.00
     2        0.52    9.58    1.559  0.30( 0.11) 0.35       0.4      78.00

 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        1.97    9.58    1.559  0.30( 0.10) 0.35       1.4      78.00
     2        2.00   10.77    1.457  0.30( 0.11) 0.35       1.5      75.00
     3        1.93   12.12    1.362  0.30( 0.10) 0.35       1.6      77.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       2.00    Tc(MIN.) =    10.77
 EFFECTIVE AREA(ACRES) =       1.55   AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
 TOTAL AREA(ACRES) =        1.6
 LONGEST FLOWPATH FROM NODE     75.00 TO NODE     79.00 =     575.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     79.00 TO NODE     74.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   152.00  DOWNSTREAM(FEET) =   148.00
 FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   3.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   9.82
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       2.00
 PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =   10.86
 LONGEST FLOWPATH FROM NODE     75.00 TO NODE     74.00 =     625.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     74.00 TO NODE     74.00 IS CODE =  11
----------------------------------------------------------------------------
```

>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	1.97	9.66	1.551	0.30(0.10)	0.35	1.4	78.00
2	2.00	10.86	1.450	0.30(0.11)	0.35	1.5	75.00
3	1.93	12.20	1.356	0.30(0.10)	0.35	1.6	77.00

LONGEST FLOWPATH FROM NODE 75.00 TO NODE 74.00 = 625.00 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	28.63	10.29	1.496	0.30(0.07)	0.24	17.0	65.00
2	29.98	11.34	1.415	0.30(0.07)	0.24	19.1	72.00
3	30.45	11.72	1.388	0.30(0.07)	0.24	19.9	71.00
4	30.54	11.81	1.382	0.30(0.07)	0.24	20.1	58.00
5	30.61	11.87	1.378	0.30(0.07)	0.24	20.2	51.00
6	30.95	12.19	1.357	0.30(0.07)	0.24	20.8	59.00
7	31.01	12.25	1.354	0.30(0.07)	0.24	20.9	55.00
8	31.35	12.60	1.332	0.30(0.07)	0.24	21.6	63.00
9	31.36	12.60	1.332	0.30(0.07)	0.24	21.7	43.00
10	31.50	12.77	1.321	0.30(0.07)	0.24	22.0	45.00
11	31.73	13.08	1.304	0.30(0.07)	0.24	22.6	68.00
12	31.85	13.26	1.293	0.30(0.07)	0.24	22.9	30.00
13	31.87	13.31	1.291	0.30(0.07)	0.24	23.0	60.00
14	31.96	13.49	1.281	0.30(0.07)	0.24	23.3	38.00
15	32.15	13.89	1.259	0.30(0.07)	0.24	24.0	30.00
16	32.19	14.00	1.253	0.30(0.07)	0.24	24.2	36.00
17	32.49	14.90	1.210	0.30(0.07)	0.24	25.6	38.00
18	32.51	14.99	1.206	0.30(0.07)	0.24	25.7	72.00
19	32.59	15.51	1.182	0.30(0.07)	0.24	26.5	14.00
20	32.60	15.59	1.179	0.30(0.07)	0.24	26.6	27.00
21	32.62	15.67	1.175	0.30(0.07)	0.24	26.7	26.00
22	32.70	16.35	1.147	0.30(0.07)	0.23	27.7	20.00
23	32.70	16.67	1.134	0.30(0.07)	0.23	28.1	23.00
24	32.68	16.83	1.128	0.30(0.07)	0.23	28.3	29.00
25	32.68	16.86	1.127	0.30(0.07)	0.23	28.4	17.00
26	32.67	16.93	1.124	0.30(0.07)	0.23	28.5	50.00
27	32.29	17.59	1.100	0.30(0.07)	0.23	28.9	34.00
28	32.04	18.01	1.085	0.30(0.07)	0.23	29.2	39.00
29	31.56	18.63	1.064	0.30(0.07)	0.23	29.5	24.00
30	28.67	22.99	0.943	0.30(0.07)	0.23	31.4	12.00
31	28.47	23.36	0.934	0.30(0.07)	0.23	31.5	64.00
32	26.95	26.23	0.874	0.30(0.07)	0.22	32.5	32.00
33	26.40	27.01	0.860	0.30(0.07)	0.22	32.5	10.00

LONGEST FLOWPATH FROM NODE 10.00 TO NODE 74.00 = 2940.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	29.91	9.66	1.551	0.30(0.08)	0.25	17.4	78.00
2	30.62	10.29	1.496	0.30(0.08)	0.25	18.5	65.00

3	31.37	10.86	1.450	0.30(0.08)	0.25	19.7	75.00
4	31.96	11.34	1.415	0.30(0.08)	0.25	20.7	72.00
5	32.40	11.72	1.388	0.30(0.08)	0.25	21.5	71.00
6	32.49	11.81	1.382	0.30(0.08)	0.25	21.6	58.00
7	32.56	11.87	1.378	0.30(0.08)	0.25	21.8	51.00
8	32.88	12.19	1.357	0.30(0.08)	0.25	22.4	59.00
9	32.89	12.20	1.356	0.30(0.08)	0.25	22.5	77.00
10	32.93	12.25	1.354	0.30(0.08)	0.25	22.6	55.00
11	33.24	12.60	1.332	0.30(0.08)	0.25	23.3	63.00
12	33.25	12.60	1.332	0.30(0.08)	0.25	23.3	43.00
13	33.37	12.77	1.321	0.30(0.08)	0.25	23.6	45.00
14	33.57	13.08	1.304	0.30(0.08)	0.25	24.2	68.00
15	33.68	13.26	1.293	0.30(0.08)	0.25	24.5	30.00
16	33.70	13.31	1.291	0.30(0.08)	0.25	24.6	60.00
17	33.77	13.49	1.281	0.30(0.08)	0.25	24.9	38.00
18	33.93	13.89	1.259	0.30(0.07)	0.25	25.6	30.00
19	33.96	14.00	1.253	0.30(0.07)	0.25	25.8	36.00
20	34.19	14.90	1.210	0.30(0.07)	0.24	27.2	38.00
21	34.20	14.99	1.206	0.30(0.07)	0.24	27.3	72.00
22	34.25	15.51	1.182	0.30(0.07)	0.24	28.1	14.00
23	34.26	15.59	1.179	0.30(0.07)	0.24	28.2	27.00
24	34.26	15.67	1.175	0.30(0.07)	0.24	28.3	26.00
25	34.31	16.35	1.147	0.30(0.07)	0.24	29.3	20.00
26	34.28	16.67	1.134	0.30(0.07)	0.24	29.8	23.00
27	34.26	16.83	1.128	0.30(0.07)	0.24	30.0	29.00
28	34.25	16.86	1.127	0.30(0.07)	0.24	30.0	17.00
29	34.24	16.93	1.124	0.30(0.07)	0.24	30.1	50.00
30	33.82	17.59	1.100	0.30(0.07)	0.24	30.5	34.00
31	33.55	18.01	1.085	0.30(0.07)	0.24	30.8	39.00
32	33.04	18.63	1.064	0.30(0.07)	0.24	31.1	24.00
33	29.96	22.99	0.943	0.30(0.07)	0.23	33.0	12.00
34	29.74	23.36	0.934	0.30(0.07)	0.23	33.1	64.00
35	28.14	26.23	0.874	0.30(0.07)	0.23	34.1	32.00
36	27.56	27.01	0.860	0.30(0.07)	0.23	34.1	10.00

TOTAL AREA(ACRES) = 34.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 34.31 Tc(MIN.) = 16.354
EFFECTIVE AREA(ACRES) = 29.33 AREA-AVERAGED Fm(INCH/HR) = 0.07
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.24
TOTAL AREA(ACRES) = 34.1
LONGEST FLOWPATH FROM NODE 10.00 TO NODE 74.00 = 2940.00 FEET.

```
****************************************************************************
 FLOW PROCESS FROM NODE     74.00 TO NODE     74.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE     74.00 TO NODE     74.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
```

```
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.35
  RAINFALL INTENSITY(INCH/HR) =   1.15
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.24
  EFFECTIVE STREAM AREA(ACRES) =      29.33
  TOTAL STREAM AREA(ACRES) =      34.13
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      34.31

****************************************************************************
  FLOW PROCESS FROM NODE     59.00 TO NODE     74.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.80  DOWNSTREAM(FEET) =    165.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.807
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.538
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.41      0.30     0.350    36    9.81
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.53
  TOTAL AREA(ACRES) =      0.41   PEAK FLOW RATE(CFS) =      0.53

****************************************************************************
  FLOW PROCESS FROM NODE     74.00 TO NODE     74.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.81
  RAINFALL INTENSITY(INCH/HR) =   1.54
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.41
  TOTAL STREAM AREA(ACRES) =       0.41
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.53

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       29.91    9.66    1.551  0.30( 0.08) 0.25      17.4      78.00
      1       30.62   10.29    1.496  0.30( 0.08) 0.25      18.5      65.00
```

1	31.37	10.86	1.450	0.30(0.08)	0.25	19.7	75.00
1	31.96	11.34	1.415	0.30(0.08)	0.25	20.7	72.00
1	32.40	11.72	1.388	0.30(0.08)	0.25	21.5	71.00
1	32.49	11.81	1.382	0.30(0.08)	0.25	21.6	58.00
1	32.56	11.87	1.378	0.30(0.08)	0.25	21.8	51.00
1	32.88	12.19	1.357	0.30(0.08)	0.25	22.4	59.00
1	32.89	12.20	1.356	0.30(0.08)	0.25	22.5	77.00
1	32.93	12.25	1.354	0.30(0.08)	0.25	22.6	55.00
1	33.24	12.60	1.332	0.30(0.08)	0.25	23.3	63.00
1	33.25	12.60	1.332	0.30(0.08)	0.25	23.3	43.00
1	33.37	12.77	1.321	0.30(0.08)	0.25	23.6	45.00
1	33.57	13.08	1.304	0.30(0.08)	0.25	24.2	68.00
1	33.68	13.26	1.293	0.30(0.08)	0.25	24.5	30.00
1	33.70	13.31	1.291	0.30(0.08)	0.25	24.6	60.00
1	33.77	13.49	1.281	0.30(0.08)	0.25	24.9	38.00
1	33.93	13.89	1.259	0.30(0.07)	0.25	25.6	30.00
1	33.96	14.00	1.253	0.30(0.07)	0.25	25.8	36.00
1	34.19	14.90	1.210	0.30(0.07)	0.24	27.2	38.00
1	34.20	14.99	1.206	0.30(0.07)	0.24	27.3	72.00
1	34.25	15.51	1.182	0.30(0.07)	0.24	28.1	14.00
1	34.26	15.59	1.179	0.30(0.07)	0.24	28.2	27.00
1	34.26	15.67	1.175	0.30(0.07)	0.24	28.3	26.00
1	34.31	16.35	1.147	0.30(0.07)	0.24	29.3	20.00
1	34.28	16.67	1.134	0.30(0.07)	0.24	29.8	23.00
1	34.26	16.83	1.128	0.30(0.07)	0.24	30.0	29.00
1	34.25	16.86	1.127	0.30(0.07)	0.24	30.0	17.00
1	34.24	16.93	1.124	0.30(0.07)	0.24	30.1	50.00
1	33.82	17.59	1.100	0.30(0.07)	0.24	30.5	34.00
1	33.55	18.01	1.085	0.30(0.07)	0.24	30.8	39.00
1	33.04	18.63	1.064	0.30(0.07)	0.24	31.1	24.00
1	29.96	22.99	0.943	0.30(0.07)	0.23	33.0	12.00
1	29.74	23.36	0.934	0.30(0.07)	0.23	33.1	64.00
1	28.14	26.23	0.874	0.30(0.07)	0.23	34.1	32.00
1	27.56	27.01	0.860	0.30(0.07)	0.23	34.1	10.00
2	0.53	9.81	1.538	0.30(0.11)	0.35	0.4	59.00

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	30.43	9.66	1.551	0.30(0.08)	0.25	17.8	78.00
2	30.60	9.81	1.538	0.30(0.08)	0.25	18.1	59.00
3	31.14	10.29	1.496	0.30(0.08)	0.25	18.9	65.00
4	31.86	10.86	1.450	0.30(0.08)	0.25	20.1	75.00
5	32.44	11.34	1.415	0.30(0.08)	0.25	21.1	72.00
6	32.88	11.72	1.388	0.30(0.08)	0.25	21.9	71.00
7	32.96	11.81	1.382	0.30(0.08)	0.25	22.1	58.00
8	33.03	11.87	1.378	0.30(0.08)	0.25	22.2	51.00
9	33.34	12.19	1.357	0.30(0.08)	0.25	22.8	59.00
10	33.35	12.20	1.356	0.30(0.08)	0.25	22.9	77.00
11	33.39	12.25	1.354	0.30(0.08)	0.25	23.0	55.00
12	33.69	12.60	1.332	0.30(0.08)	0.25	23.7	63.00

13	33.70	12.60	1.332	0.30(0.08)	0.25	23.7	43.00
14	33.82	12.77	1.321	0.30(0.08)	0.25	24.0	45.00
15	34.02	13.08	1.304	0.30(0.08)	0.25	24.6	68.00
16	34.12	13.26	1.293	0.30(0.08)	0.25	24.9	30.00
17	34.14	13.31	1.291	0.30(0.08)	0.25	25.0	60.00
18	34.21	13.49	1.281	0.30(0.08)	0.25	25.3	38.00
19	34.35	13.89	1.259	0.30(0.08)	0.25	26.0	30.00
20	34.39	14.00	1.253	0.30(0.08)	0.25	26.2	36.00
21	34.59	14.90	1.210	0.30(0.07)	0.25	27.6	38.00
22	34.61	14.99	1.206	0.30(0.07)	0.25	27.7	72.00
23	34.64	15.51	1.182	0.30(0.07)	0.24	28.5	14.00
24	34.65	15.59	1.179	0.30(0.07)	0.24	28.6	27.00
25	34.66	15.67	1.175	0.30(0.07)	0.24	28.7	26.00
26	34.69	16.35	1.147	0.30(0.07)	0.24	29.7	20.00
27	34.66	16.67	1.134	0.30(0.07)	0.24	30.2	23.00
28	34.64	16.83	1.128	0.30(0.07)	0.24	30.4	29.00
29	34.63	16.86	1.127	0.30(0.07)	0.24	30.4	17.00
30	34.61	16.93	1.124	0.30(0.07)	0.24	30.5	50.00
31	34.19	17.59	1.100	0.30(0.07)	0.24	31.0	34.00
32	33.91	18.01	1.085	0.30(0.07)	0.24	31.2	39.00
33	33.39	18.63	1.064	0.30(0.07)	0.24	31.5	24.00
34	30.27	22.99	0.943	0.30(0.07)	0.23	33.4	12.00
35	30.05	23.36	0.934	0.30(0.07)	0.23	33.5	64.00
36	28.42	26.23	0.874	0.30(0.07)	0.23	34.5	32.00
37	27.84	27.01	0.860	0.30(0.07)	0.23	34.5	10.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 34.69 Tc(MIN.) = 16.35
EFFECTIVE AREA(ACRES) = 29.74 AREA-AVERAGED Fm(INCH/HR) = 0.07
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.24
TOTAL AREA(ACRES) = 34.5
LONGEST FLOWPATH FROM NODE 10.00 TO NODE 74.00 = 2940.00 FEET.

****
FLOW PROCESS FROM NODE 80.00 TO NODE 81.00 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========
INITIAL SUBAREA FLOW-LENGTH(FEET) = 290.00
ELEVATION DATA: UPSTREAM(FEET) = 166.40 DOWNSTREAM(FEET) = 165.90

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.484
* 2 YEAR RAINFALL INTENSITY(INCH/HR) = 1.480
SUBAREA Tc AND LOSS RATE DATA(AMC I):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
COMMERCIAL	B	0.76	0.30	0.100	36	10.48

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA RUNOFF(CFS) = 0.99
TOTAL AREA(ACRES) = 0.76 PEAK FLOW RATE(CFS) = 0.99

```
****************************************************************************
  FLOW PROCESS FROM NODE     81.00 TO NODE     82.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   153.00  DOWNSTREAM(FEET) =   147.60
  FLOW LENGTH(FEET) =   320.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   3.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.61
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.99
  PIPE TRAVEL TIME(MIN.) =   1.16    Tc(MIN.) =   11.64
  LONGEST FLOWPATH FROM NODE     80.00 TO NODE     82.00 =     610.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     82.00 TO NODE     82.00 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.) =   11.64
  RAINFALL INTENSITY(INCH/HR) =   1.39
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       0.76
  TOTAL STREAM AREA(ACRES) =       0.76
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.99

****************************************************************************
  FLOW PROCESS FROM NODE     81.00 TO NODE     82.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   320.00
  ELEVATION DATA: UPSTREAM(FEET) =    165.90  DOWNSTREAM(FEET) =    165.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.122
  *   2 YEAR RAINFALL INTENSITY(INCH/HR) =  1.431
  SUBAREA Tc AND LOSS RATE DATA(AMC  I ):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        0.59      0.30      0.100    36   11.12
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.74
  TOTAL AREA(ACRES) =      0.59   PEAK FLOW RATE(CFS) =      0.74

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

```
 FLOW PROCESS FROM NODE     82.00 TO NODE     82.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   11.12
 RAINFALL INTENSITY(INCH/HR) =   1.43
 AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       0.59
 TOTAL STREAM AREA(ACRES) =       0.59
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.74

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        0.99   11.64    1.394  0.30( 0.03) 0.10       0.8      80.00
     2        0.74   11.12    1.431  0.30( 0.03) 0.10       0.6      81.00

 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        1.72   11.12    1.431  0.30( 0.03) 0.10       1.3      81.00
     2        1.72   11.64    1.394  0.30( 0.03) 0.10       1.3      80.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       1.72    Tc(MIN.) =    11.12
 EFFECTIVE AREA(ACRES) =       1.32   AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =        1.3
 LONGEST FLOWPATH FROM NODE     80.00 TO NODE     82.00 =     610.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =        1.3  TC(MIN.) =     11.12
 EFFECTIVE AREA(ACRES) =      1.32  AREA-AVERAGED Fm(INCH/HR)=  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.100
 PEAK FLOW RATE(CFS)   =       1.72

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        1.72   11.12    1.431  0.30( 0.03) 0.10       1.3      81.00
     2        1.72   11.64    1.394  0.30( 0.03) 0.10       1.3      80.00
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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            Ver. 20.0  Release Date: 06/01/2013  License ID 1654

                          Analysis prepared by:

                          FUSCOE ENGINEERING, Inc
                        16795 Von Karman Ave., #100
                             Irvine, CA 92606
                               949-474-1960
```

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 ************************** DESCRIPTION OF STUDY **************************
* FREEMAN                                                                *
* PROPOSED CONDITION                                                     *
* 10 YEAR ANALYSIS                                                       *
 ************************************************************************

  FILE NAME: FRPR10.DAT
  TIME/DATE OF STUDY: 09:20 05/29/2017
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   24.0     19.0    0.020/0.020/0.020   0.67    2.00 0.0313 0.167 0.0150
  2   18.0     13.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.50 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     10.00 TO NODE     32.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   265.00
 ELEVATION DATA: UPSTREAM(FEET) =    167.50  DOWNSTREAM(FEET) =    166.30

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.337
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.029
 SUBAREA Tc 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        0.15      0.30     0.100    56    8.34
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =      0.40
 TOTAL AREA(ACRES) =      0.15   PEAK FLOW RATE(CFS) =      0.40

****************************************************************************
 FLOW PROCESS FROM NODE     32.00 TO NODE     11.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  166.30  DOWNSTREAM ELEVATION(FEET) =  165.10
 STREET LENGTH(FEET) =   210.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 25.00

 DISTANCE FROM CROWN 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) =       0.54
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.24
   HALFSTREET FLOOD WIDTH(FEET) =    5.48
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.30
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.31
 STREET FLOW TRAVEL TIME(MIN.) =   2.70   Tc(MIN.) =   11.04
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.579
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B        0.12      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) =    0.12      SUBAREA RUNOFF(CFS) =    0.28
```

```
  EFFECTIVE AREA(ACRES) =      0.27    AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        0.3        PEAK FLOW RATE(CFS) =       0.62

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.24   HALFSTREET FLOOD WIDTH(FEET) =   5.90
  FLOW VELOCITY(FEET/SEC.) =  1.33   DEPTH*VELOCITY(FT*FT/SEC.) =   0.32
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     11.00 =     475.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     11.00 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.) =   11.04
  RAINFALL INTENSITY(INCH/HR) =   2.58
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       0.27
  TOTAL STREAM AREA(ACRES) =       0.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.62

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE     11.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   210.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.00  DOWNSTREAM(FEET) =    165.10

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.680
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.174
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        0.76      0.30      0.100    56    7.68
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      2.15
  TOTAL AREA(ACRES) =      0.76   PEAK FLOW RATE(CFS) =      2.15

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     11.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
```

```
 TIME OF CONCENTRATION(MIN.) =    7.68
 RAINFALL INTENSITY(INCH/HR) =   3.17
 AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       0.76
 TOTAL STREAM AREA(ACRES) =       0.76
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.15

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        0.62   11.04    2.579  0.30( 0.03) 0.10       0.3      10.00
     2        2.15    7.68    3.174  0.30( 0.03) 0.10       0.8      12.00

 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        2.68    7.68    3.174  0.30( 0.03) 0.10       0.9      12.00
     2        2.36   11.04    2.579  0.30( 0.03) 0.10       1.0      10.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       2.68    Tc(MIN.) =     7.68
 EFFECTIVE AREA(ACRES) =       0.95   AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =        1.0
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     11.00 =     475.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     11.00 TO NODE     13.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  165.10  DOWNSTREAM ELEVATION(FEET) =  164.20
 STREET LENGTH(FEET) =   455.00   CURB HEIGHT(INCHES) =  8.0
 STREET HALFWIDTH(FEET) = 24.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  19.00
 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) =       3.05
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.45
   HALFSTREET FLOOD WIDTH(FEET) =   14.83
```

```
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.28
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.58
  STREET FLOW TRAVEL TIME(MIN.) =   5.94   Tc(MIN.) =   13.62
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.286
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        0.36      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) =    0.36      SUBAREA RUNOFF(CFS) =    0.73
  EFFECTIVE AREA(ACRES) =      1.31    AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        1.4        PEAK FLOW RATE(CFS) =       2.68
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.44   HALFSTREET FLOOD WIDTH(FEET) =  14.09
  FLOW VELOCITY(FEET/SEC.) =  1.23   DEPTH*VELOCITY(FT*FT/SEC.) =   0.54
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     13.00 =     930.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.62
  RAINFALL INTENSITY(INCH/HR) =   2.29
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       1.31
  TOTAL STREAM AREA(ACRES) =       1.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.68

****************************************************************************
  FLOW PROCESS FROM NODE     14.00 TO NODE     15.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   125.00
  ELEVATION DATA: UPSTREAM(FEET) =    164.60  DOWNSTREAM(FEET) =    164.20

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.616
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.458
  SUBAREA Tc 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        0.15      0.30     0.100    56    6.62
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
```

```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.46
  TOTAL AREA(ACRES) =      0.15   PEAK FLOW RATE(CFS) =      0.46

****************************************************************************
  FLOW PROCESS FROM NODE     15.00 TO NODE     13.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   159.30  DOWNSTREAM(FEET) =   159.20
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   3.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.66
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.46
  PIPE TRAVEL TIME(MIN.) =   0.50    Tc(MIN.) =    7.12
  LONGEST FLOWPATH FROM NODE     14.00 TO NODE     13.00 =     175.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.12
  RAINFALL INTENSITY(INCH/HR) =   3.32
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       0.15
  TOTAL STREAM AREA(ACRES) =       0.15
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.46

  ** CONFLUENCE DATA **
   STREAM       Q      Tc    Intensity   Fp(Fm)     Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        2.68   13.62    2.286  0.30( 0.03) 0.10       1.3      12.00
      1        2.47   17.18    2.001  0.30( 0.03) 0.10       1.4      10.00
      2        0.46    7.12    3.316  0.30( 0.03) 0.10       0.2      14.00

  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        2.50    7.12    3.316  0.30( 0.03) 0.10       0.8      14.00
      2        3.00   13.62    2.286  0.30( 0.03) 0.10       1.5      12.00
      3        2.74   17.18    2.001  0.30( 0.03) 0.10       1.5      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
```

```
  PEAK FLOW RATE(CFS) =       3.00    Tc(MIN.) =    13.62
  EFFECTIVE AREA(ACRES) =       1.46   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        1.5
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     13.00 =     930.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     16.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   159.20  DOWNSTREAM(FEET) =   151.55
  FLOW LENGTH(FEET) =   235.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.68
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.00
  PIPE TRAVEL TIME(MIN.) =   0.51    Tc(MIN.) =   14.13
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     16.00 =    1165.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     17.00 TO NODE     18.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   150.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.90  DOWNSTREAM(FEET) =    166.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.741
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.948
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.36      0.30      0.350    56    8.74
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.92
  TOTAL AREA(ACRES) =      0.36   PEAK FLOW RATE(CFS) =      0.92

****************************************************************************
  FLOW PROCESS FROM NODE     18.00 TO NODE     19.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   153.00  DOWNSTREAM(FEET) =   151.60
 FLOW LENGTH(FEET) =    65.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   3.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.93
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.92
 PIPE TRAVEL TIME(MIN.) =   0.22    Tc(MIN.) =    8.96
 LONGEST FLOWPATH FROM NODE     17.00 TO NODE     19.00 =     215.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     19.00 TO NODE     19.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =    8.96
 RAINFALL INTENSITY(INCH/HR) =   2.91
 AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.35
 EFFECTIVE STREAM AREA(ACRES) =       0.36
 TOTAL STREAM AREA(ACRES) =       0.36
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.92

****************************************************************************
 FLOW PROCESS FROM NODE     20.00 TO NODE     21.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   150.00
 ELEVATION DATA: UPSTREAM(FEET) =    167.30  DOWNSTREAM(FEET) =    166.80

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.359
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.024
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 CONDOMINIUMS               A        0.50      0.40     0.350    32    8.36
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
 SUBAREA RUNOFF(CFS) =      1.30
 TOTAL AREA(ACRES) =      0.50   PEAK FLOW RATE(CFS) =      1.30

****************************************************************************
 FLOW PROCESS FROM NODE     21.00 TO NODE     19.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   153.00  DOWNSTREAM(FEET) =   151.60
```

```
 FLOW LENGTH(FEET) =    45.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   3.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.20
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.30
 PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =    8.48
 LONGEST FLOWPATH FROM NODE     20.00 TO NODE     19.00 =     195.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     19.00 TO NODE     19.00 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.) =    8.48
 RAINFALL INTENSITY(INCH/HR) =   3.00
 AREA-AVERAGED Fm(INCH/HR) =  0.14
 AREA-AVERAGED Fp(INCH/HR) =  0.40
 AREA-AVERAGED Ap =  0.35
 EFFECTIVE STREAM AREA(ACRES) =       0.50
 TOTAL STREAM AREA(ACRES) =       0.50
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.30

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        0.92    8.96    2.906  0.30( 0.11) 0.35       0.4      17.00
     2        1.30    8.48    2.999  0.40( 0.14) 0.35       0.5      20.00

 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        2.20    8.48    2.999  0.36( 0.13) 0.35       0.8      20.00
     2        2.18    8.96    2.906  0.36( 0.13) 0.35       0.9      17.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       2.20    Tc(MIN.) =     8.48
 EFFECTIVE AREA(ACRES) =       0.84   AREA-AVERAGED Fm(INCH/HR) =  0.13
 AREA-AVERAGED Fp(INCH/HR) =  0.36  AREA-AVERAGED Ap =  0.35
 TOTAL AREA(ACRES) =        0.9
 LONGEST FLOWPATH FROM NODE     17.00 TO NODE     19.00 =     215.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     19.00 TO NODE     19.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
 MAINLINE Tc(MIN.) =    8.48
```

```
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.999
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  CONDOMINIUMS               B        0.42      0.30     0.350    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA AREA(ACRES) =    0.42      SUBAREA RUNOFF(CFS) =    1.09
  EFFECTIVE AREA(ACRES) =      1.26   AREA-AVERAGED Fm(INCH/HR) =  0.12
  AREA-AVERAGED Fp(INCH/HR) =  0.34  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        1.3       PEAK FLOW RATE(CFS) =       3.27

****************************************************************************
  FLOW PROCESS FROM NODE     19.00 TO NODE     16.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   151.60  DOWNSTREAM(FEET) =   151.55
  FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.62
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.27
  PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =    8.67
  LONGEST FLOWPATH FROM NODE     17.00 TO NODE     16.00 =     245.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 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        3.27    8.67    2.961  0.34( 0.12) 0.35       1.3      20.00
      2        3.21    9.15    2.871  0.34( 0.12) 0.35       1.3      17.00
  LONGEST FLOWPATH FROM NODE     17.00 TO NODE     16.00 =     245.00 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        2.50    7.65    3.181  0.30( 0.03) 0.10       0.8      14.00
      2        3.00   14.13    2.238  0.30( 0.03) 0.10       1.5      12.00
      3        2.74   17.71    1.967  0.30( 0.03) 0.10       1.5      10.00
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     16.00 =    1165.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        5.61    7.65    3.181  0.33( 0.08) 0.24       1.9      14.00
      2        5.85    8.67    2.961  0.33( 0.08) 0.24       2.2      20.00
      3        5.83    9.15    2.871  0.33( 0.08) 0.24       2.3      17.00
```

```
      4        5.47   14.13    2.238  0.33( 0.07) 0.22       2.7      12.00
      5        4.90   17.71    1.967  0.33( 0.07) 0.21       2.8      10.00
    TOTAL AREA(ACRES) =          2.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =        5.85  Tc(MIN.) =    8.671
  EFFECTIVE AREA(ACRES) =      2.19  AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.33  AREA-AVERAGED Ap =  0.24
  TOTAL AREA(ACRES) =        2.8
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     16.00 =    1165.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     22.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   151.55  DOWNSTREAM(FEET) =   151.30
  FLOW LENGTH(FEET) =   115.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.34
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.85
  PIPE TRAVEL TIME(MIN.) =   0.57    Tc(MIN.) =    9.25
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     22.00 =    1280.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     22.00 TO NODE     22.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    9.25
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.854
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  CONDOMINIUMS               A        0.31      0.40     0.350    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA AREA(ACRES) =    0.31      SUBAREA RUNOFF(CFS) =    0.76
  EFFECTIVE AREA(ACRES) =      2.50   AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.34  AREA-AVERAGED Ap =  0.26
  TOTAL AREA(ACRES) =        3.1       PEAK FLOW RATE(CFS) =       6.23

****************************************************************************
  FLOW PROCESS FROM NODE     22.00 TO NODE     22.00 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.) =    9.25
  RAINFALL INTENSITY(INCH/HR) =   2.85
  AREA-AVERAGED Fm(INCH/HR) =  0.09
```

```
 AREA-AVERAGED Fp(INCH/HR) =  0.34
 AREA-AVERAGED Ap =  0.26
 EFFECTIVE STREAM AREA(ACRES) =       2.50
 TOTAL STREAM AREA(ACRES) =       3.13
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       6.23

****************************************************************************
 FLOW PROCESS FROM NODE     23.00 TO NODE     22.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   225.00
 ELEVATION DATA: UPSTREAM(FEET) =    166.30  DOWNSTREAM(FEET) =    165.50

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.705
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.776
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 CONDOMINIUMS               B        0.71      0.30     0.350    56    9.70
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
 SUBAREA RUNOFF(CFS) =      1.71
 TOTAL AREA(ACRES) =      0.71   PEAK FLOW RATE(CFS) =      1.71

****************************************************************************
 FLOW PROCESS FROM NODE     22.00 TO NODE     22.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.70
 RAINFALL INTENSITY(INCH/HR) =   2.78
 AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.35
 EFFECTIVE STREAM AREA(ACRES) =       0.71
 TOTAL STREAM AREA(ACRES) =       0.71
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.71

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        6.01    8.23    3.051  0.35( 0.09) 0.26       2.3      14.00
     1        6.23    9.25    2.854  0.34( 0.09) 0.26       2.5      20.00
     1        6.20    9.73    2.773  0.34( 0.09) 0.25       2.6      17.00
     1        5.78   14.72    2.187  0.34( 0.08) 0.23       3.0      12.00
     1        5.22   18.30    1.930  0.34( 0.08) 0.23       3.1      10.00
     2        1.71    9.70    2.776  0.30( 0.11) 0.35       0.7      23.00
```

```
  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        7.61    8.23    3.051  0.33( 0.09) 0.28       2.9      14.00
      2        7.90    9.25    2.854  0.33( 0.09) 0.28       3.2      20.00
      3        7.91    9.70    2.776  0.33( 0.09) 0.28       3.3      23.00
      4        7.91    9.73    2.773  0.33( 0.09) 0.28       3.3      17.00
      5        7.11   14.72    2.187  0.33( 0.08) 0.25       3.8      12.00
      6        6.39   18.30    1.930  0.33( 0.08) 0.25       3.8      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       7.91    Tc(MIN.) =     9.70
  EFFECTIVE AREA(ACRES) =       3.27   AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.33  AREA-AVERAGED Ap =  0.28
  TOTAL AREA(ACRES) =        3.8
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     22.00 =    1280.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     22.00 TO NODE     22.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     24.00 TO NODE     25.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   270.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.354
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.675
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.51      0.30     0.350    56   10.35
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.18
  TOTAL AREA(ACRES) =      0.51   PEAK FLOW RATE(CFS) =      1.18

****************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE     25.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
```

```
  TIME OF CONCENTRATION(MIN.) =   10.35
  RAINFALL INTENSITY(INCH/HR) =   2.67
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.51
  TOTAL STREAM AREA(ACRES) =       0.51
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.18

****************************************************************************
  FLOW PROCESS FROM NODE     26.00 TO NODE     25.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   155.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.422
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.237
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.30      0.30     0.350    56    7.42
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.85
  TOTAL AREA(ACRES) =      0.30   PEAK FLOW RATE(CFS) =      0.85

****************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE     25.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.42
  RAINFALL INTENSITY(INCH/HR) =   3.24
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.30
  TOTAL STREAM AREA(ACRES) =       0.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.85

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        1.18   10.35    2.675  0.30( 0.11) 0.35       0.5      24.00
      2        0.85    7.42    3.237  0.30( 0.10) 0.35       0.3      26.00

  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        1.88    7.42    3.237  0.30( 0.10) 0.35       0.7      26.00
      2        1.87   10.35    2.675  0.30( 0.11) 0.35       0.8      24.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       1.88    Tc(MIN.) =     7.42
  EFFECTIVE AREA(ACRES) =       0.67   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        0.8
  LONGEST FLOWPATH FROM NODE     24.00 TO NODE     25.00 =     270.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE     28.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   161.00  DOWNSTREAM(FEET) =   158.00
  FLOW LENGTH(FEET) =   175.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   5.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.51
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.88
  PIPE TRAVEL TIME(MIN.) =   0.53    Tc(MIN.) =    7.95
  LONGEST FLOWPATH FROM NODE     24.00 TO NODE     28.00 =     445.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     28.00 TO NODE     28.00 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.) =    7.95
  RAINFALL INTENSITY(INCH/HR) =   3.11
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.67
  TOTAL STREAM AREA(ACRES) =       0.81
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.88

****************************************************************************
  FLOW PROCESS FROM NODE     27.00 TO NODE     28.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   180.00
```

```
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.965
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.109
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.18      0.30     0.350    56    7.97
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.49
  TOTAL AREA(ACRES) =      0.18   PEAK FLOW RATE(CFS) =      0.49

****************************************************************************
  FLOW PROCESS FROM NODE     28.00 TO NODE     28.00 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.) =    7.97
  RAINFALL INTENSITY(INCH/HR) =   3.11
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.18
  TOTAL STREAM AREA(ACRES) =       0.18
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.49

****************************************************************************
  FLOW PROCESS FROM NODE     29.00 TO NODE     28.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   230.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.227
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.858
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.48      0.30     0.350    56    9.23
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.19
  TOTAL AREA(ACRES) =      0.48   PEAK FLOW RATE(CFS) =      1.19

****************************************************************************
  FLOW PROCESS FROM NODE     28.00 TO NODE     28.00 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.) =    9.23
  RAINFALL INTENSITY(INCH/HR) =   2.86
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.48
  TOTAL STREAM AREA(ACRES) =       0.48
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.19

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        1.88    7.95    3.112  0.30( 0.10) 0.35       0.7      26.00
      1        1.87   10.88    2.600  0.30( 0.11) 0.35       0.8      24.00
      2        0.49    7.97    3.109  0.30( 0.11) 0.35       0.2      27.00
      3        1.19    9.23    2.858  0.30( 0.11) 0.35       0.5      29.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        3.48    7.95    3.112  0.30( 0.10) 0.35       1.3      26.00
      2        3.48    7.97    3.109  0.30( 0.10) 0.35       1.3      27.00
      3        3.52    9.23    2.858  0.30( 0.11) 0.35       1.4      29.00
      4        3.36   10.88    2.600  0.30( 0.11) 0.35       1.5      24.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       3.52    Tc(MIN.) =     9.23
  EFFECTIVE AREA(ACRES) =       1.39   AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        1.5
  LONGEST FLOWPATH FROM NODE     24.00 TO NODE     28.00 =     445.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     28.00 TO NODE     22.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   158.00  DOWNSTREAM(FEET) =   151.30
  FLOW LENGTH(FEET) =   250.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.62
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.52
  PIPE TRAVEL TIME(MIN.) =   0.55    Tc(MIN.) =    9.77
  LONGEST FLOWPATH FROM NODE     24.00 TO NODE     22.00 =     695.00 FEET.
```

```
****************************************************************************
 FLOW PROCESS FROM NODE     22.00 TO NODE     22.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        3.48    8.50    2.995  0.30( 0.10) 0.35       1.3      26.00
     2        3.48    8.51    2.993  0.30( 0.10) 0.35       1.3      27.00
     3        3.52    9.77    2.765  0.30( 0.11) 0.35       1.4      29.00
     4        3.36   11.44    2.527  0.30( 0.11) 0.35       1.5      24.00
 LONGEST FLOWPATH FROM NODE     24.00 TO NODE     22.00 =     695.00 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        7.61    8.23    3.051  0.33( 0.09) 0.28       2.9      14.00
     2        7.90    9.25    2.854  0.33( 0.09) 0.28       3.2      20.00
     3        7.91    9.70    2.776  0.33( 0.09) 0.28       3.3      23.00
     4        7.91    9.73    2.773  0.33( 0.09) 0.28       3.3      17.00
     5        7.11   14.72    2.187  0.33( 0.08) 0.25       3.8      12.00
     6        6.39   18.30    1.930  0.33( 0.08) 0.25       3.8      10.00
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     22.00 =    1280.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       11.05    8.23    3.051  0.32( 0.10) 0.30       4.1      14.00
     2       11.17    8.50    2.995  0.32( 0.10) 0.30       4.2      26.00
     3       11.17    8.51    2.993  0.32( 0.10) 0.30       4.2      27.00
     4       11.40    9.25    2.854  0.32( 0.10) 0.30       4.5      20.00
     5       11.43    9.70    2.776  0.32( 0.10) 0.30       4.7      23.00
     6       11.42    9.73    2.773  0.32( 0.10) 0.30       4.7      17.00
     7       11.42    9.77    2.765  0.32( 0.10) 0.30       4.7      29.00
     8       10.99   11.44    2.527  0.32( 0.09) 0.29       4.9      24.00
     9       10.00   14.72    2.187  0.32( 0.09) 0.28       5.2      12.00
    10        8.91   18.30    1.930  0.32( 0.09) 0.28       5.3      10.00
   TOTAL AREA(ACRES) =         5.3

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       11.43  Tc(MIN.) =    9.705
 EFFECTIVE AREA(ACRES) =      4.66  AREA-AVERAGED Fm(INCH/HR) =  0.10
 AREA-AVERAGED Fp(INCH/HR) =  0.32  AREA-AVERAGED Ap =  0.30
 TOTAL AREA(ACRES) =        5.3
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     22.00 =    1280.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     22.00 TO NODE     33.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   151.30  DOWNSTREAM(FEET) =   150.50
  FLOW LENGTH(FEET) =   425.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  19.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.71
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.43
  PIPE TRAVEL TIME(MIN.) =   1.91    Tc(MIN.) =   11.61
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     33.00 =    1705.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE     31.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   150.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.277
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.274
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.29      0.30      0.350    56    7.28
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.83
  TOTAL AREA(ACRES) =      0.29   PEAK FLOW RATE(CFS) =      0.83

****************************************************************************
  FLOW PROCESS FROM NODE     31.00 TO NODE     31.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    7.28
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.274
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  CONDOMINIUMS               B        0.65      0.30      0.350    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA AREA(ACRES) =    0.65      SUBAREA RUNOFF(CFS) =    1.85
  EFFECTIVE AREA(ACRES) =      0.94   AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        0.9       PEAK FLOW RATE(CFS) =       2.68
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     31.00 TO NODE     33.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   157.00  DOWNSTREAM(FEET) =   150.50
  FLOW LENGTH(FEET) =   380.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.02
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.68
  PIPE TRAVEL TIME(MIN.) =   1.05    Tc(MIN.) =    8.33
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     33.00 =     530.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 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        2.68    8.33    3.030  0.30( 0.11) 0.35       0.9      30.00
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     33.00 =     530.00 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       11.05   10.15    2.706  0.32( 0.10) 0.30       4.1      14.00
      2       11.17   10.41    2.666  0.32( 0.10) 0.30       4.2      26.00
      3       11.17   10.43    2.664  0.32( 0.10) 0.30       4.2      27.00
      4       11.40   11.15    2.563  0.32( 0.10) 0.30       4.5      20.00
      5       11.43   11.61    2.505  0.32( 0.10) 0.30       4.7      23.00
      6       11.42   11.64    2.502  0.32( 0.10) 0.30       4.7      17.00
      7       11.42   11.68    2.496  0.32( 0.10) 0.30       4.7      29.00
      8       10.99   13.36    2.312  0.32( 0.09) 0.29       4.9      24.00
      9       10.00   16.67    2.036  0.32( 0.09) 0.28       5.2      12.00
     10        8.91   20.35    1.816  0.32( 0.09) 0.28       5.3      10.00
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     33.00 =    1705.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       12.87    8.33    3.030  0.32( 0.10) 0.31       4.3      30.00
      2       13.43   10.15    2.706  0.32( 0.10) 0.31       5.0      14.00
      3       13.52   10.41    2.666  0.32( 0.10) 0.31       5.1      26.00
      4       13.52   10.43    2.664  0.32( 0.10) 0.31       5.1      27.00
      5       13.66   11.15    2.563  0.32( 0.10) 0.31       5.5      20.00
      6       13.63   11.61    2.505  0.32( 0.10) 0.31       5.6      23.00
      7       13.62   11.64    2.502  0.32( 0.10) 0.31       5.6      17.00
      8       13.61   11.68    2.496  0.32( 0.10) 0.31       5.6      29.00
```

```
      9       13.02   13.36    2.312  0.32( 0.10) 0.30       5.9      24.00
     10       11.77   16.67    2.036  0.32( 0.09) 0.29       6.2      12.00
     11       10.48   20.35    1.816  0.32( 0.09) 0.29       6.2      10.00
    TOTAL AREA(ACRES) =         6.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       13.66  Tc(MIN.) =   11.154
  EFFECTIVE AREA(ACRES) =      5.45  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.32  AREA-AVERAGED Ap =  0.31
  TOTAL AREA(ACRES) =        6.2
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     33.00 =    1705.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     22.00 TO NODE     22.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  5
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.15
  RAINFALL INTENSITY(INCH/HR) =   2.56
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.32
  AREA-AVERAGED Ap =  0.31
  EFFECTIVE STREAM AREA(ACRES) =       5.45
  TOTAL STREAM AREA(ACRES) =       6.25
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      13.66

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE     33.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   185.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.60  DOWNSTREAM(FEET) =    166.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.141
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.873
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS             B        0.67      0.30      0.350    56    9.14
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.67
  TOTAL AREA(ACRES) =      0.67   PEAK FLOW RATE(CFS) =      1.67

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  5
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.14
  RAINFALL INTENSITY(INCH/HR) =   2.87
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.67
  TOTAL STREAM AREA(ACRES) =       0.67
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.67

****************************************************************************
  FLOW PROCESS FROM NODE     34.00 TO NODE     35.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   180.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.20  DOWNSTREAM(FEET) =    166.10

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.867
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.362
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS             B        0.50      0.30      0.350    56   12.87
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.02
  TOTAL AREA(ACRES) =      0.50   PEAK FLOW RATE(CFS) =      1.02

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  5
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.87
  RAINFALL INTENSITY(INCH/HR) =   2.36
  AREA-AVERAGED Fm(INCH/HR) =  0.11
```

```
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.35
 EFFECTIVE STREAM AREA(ACRES) =       0.50
 TOTAL STREAM AREA(ACRES) =       0.50
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.02

****************************************************************************
 FLOW PROCESS FROM NODE     36.00 TO NODE     37.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   150.00
 ELEVATION DATA: UPSTREAM(FEET) =    166.70  DOWNSTREAM(FEET) =    166.40

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.258
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.852
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 CONDOMINIUMS               B        0.29      0.30     0.350    56    9.26
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
 SUBAREA RUNOFF(CFS) =      0.72
 TOTAL AREA(ACRES) =      0.29   PEAK FLOW RATE(CFS) =      0.72

****************************************************************************
 FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  5
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  4 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.26
 RAINFALL INTENSITY(INCH/HR) =   2.85
 AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.35
 EFFECTIVE STREAM AREA(ACRES) =       0.29
 TOTAL STREAM AREA(ACRES) =       0.29
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.72

****************************************************************************
 FLOW PROCESS FROM NODE     38.00 TO NODE     33.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   150.00
 ELEVATION DATA: UPSTREAM(FEET) =    166.40  DOWNSTREAM(FEET) =    166.00

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.741
```

```
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.948
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
      LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 CONDOMINIUMS              B        0.18      0.30      0.350    56    8.74
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
 SUBAREA RUNOFF(CFS) =      0.46
 TOTAL AREA(ACRES) =      0.18   PEAK FLOW RATE(CFS) =      0.46

****************************************************************************
 FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  5
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  5 ARE:
 TIME OF CONCENTRATION(MIN.) =    8.74
 RAINFALL INTENSITY(INCH/HR) =   2.95
 AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.35
 EFFECTIVE STREAM AREA(ACRES) =       0.18
 TOTAL STREAM AREA(ACRES) =       0.18
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.46

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       12.87    8.33    3.030  0.32( 0.10) 0.31       4.3      30.00
     1       13.43   10.15    2.706  0.32( 0.10) 0.31       5.0      14.00
     1       13.52   10.41    2.666  0.32( 0.10) 0.31       5.1      26.00
     1       13.52   10.43    2.664  0.32( 0.10) 0.31       5.1      27.00
     1       13.66   11.15    2.563  0.32( 0.10) 0.31       5.5      20.00
     1       13.63   11.61    2.505  0.32( 0.10) 0.31       5.6      23.00
     1       13.62   11.64    2.502  0.32( 0.10) 0.31       5.6      17.00
     1       13.61   11.68    2.496  0.32( 0.10) 0.31       5.6      29.00
     1       13.02   13.36    2.312  0.32( 0.10) 0.30       5.9      24.00
     1       11.77   16.67    2.036  0.32( 0.09) 0.29       6.2      12.00
     1       10.48   20.35    1.816  0.32( 0.09) 0.29       6.2      10.00
     2        1.67    9.14    2.873  0.30( 0.11) 0.35       0.7      30.00
     3        1.02   12.87    2.362  0.30( 0.11) 0.35       0.5      34.00
     4        0.72    9.26    2.852  0.30( 0.11) 0.35       0.3      36.00
     5        0.46    8.74    2.948  0.30( 0.11) 0.35       0.2      38.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  5 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       16.47    8.33    3.030  0.31( 0.10) 0.32       5.7      30.00
     2       16.67    8.74    2.948  0.31( 0.10) 0.32       5.9      38.00
```

```
      3       16.84    9.14    2.873  0.31( 0.10) 0.32       6.1      30.00
      4       16.87    9.26    2.852  0.31( 0.10) 0.32       6.2      36.00
      5       17.02   10.15    2.706  0.31( 0.10) 0.32       6.6      14.00
      6       17.08   10.41    2.666  0.31( 0.10) 0.32       6.7      26.00
      7       17.08   10.43    2.664  0.31( 0.10) 0.32       6.7      27.00
      8       17.14   11.15    2.563  0.31( 0.10) 0.32       7.0      20.00
      9       17.06   11.61    2.505  0.31( 0.10) 0.32       7.2      23.00
     10       17.05   11.64    2.502  0.31( 0.10) 0.32       7.2      17.00
     11       17.04   11.68    2.496  0.31( 0.10) 0.32       7.2      29.00
     12       16.52   12.87    2.362  0.31( 0.10) 0.31       7.4      34.00
     13       16.27   13.36    2.312  0.31( 0.10) 0.31       7.5      24.00
     14       14.62   16.67    2.036  0.31( 0.09) 0.30       7.8      12.00
     15       13.01   20.35    1.816  0.31( 0.09) 0.30       7.9      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      17.14    Tc(MIN.) =    11.15
  EFFECTIVE AREA(ACRES) =       7.03   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.31  AREA-AVERAGED Ap =  0.32
  TOTAL AREA(ACRES) =        7.9
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     33.00 =    1705.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     38.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   150.50  DOWNSTREAM(FEET) =   150.20
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  23.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.15
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      17.14
  PIPE TRAVEL TIME(MIN.) =   0.60    Tc(MIN.) =   11.76
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     38.00 =    1855.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     38.00 TO NODE     38.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     39.00 TO NODE     40.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  ELEVATION DATA: UPSTREAM(FEET) =    168.00  DOWNSTREAM(FEET) =    166.90

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.822
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.608
```

```
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.80      0.30     0.350    56   10.82
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.80
  TOTAL AREA(ACRES) =      0.80   PEAK FLOW RATE(CFS) =      1.80

****************************************************************************
  FLOW PROCESS FROM NODE     40.00 TO NODE     41.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   154.00  DOWNSTREAM(FEET) =   151.10
  FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   3.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.19
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.80
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =   10.89
  LONGEST FLOWPATH FROM NODE     39.00 TO NODE     41.00 =     340.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     41.00 TO NODE     41.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   10.89
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.598
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  CONDOMINIUMS               B        0.45      0.30     0.350    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA AREA(ACRES) =    0.45      SUBAREA RUNOFF(CFS) =    1.01
  EFFECTIVE AREA(ACRES) =      1.25   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        1.2       PEAK FLOW RATE(CFS) =       2.80

****************************************************************************
  FLOW PROCESS FROM NODE     41.00 TO NODE     42.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   151.10  DOWNSTREAM(FEET) =   150.60
  FLOW LENGTH(FEET) =   270.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.65
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
```

```
  PIPE-FLOW(CFS) =       2.80
  PIPE TRAVEL TIME(MIN.) =   1.70    Tc(MIN.) =   12.60
  LONGEST FLOWPATH FROM NODE     39.00 TO NODE     42.00 =     610.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     42.00 TO NODE     42.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE 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
  CONDOMINIUMS               B        1.15      0.30     0.350    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA AREA(ACRES) =    1.15      SUBAREA RUNOFF(CFS) =    2.37
  EFFECTIVE AREA(ACRES) =      2.40   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        2.4       PEAK FLOW RATE(CFS) =       4.94

****************************************************************************
  FLOW PROCESS FROM NODE     42.00 TO NODE     42.00 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.) =   12.60
  RAINFALL INTENSITY(INCH/HR) =   2.39
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       2.40
  TOTAL STREAM AREA(ACRES) =       2.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       4.94

****************************************************************************
  FLOW PROCESS FROM NODE     43.00 TO NODE     44.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   180.00
  ELEVATION DATA: UPSTREAM(FEET) =    168.00  DOWNSTREAM(FEET) =    166.20

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.218
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.289
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.44      0.30     0.350    56    7.22
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.26
  TOTAL AREA(ACRES) =      0.44   PEAK FLOW RATE(CFS) =      1.26

****************************************************************************
  FLOW PROCESS FROM NODE     44.00 TO NODE     42.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   153.00  DOWNSTREAM(FEET) =   150.60
  FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   3.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.20
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.26
  PIPE TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =    7.42
  LONGEST FLOWPATH FROM NODE     43.00 TO NODE     42.00 =     255.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     42.00 TO NODE     42.00 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.) =    7.42
  RAINFALL INTENSITY(INCH/HR) =   3.24
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.44
  TOTAL STREAM AREA(ACRES) =       0.44
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.26

****************************************************************************
  FLOW PROCESS FROM NODE     45.00 TO NODE     46.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   180.00
  ELEVATION DATA: UPSTREAM(FEET) =    168.00  DOWNSTREAM(FEET) =    166.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.390
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.245
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.45      0.30     0.350    56    7.39
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
```

```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.27
  TOTAL AREA(ACRES) =      0.45   PEAK FLOW RATE(CFS) =      1.27

****************************************************************************
  FLOW PROCESS FROM NODE     46.00 TO NODE     42.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   153.00  DOWNSTREAM(FEET) =   150.60
  FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   3.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.22
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.27
  PIPE TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =    7.59
  LONGEST FLOWPATH FROM NODE     45.00 TO NODE     42.00 =     255.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     42.00 TO NODE     42.00 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.) =    7.59
  RAINFALL INTENSITY(INCH/HR) =   3.20
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.45
  TOTAL STREAM AREA(ACRES) =       0.45
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.27

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        4.94   12.60    2.391  0.30( 0.10) 0.35       2.4      39.00
      2        1.26    7.42    3.238  0.30( 0.11) 0.35       0.4      43.00
      3        1.27    7.59    3.196  0.30( 0.10) 0.35       0.4      45.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        6.51    7.42    3.238  0.30( 0.10) 0.35       2.3      43.00
      2        6.54    7.59    3.196  0.30( 0.10) 0.35       2.3      45.00
      3        6.80   12.60    2.391  0.30( 0.10) 0.35       3.3      39.00
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       6.80    Tc(MIN.) =    12.60
  EFFECTIVE AREA(ACRES) =       3.29   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        3.3
  LONGEST FLOWPATH FROM NODE     39.00 TO NODE     42.00 =     610.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     42.00 TO NODE     38.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   150.60  DOWNSTREAM(FEET) =   150.20
  FLOW LENGTH(FEET) =   190.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  16.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.35
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.80
  PIPE TRAVEL TIME(MIN.) =   0.94    Tc(MIN.) =   13.54
  LONGEST FLOWPATH FROM NODE     39.00 TO NODE     38.00 =     800.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     38.00 TO NODE     38.00 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        6.51    8.37    3.022  0.30( 0.10) 0.35       2.3      43.00
      2        6.54    8.54    2.988  0.30( 0.10) 0.35       2.3      45.00
      3        6.80   13.54    2.294  0.30( 0.10) 0.35       3.3      39.00
  LONGEST FLOWPATH FROM NODE     39.00 TO NODE     38.00 =     800.00 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       16.47    8.93    2.911  0.31( 0.10) 0.32       5.7      30.00
      2       16.67    9.34    2.837  0.31( 0.10) 0.32       5.9      38.00
      3       16.84    9.74    2.770  0.31( 0.10) 0.32       6.1      30.00
      4       16.87    9.86    2.751  0.31( 0.10) 0.32       6.2      36.00
      5       17.02   10.75    2.617  0.31( 0.10) 0.32       6.6      14.00
      6       17.08   11.02    2.581  0.31( 0.10) 0.32       6.7      26.00
      7       17.08   11.03    2.580  0.31( 0.10) 0.32       6.7      27.00
      8       17.14   11.76    2.487  0.31( 0.10) 0.32       7.0      20.00
      9       17.06   12.22    2.433  0.31( 0.10) 0.32       7.2      23.00
     10       17.05   12.24    2.431  0.31( 0.10) 0.32       7.2      17.00
     11       17.04   12.29    2.425  0.31( 0.10) 0.32       7.2      29.00
     12       16.52   13.47    2.301  0.31( 0.10) 0.31       7.4      34.00
     13       16.27   13.96    2.254  0.31( 0.10) 0.31       7.5      24.00
     14       14.62   17.28    1.994  0.31( 0.09) 0.30       7.8      12.00
     15       13.01   20.99    1.784  0.31( 0.09) 0.30       7.9      10.00
```

```
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     38.00 =    1855.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       22.55    8.37    3.022  0.31( 0.10) 0.33       7.6      43.00
     2       22.71    8.54    2.988  0.31( 0.10) 0.33       7.7      45.00
     3       23.03    8.93    2.911  0.31( 0.10) 0.33       8.1      30.00
     4       23.25    9.34    2.837  0.31( 0.10) 0.33       8.4      38.00
     5       23.44    9.74    2.770  0.31( 0.10) 0.33       8.7      30.00
     6       23.47    9.86    2.751  0.31( 0.10) 0.33       8.7      36.00
     7       23.68   10.75    2.617  0.31( 0.10) 0.33       9.3      14.00
     8       23.74   11.02    2.581  0.31( 0.10) 0.33       9.5      26.00
     9       23.75   11.03    2.580  0.31( 0.10) 0.33       9.5      27.00
    10       23.84   11.76    2.487  0.31( 0.10) 0.33      10.0      20.00
    11       23.79   12.22    2.433  0.31( 0.10) 0.33      10.2      23.00
    12       23.79   12.24    2.431  0.31( 0.10) 0.33      10.2      17.00
    13       23.77   12.29    2.425  0.31( 0.10) 0.33      10.3      29.00
    14       23.32   13.47    2.301  0.31( 0.10) 0.32      10.7      34.00
    15       23.29   13.54    2.294  0.31( 0.10) 0.32      10.7      39.00
    16       22.95   13.96    2.254  0.31( 0.10) 0.32      10.8      24.00
    17       20.49   17.28    1.994  0.31( 0.10) 0.32      11.1      12.00
    18       18.22   20.99    1.784  0.31( 0.10) 0.32      11.2      10.00
  TOTAL AREA(ACRES) =        11.2

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       23.84  Tc(MIN.) =   11.757
 EFFECTIVE AREA(ACRES) =      9.98  AREA-AVERAGED Fm(INCH/HR) =  0.10
 AREA-AVERAGED Fp(INCH/HR) =  0.31  AREA-AVERAGED Ap =  0.33
 TOTAL AREA(ACRES) =       11.2
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     38.00 =    1855.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     38.00 TO NODE     38.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE     38.00 TO NODE     47.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   150.20  DOWNSTREAM(FEET) =   149.90
 FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  36.0 INCH PIPE IS  24.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.59
 ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      23.84
 PIPE TRAVEL TIME(MIN.) =   0.54    Tc(MIN.) =   12.30
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     47.00 =    2005.00 FEET.

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

```
 FLOW PROCESS FROM NODE     47.00 TO NODE     47.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE     32.00 TO NODE     48.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
 ELEVATION DATA: UPSTREAM(FEET) =    166.30  DOWNSTREAM(FEET) =    166.00

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.850
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.476
 SUBAREA Tc 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        2.62      0.30     0.100    56   11.85
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =      5.77
 TOTAL AREA(ACRES) =      2.62   PEAK FLOW RATE(CFS) =      5.77

****************************************************************************
 FLOW PROCESS FROM NODE     48.00 TO NODE     49.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  166.00  DOWNSTREAM ELEVATION(FEET) =  165.60
 STREET LENGTH(FEET) =   485.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 25.00

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

 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) =       9.78
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.56
   HALFSTREET FLOOD WIDTH(FEET) =   24.36
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.01
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.56
 STREET FLOW TRAVEL TIME(MIN.) =   7.99   Tc(MIN.) =   19.84
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.843
 SUBAREA LOSS RATE DATA(AMC  II):
```

```
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B        4.89      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) =    4.89      SUBAREA RUNOFF(CFS) =    7.98
  EFFECTIVE AREA(ACRES) =      7.51    AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        7.5        PEAK FLOW RATE(CFS) =      12.25

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.60   HALFSTREET FLOOD WIDTH(FEET) =  28.27
  FLOW VELOCITY(FEET/SEC.) =  1.05   DEPTH*VELOCITY(FT*FT/SEC.) =   0.62
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  485.0 FT WITH ELEVATION-DROP =   0.4 FT, IS    9.4 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE     49.00
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     49.00 =     785.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     49.00 TO NODE     50.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    165.60  DOWNSTREAM(FEET) =    165.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =   180.00   CHANNEL SLOPE =  0.0011
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   0.020
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      12.25
  FLOW VELOCITY(FEET/SEC.) =   2.57   FLOW DEPTH(FEET) =   0.95
  TRAVEL TIME(MIN.) =   1.17   Tc(MIN.) =   21.00
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     50.00 =     965.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     50.00 TO NODE     50.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   21.00
  RAINFALL INTENSITY(INCH/HR) =   1.78
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       7.51
  TOTAL STREAM AREA(ACRES) =       7.51
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      12.25

****************************************************************************
  FLOW PROCESS FROM NODE     50.00 TO NODE     50.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
```

```
==============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   665.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.20  DOWNSTREAM(FEET) =    165.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.351
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.312
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        6.31      0.30     0.100    56   13.35
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     12.96
  TOTAL AREA(ACRES) =      6.31   PEAK FLOW RATE(CFS) =     12.96

******************************************************************************
  FLOW PROCESS FROM NODE     50.00 TO NODE     50.00 IS CODE =   1
------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.35
  RAINFALL INTENSITY(INCH/HR) =   2.31
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       6.31
  TOTAL STREAM AREA(ACRES) =       6.31
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      12.96

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       12.25   21.00    1.784  0.30( 0.03) 0.10       7.5      32.00
      2       12.96   13.35    2.312  0.30( 0.03) 0.10       6.3      50.00

  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       23.10   13.35    2.312  0.30( 0.03) 0.10      11.1      50.00
      2       22.21   21.00    1.784  0.30( 0.03) 0.10      13.8      32.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      23.10    Tc(MIN.) =    13.35
  EFFECTIVE AREA(ACRES) =      11.08   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =      13.8
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     50.00 =     965.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     50.00 TO NODE     47.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   162.40  DOWNSTREAM(FEET) =   149.90
  FLOW LENGTH(FEET) =   185.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.96
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      23.10
  PIPE TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =   13.53
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     47.00 =    1150.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     47.00 TO NODE     47.00 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       23.10   13.53    2.295  0.30( 0.03) 0.10      11.1      50.00
      2       22.21   21.19    1.775  0.30( 0.03) 0.10      13.8      32.00
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     47.00 =    1150.00 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       22.55    8.93    2.911  0.31( 0.10) 0.33       7.6      43.00
      2       22.71    9.10    2.880  0.31( 0.10) 0.33       7.7      45.00
      3       23.03    9.50    2.811  0.31( 0.10) 0.33       8.1      30.00
      4       23.25    9.89    2.746  0.31( 0.10) 0.33       8.4      38.00
      5       23.44   10.29    2.684  0.31( 0.10) 0.33       8.7      30.00
      6       23.47   10.41    2.667  0.31( 0.10) 0.33       8.7      36.00
      7       23.68   11.30    2.544  0.31( 0.10) 0.33       9.3      14.00
      8       23.74   11.56    2.511  0.31( 0.10) 0.33       9.5      26.00
      9       23.75   11.58    2.509  0.31( 0.10) 0.33       9.5      27.00
     10       23.84   12.30    2.423  0.31( 0.10) 0.33      10.0      20.00
     11       23.79   12.76    2.373  0.31( 0.10) 0.33      10.2      23.00
     12       23.79   12.78    2.371  0.31( 0.10) 0.33      10.2      17.00
     13       23.77   12.83    2.366  0.31( 0.10) 0.33      10.3      29.00
     14       23.32   14.02    2.249  0.31( 0.10) 0.32      10.7      34.00
     15       23.29   14.09    2.242  0.31( 0.10) 0.32      10.7      39.00
     16       22.95   14.53    2.203  0.31( 0.10) 0.32      10.8      24.00
     17       20.49   17.85    1.958  0.31( 0.10) 0.32      11.1      12.00
     18       18.22   21.58    1.756  0.31( 0.10) 0.32      11.2      10.00
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     47.00 =    2005.00 FEET.

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

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	41.94	8.93	2.911	0.31(0.07)	0.22	14.9	43.00
2	42.26	9.10	2.880	0.31(0.07)	0.22	15.2	45.00
3	42.94	9.50	2.811	0.31(0.07)	0.22	15.8	30.00
4	43.50	9.89	2.746	0.31(0.07)	0.22	16.5	38.00
5	44.03	10.29	2.684	0.31(0.07)	0.22	17.1	30.00
6	44.16	10.41	2.667	0.31(0.07)	0.22	17.3	36.00
7	45.09	11.30	2.544	0.31(0.07)	0.21	18.6	14.00
8	45.37	11.56	2.511	0.31(0.07)	0.21	19.0	26.00
9	45.38	11.58	2.509	0.31(0.07)	0.21	19.0	27.00
10	46.04	12.30	2.423	0.31(0.07)	0.21	20.1	20.00
11	46.33	12.76	2.373	0.31(0.06)	0.21	20.7	23.00
12	46.34	12.78	2.371	0.31(0.06)	0.21	20.7	17.00
13	46.36	12.83	2.366	0.31(0.06)	0.21	20.8	29.00
14	46.60	13.53	2.295	0.31(0.06)	0.21	21.6	50.00
15	46.36	14.02	2.249	0.31(0.06)	0.21	22.0	34.00
16	46.32	14.09	2.242	0.31(0.06)	0.21	22.0	39.00
17	45.93	14.53	2.203	0.31(0.06)	0.21	22.2	24.00
18	43.09	17.85	1.958	0.31(0.06)	0.20	23.7	12.00
19	40.67	21.19	1.775	0.31(0.06)	0.20	25.0	32.00
20	40.20	21.58	1.756	0.31(0.06)	0.20	25.0	10.00
TOTAL AREA(ACRES) =			25.0				

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 46.60 Tc(MIN.) = 13.533
EFFECTIVE AREA(ACRES) = 21.60 AREA-AVERAGED Fm(INCH/HR) = 0.06
AREA-AVERAGED Fp(INCH/HR) = 0.31 AREA-AVERAGED Ap = 0.22
TOTAL AREA(ACRES) = 25.0
LONGEST FLOWPATH FROM NODE 10.00 TO NODE 47.00 = 2005.00 FEET.

****
FLOW PROCESS FROM NODE 47.00 TO NODE 47.00 IS CODE = 12

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

****
FLOW PROCESS FROM NODE 47.00 TO NODE 47.00 IS CODE = 1

>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 13.53
RAINFALL INTENSITY(INCH/HR) = 2.29
AREA-AVERAGED Fm(INCH/HR) = 0.06
AREA-AVERAGED Fp(INCH/HR) = 0.31
AREA-AVERAGED Ap = 0.21
EFFECTIVE STREAM AREA(ACRES) = 21.60
TOTAL STREAM AREA(ACRES) = 25.00
PEAK FLOW RATE(CFS) AT CONFLUENCE = 46.60

****
FLOW PROCESS FROM NODE 51.00 TO NODE 52.00 IS CODE = 21

```
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   140.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.70  DOWNSTREAM(FEET) =    166.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.386
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.018
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.64      0.30     0.350    56    8.39
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.68
  TOTAL AREA(ACRES) =      0.64   PEAK FLOW RATE(CFS) =      1.68

****************************************************************************
  FLOW PROCESS FROM NODE     52.00 TO NODE     47.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   156.00  DOWNSTREAM(FEET) =   149.90
  FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   2.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.74
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.68
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =    8.44
  LONGEST FLOWPATH FROM NODE     51.00 TO NODE     47.00 =     180.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     47.00 TO NODE     47.00 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.) =    8.44
  RAINFALL INTENSITY(INCH/HR) =   3.01
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.64
  TOTAL STREAM AREA(ACRES) =       0.64
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.68

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	41.94	8.93	2.911	0.31(0.07)	0.22	14.9	43.00
1	42.26	9.10	2.880	0.31(0.07)	0.22	15.2	45.00
1	42.94	9.50	2.811	0.31(0.07)	0.22	15.8	30.00
1	43.50	9.89	2.746	0.31(0.07)	0.22	16.5	38.00
1	44.03	10.29	2.684	0.31(0.07)	0.22	17.1	30.00
1	44.16	10.41	2.667	0.31(0.07)	0.22	17.3	36.00
1	45.09	11.30	2.544	0.31(0.07)	0.21	18.6	14.00
1	45.37	11.56	2.511	0.31(0.07)	0.21	19.0	26.00
1	45.38	11.58	2.509	0.31(0.07)	0.21	19.0	27.00
1	46.04	12.30	2.423	0.31(0.07)	0.21	20.1	20.00
1	46.33	12.76	2.373	0.31(0.06)	0.21	20.7	23.00
1	46.34	12.78	2.371	0.31(0.06)	0.21	20.7	17.00
1	46.36	12.83	2.366	0.31(0.06)	0.21	20.8	29.00
1	46.60	13.53	2.295	0.31(0.06)	0.21	21.6	50.00
1	46.36	14.02	2.249	0.31(0.06)	0.21	22.0	34.00
1	46.32	14.09	2.242	0.31(0.06)	0.21	22.0	39.00
1	45.93	14.53	2.203	0.31(0.06)	0.21	22.2	24.00
1	43.09	17.85	1.958	0.31(0.06)	0.20	23.7	12.00
1	40.67	21.19	1.775	0.31(0.06)	0.20	25.0	32.00
1	40.20	21.58	1.756	0.31(0.06)	0.20	25.0	10.00
2	1.68	8.44	3.007	0.30(0.10)	0.35	0.6	51.00

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	42.66	8.44	3.007	0.31(0.07)	0.22		14.7	51.00
2	43.57	8.93	2.911	0.31(0.07)	0.22		15.5	43.00
3	43.87	9.10	2.880	0.31(0.07)	0.22		15.8	45.00
4	44.50	9.50	2.811	0.31(0.07)	0.22		16.5	30.00
5	45.03	9.89	2.746	0.31(0.07)	0.22		17.1	38.00
6	45.52	10.29	2.684	0.31(0.07)	0.22		17.7	30.00
7	45.64	10.41	2.667	0.31(0.07)	0.22		17.9	36.00
8	46.50	11.30	2.544	0.31(0.07)	0.22		19.2	14.00
9	46.76	11.56	2.511	0.31(0.07)	0.22		19.6	26.00
10	46.77	11.58	2.509	0.31(0.07)	0.22		19.6	27.00
11	47.38	12.30	2.423	0.31(0.07)	0.22		20.7	20.00
12	47.64	12.76	2.373	0.31(0.07)	0.22		21.3	23.00
13	47.65	12.78	2.371	0.31(0.07)	0.22		21.3	17.00
14	47.67	12.83	2.366	0.31(0.07)	0.22		21.4	29.00
15	47.87	13.53	2.295	0.31(0.07)	0.21		22.2	50.00
16	47.60	14.02	2.249	0.31(0.07)	0.21		22.6	34.00
17	47.56	14.09	2.242	0.31(0.07)	0.21		22.6	39.00
18	47.14	14.53	2.203	0.31(0.07)	0.21		22.9	24.00
19	44.16	17.85	1.958	0.31(0.06)	0.21		24.4	12.00
20	41.64	21.19	1.775	0.31(0.06)	0.20		25.6	32.00
21	41.16	21.58	1.756	0.31(0.06)	0.20		25.6	10.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 47.87 Tc(MIN.) = 13.53
EFFECTIVE AREA(ACRES) = 22.24 AREA-AVERAGED Fm(INCH/HR) = 0.07

```
 AREA-AVERAGED Fp(INCH/HR) =  0.31  AREA-AVERAGED Ap =  0.21
 TOTAL AREA(ACRES) =       25.6
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     47.00 =    2005.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     47.00 TO NODE     53.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   149.80  DOWNSTREAM(FEET) =   149.70
 FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  51.0 INCH PIPE IS  38.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.16
 ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      47.87
 PIPE TRAVEL TIME(MIN.) =   0.40    Tc(MIN.) =   13.93
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     53.00 =    2105.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     53.00 TO NODE     53.00 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.) =   13.93
 RAINFALL INTENSITY(INCH/HR) =   2.26
 AREA-AVERAGED Fm(INCH/HR) =  0.07
 AREA-AVERAGED Fp(INCH/HR) =  0.31
 AREA-AVERAGED Ap =  0.21
 EFFECTIVE STREAM AREA(ACRES) =      22.24
 TOTAL STREAM AREA(ACRES) =      25.64
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      47.87

****************************************************************************
 FLOW PROCESS FROM NODE     38.00 TO NODE     54.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   265.00
 ELEVATION DATA: UPSTREAM(FEET) =    166.40  DOWNSTREAM(FEET) =    165.80

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.340
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.539
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 CONDOMINIUMS               B        0.80      0.30      0.350    56   11.34
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
 SUBAREA RUNOFF(CFS) =      1.75
```

```
  TOTAL AREA(ACRES) =      0.80   PEAK FLOW RATE(CFS) =      1.75

****************************************************************************
  FLOW PROCESS FROM NODE     54.00 TO NODE     53.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   149.80  DOWNSTREAM(FEET) =   149.70
  FLOW LENGTH(FEET) =    70.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   8.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.14
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.75
  PIPE TRAVEL TIME(MIN.) =   0.55    Tc(MIN.) =   11.89
  LONGEST FLOWPATH FROM NODE     38.00 TO NODE     53.00 =     335.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     53.00 TO NODE     53.00 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.) =   11.89
  RAINFALL INTENSITY(INCH/HR) =   2.47
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.80
  TOTAL STREAM AREA(ACRES) =       0.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.75

****************************************************************************
  FLOW PROCESS FROM NODE     55.00 TO NODE     56.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   130.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    166.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.214
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.860
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.19      0.30     0.350    56    9.21
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.47
  TOTAL AREA(ACRES) =      0.19   PEAK FLOW RATE(CFS) =      0.47
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     56.00 TO NODE     53.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   156.00  DOWNSTREAM(FEET) =   149.70
  FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   1.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.16
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.47
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    9.30
  LONGEST FLOWPATH FROM NODE     55.00 TO NODE     53.00 =     170.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     53.00 TO NODE     53.00 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.) =    9.30
  RAINFALL INTENSITY(INCH/HR) =   2.85
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.19
  TOTAL STREAM AREA(ACRES) =       0.19
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.47

  ** CONFLUENCE DATA **
   STREAM       Q      Tc    Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       42.66    8.86    2.925  0.31( 0.07) 0.22      14.7      51.00
      1       43.57    9.35    2.836  0.31( 0.07) 0.22      15.5      43.00
      1       43.87    9.52    2.807  0.31( 0.07) 0.22      15.8      45.00
      1       44.50    9.90    2.744  0.31( 0.07) 0.22      16.5      30.00
      1       45.03   10.30    2.684  0.31( 0.07) 0.22      17.1      38.00
      1       45.52   10.69    2.626  0.31( 0.07) 0.22      17.7      30.00
      1       45.64   10.81    2.610  0.31( 0.07) 0.22      17.9      36.00
      1       46.50   11.70    2.494  0.31( 0.07) 0.22      19.2      14.00
      1       46.76   11.96    2.462  0.31( 0.07) 0.22      19.6      26.00
      1       46.77   11.98    2.461  0.31( 0.07) 0.22      19.6      27.00
      1       47.38   12.70    2.379  0.31( 0.07) 0.22      20.7      20.00
      1       47.64   13.16    2.331  0.31( 0.07) 0.22      21.3      23.00
      1       47.65   13.18    2.329  0.31( 0.07) 0.22      21.3      17.00
      1       47.67   13.23    2.324  0.31( 0.07) 0.22      21.4      29.00
      1       47.87   13.93    2.257  0.31( 0.07) 0.21      22.2      50.00
      1       47.60   14.42    2.213  0.31( 0.07) 0.21      22.6      34.00
      1       47.56   14.49    2.207  0.31( 0.07) 0.21      22.6      39.00
      1       47.14   14.93    2.169  0.31( 0.07) 0.21      22.9      24.00
```

1	44.16	18.27	1.932	0.31(0.06)	0.21	24.4	12.00
1	41.64	21.60	1.755	0.31(0.06)	0.20	25.6	32.00
1	41.16	21.99	1.737	0.31(0.06)	0.20	25.6	10.00
2	1.75	11.89	2.472	0.30(0.11)	0.35	0.8	38.00
3	0.47	9.30	2.845	0.30(0.11)	0.35	0.2	55.00

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	44.67	8.86	2.925	0.31(0.07)	0.23	15.5	51.00
2	45.53	9.30	2.845	0.31(0.07)	0.23	16.3	55.00
3	45.63	9.35	2.836	0.31(0.07)	0.23	16.4	43.00
4	45.93	9.52	2.807	0.31(0.07)	0.23	16.7	45.00
5	46.59	9.90	2.744	0.31(0.07)	0.23	17.3	30.00
6	47.12	10.30	2.684	0.31(0.07)	0.23	18.0	38.00
7	47.63	10.69	2.626	0.31(0.07)	0.23	18.6	30.00
8	47.76	10.81	2.610	0.31(0.07)	0.23	18.8	36.00
9	48.65	11.70	2.494	0.31(0.07)	0.23	20.2	14.00
10	48.84	11.89	2.472	0.31(0.07)	0.22	20.5	38.00
11	48.91	11.96	2.462	0.31(0.07)	0.22	20.6	26.00
12	48.92	11.98	2.461	0.31(0.07)	0.22	20.6	27.00
13	49.45	12.70	2.379	0.31(0.07)	0.22	21.7	20.00
14	49.67	13.16	2.331	0.31(0.07)	0.22	22.3	23.00
15	49.68	13.18	2.329	0.31(0.07)	0.22	22.3	17.00
16	49.69	13.23	2.324	0.31(0.07)	0.22	22.4	29.00
17	49.83	13.93	2.257	0.31(0.07)	0.22	23.2	50.00
18	49.52	14.42	2.213	0.31(0.07)	0.22	23.6	34.00
19	49.47	14.49	2.207	0.31(0.07)	0.22	23.6	39.00
20	49.03	14.93	2.169	0.31(0.07)	0.22	23.9	24.00
21	45.82	18.27	1.932	0.31(0.06)	0.21	25.4	12.00
22	43.14	21.60	1.755	0.31(0.06)	0.21	26.6	32.00
23	42.65	21.99	1.737	0.31(0.06)	0.21	26.6	10.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 49.83 Tc(MIN.) = 13.93
EFFECTIVE AREA(ACRES) = 23.23 AREA-AVERAGED Fm(INCH/HR) = 0.07
AREA-AVERAGED Fp(INCH/HR) = 0.31 AREA-AVERAGED Ap = 0.22
TOTAL AREA(ACRES) = 26.6
LONGEST FLOWPATH FROM NODE 10.00 TO NODE 53.00 = 2105.00 FEET.

****
FLOW PROCESS FROM NODE 53.00 TO NODE 57.00 IS CODE = 31

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 149.70 DOWNSTREAM(FEET) = 149.10
FLOW LENGTH(FEET) = 280.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 45.0 INCH PIPE IS 33.8 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.60
ESTIMATED PIPE DIAMETER(INCH) = 45.00 NUMBER OF PIPES = 1

```
  PIPE-FLOW(CFS) =      49.83
  PIPE TRAVEL TIME(MIN.) =   0.83    Tc(MIN.) =   14.77
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     57.00 =    2385.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     58.00 TO NODE     57.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   240.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.60

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.853
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.752
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.46      0.30      0.350    56    9.85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.10
  TOTAL AREA(ACRES) =      0.46   PEAK FLOW RATE(CFS) =      1.10

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 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.) =    9.85
  RAINFALL INTENSITY(INCH/HR) =   2.75
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.46
  TOTAL STREAM AREA(ACRES) =       0.46
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.10

****************************************************************************
  FLOW PROCESS FROM NODE     59.00 TO NODE     57.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   265.00
```

```
 ELEVATION DATA: UPSTREAM(FEET) =    166.80  DOWNSTREAM(FEET) =    165.80

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.239
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.692
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 CONDOMINIUMS               B        0.57      0.30      0.350    56   10.24
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
 SUBAREA RUNOFF(CFS) =      1.33
 TOTAL AREA(ACRES) =      0.57   PEAK FLOW RATE(CFS) =      1.33

****************************************************************************
 FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 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.) =   10.24
 RAINFALL INTENSITY(INCH/HR) =   2.69
 AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.35
 EFFECTIVE STREAM AREA(ACRES) =       0.57
 TOTAL STREAM AREA(ACRES) =       0.57
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.33

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        1.10    9.85    2.752  0.30( 0.11) 0.35       0.5      58.00
     2        1.33   10.24    2.692  0.30( 0.11) 0.35       0.6      59.00

 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        2.40    9.85    2.752  0.30( 0.11) 0.35       1.0      58.00
     2        2.40   10.24    2.692  0.30( 0.11) 0.35       1.0      59.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       2.40    Tc(MIN.) =     9.85
 EFFECTIVE AREA(ACRES) =       1.01   AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
 TOTAL AREA(ACRES) =        1.0
 LONGEST FLOWPATH FROM NODE     59.00 TO NODE     57.00 =     265.00 FEET.

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

FLOW PROCESS FROM NODE 57.00 TO NODE 57.00 IS CODE = 11

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

==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2.40	9.85	2.752	0.30(0.11)	0.35	1.0	58.00
2	2.40	10.24	2.692	0.30(0.11)	0.35	1.0	59.00

LONGEST FLOWPATH FROM NODE 59.00 TO NODE 57.00 = 265.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	44.67	9.73	2.773	0.31(0.07)	0.23	15.5	51.00
2	45.53	10.14	2.707	0.31(0.07)	0.23	16.3	55.00
3	45.63	10.19	2.699	0.31(0.07)	0.23	16.4	43.00
4	45.93	10.36	2.674	0.31(0.07)	0.23	16.7	45.00
5	46.59	10.74	2.619	0.31(0.07)	0.23	17.3	30.00
6	47.12	11.13	2.566	0.31(0.07)	0.23	18.0	38.00
7	47.63	11.53	2.515	0.31(0.07)	0.23	18.6	30.00
8	47.76	11.65	2.500	0.31(0.07)	0.23	18.8	36.00
9	48.65	12.54	2.397	0.31(0.07)	0.23	20.2	14.00
10	48.84	12.72	2.377	0.31(0.07)	0.22	20.5	38.00
11	48.91	12.80	2.369	0.31(0.07)	0.22	20.6	26.00
12	48.92	12.81	2.368	0.31(0.07)	0.22	20.6	27.00
13	49.45	13.54	2.294	0.31(0.07)	0.22	21.7	20.00
14	49.67	14.00	2.251	0.31(0.07)	0.22	22.3	23.00
15	49.68	14.02	2.249	0.31(0.07)	0.22	22.3	17.00
16	49.69	14.06	2.244	0.31(0.07)	0.22	22.4	29.00
17	49.83	14.77	2.183	0.31(0.07)	0.22	23.2	50.00
18	49.52	15.25	2.142	0.31(0.07)	0.22	23.6	34.00
19	49.47	15.32	2.137	0.31(0.07)	0.22	23.6	39.00
20	49.03	15.76	2.103	0.31(0.07)	0.22	23.9	24.00
21	45.82	19.11	1.883	0.31(0.06)	0.21	25.4	12.00
22	43.14	22.47	1.716	0.31(0.06)	0.21	26.6	32.00
23	42.65	22.86	1.699	0.31(0.06)	0.21	26.6	10.00

LONGEST FLOWPATH FROM NODE 10.00 TO NODE 57.00 = 2385.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	47.06	9.73	2.773	0.30(0.07)	0.24	16.5	51.00
2	47.34	9.85	2.752	0.30(0.07)	0.24	16.7	58.00
3	47.93	10.14	2.707	0.30(0.07)	0.24	17.3	55.00
4	48.03	10.19	2.699	0.30(0.07)	0.24	17.4	43.00
5	48.11	10.24	2.692	0.30(0.07)	0.24	17.5	59.00
6	48.32	10.36	2.674	0.30(0.07)	0.24	17.7	45.00
7	48.92	10.74	2.619	0.31(0.07)	0.23	18.4	30.00
8	49.40	11.13	2.566	0.31(0.07)	0.23	19.0	38.00
9	49.87	11.53	2.515	0.31(0.07)	0.23	19.7	30.00
10	49.98	11.65	2.500	0.31(0.07)	0.23	19.9	36.00
11	50.78	12.54	2.397	0.31(0.07)	0.23	21.2	14.00

```
    12       50.95   12.72    2.377  0.31( 0.07) 0.23      21.5      38.00
    13       51.01   12.80    2.369  0.31( 0.07) 0.23      21.6      26.00
    14       51.02   12.81    2.368  0.31( 0.07) 0.23      21.6      27.00
    15       51.48   13.54    2.294  0.31( 0.07) 0.23      22.7      20.00
    16       51.66   14.00    2.251  0.31( 0.07) 0.23      23.3      23.00
    17       51.67   14.02    2.249  0.31( 0.07) 0.23      23.4      17.00
    18       51.68   14.06    2.244  0.31( 0.07) 0.23      23.4      29.00
    19       51.76   14.77    2.183  0.31( 0.07) 0.23      24.3      50.00
    20       51.41   15.25    2.142  0.31( 0.07) 0.22      24.6      34.00
    21       51.36   15.32    2.137  0.31( 0.07) 0.22      24.7      39.00
    22       50.88   15.76    2.103  0.31( 0.07) 0.22      24.9      24.00
    23       47.47   19.11    1.883  0.30( 0.07) 0.22      26.4      12.00
    24       44.64   22.47    1.716  0.30( 0.06) 0.21      27.7      32.00
    25       44.12   22.86    1.699  0.30( 0.06) 0.21      27.7      10.00
  TOTAL AREA(ACRES) =        27.7

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       51.76  Tc(MIN.) =   14.767
  EFFECTIVE AREA(ACRES) =     24.26  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.31  AREA-AVERAGED Ap =  0.23
  TOTAL AREA(ACRES) =       27.7
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     57.00 =    2385.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     60.00 TO NODE     61.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   200.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.00  DOWNSTREAM(FEET) =    166.20

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.043
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.891
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.27      0.30      0.350    56    9.04
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.68
```

```
  TOTAL AREA(ACRES) =      0.27   PEAK FLOW RATE(CFS) =      0.68

****************************************************************************
  FLOW PROCESS FROM NODE     61.00 TO NODE     62.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   166.20  DOWNSTREAM(FEET) =   165.30
  FLOW LENGTH(FEET) =   210.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   4.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.52
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.68
  PIPE TRAVEL TIME(MIN.) =   1.39    Tc(MIN.) =   10.43
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     62.00 =     410.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     62.00 TO NODE     62.00 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.) =   10.43
  RAINFALL INTENSITY(INCH/HR) =   2.66
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.27
  TOTAL STREAM AREA(ACRES) =       0.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.68

****************************************************************************
  FLOW PROCESS FROM NODE     63.00 TO NODE     62.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   270.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.984
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.731
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.70      0.30     0.350    56    9.98
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.65
  TOTAL AREA(ACRES) =      0.70   PEAK FLOW RATE(CFS) =      1.65
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     62.00 TO NODE     62.00 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.) =    9.98
  RAINFALL INTENSITY(INCH/HR) =   2.73
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.70
  TOTAL STREAM AREA(ACRES) =       0.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.65

****************************************************************************
  FLOW PROCESS FROM NODE     64.00 TO NODE     62.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   295.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   20.647
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  1.801
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  AGRICULTURAL FAIR COVER
  "PASTURE,IRRIGATED"        B        0.27      0.30     1.000    65   20.65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      0.36
  TOTAL AREA(ACRES) =      0.27   PEAK FLOW RATE(CFS) =      0.36

****************************************************************************
  FLOW PROCESS FROM NODE     62.00 TO NODE     62.00 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.) =   20.65
  RAINFALL INTENSITY(INCH/HR) =   1.80
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =       0.27
  TOTAL STREAM AREA(ACRES) =       0.27
```

```
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.36

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        0.68   10.43    2.663  0.30( 0.10) 0.35       0.3      60.00
      2        1.65    9.98    2.731  0.30( 0.11) 0.35       0.7      63.00
      3        0.36   20.65    1.801  0.30( 0.30) 1.00       0.3      64.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        2.61    9.98    2.731  0.30( 0.13) 0.43       1.1      63.00
      2        2.58   10.43    2.663  0.30( 0.13) 0.43       1.1      60.00
      3        1.88   20.65    1.801  0.30( 0.15) 0.49       1.2      64.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       2.61    Tc(MIN.) =     9.98
  EFFECTIVE AREA(ACRES) =       1.09   AREA-AVERAGED Fm(INCH/HR) =  0.13
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.43
  TOTAL AREA(ACRES) =        1.2
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     62.00 =     410.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     62.00 TO NODE     57.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   156.00  DOWNSTREAM(FEET) =   149.10
  FLOW LENGTH(FEET) =   245.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   5.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.21
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.61
  PIPE TRAVEL TIME(MIN.) =   0.57    Tc(MIN.) =   10.55
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     57.00 =     655.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 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        2.61   10.55    2.646  0.30( 0.13) 0.43       1.1      63.00
      2        2.58   11.00    2.584  0.30( 0.13) 0.43       1.1      60.00
      3        1.88   21.26    1.771  0.30( 0.15) 0.49       1.2      64.00
```

LONGEST FLOWPATH FROM NODE 60.00 TO NODE 57.00 = 655.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	47.06	9.73	2.773	0.30(0.07)	0.24	16.5	51.00
2	47.34	9.85	2.752	0.30(0.07)	0.24	16.7	58.00
3	47.93	10.14	2.707	0.30(0.07)	0.24	17.3	55.00
4	48.03	10.19	2.699	0.30(0.07)	0.24	17.4	43.00
5	48.11	10.24	2.692	0.30(0.07)	0.24	17.5	59.00
6	48.32	10.36	2.674	0.30(0.07)	0.24	17.7	45.00
7	48.92	10.74	2.619	0.31(0.07)	0.23	18.4	30.00
8	49.40	11.13	2.566	0.31(0.07)	0.23	19.0	38.00
9	49.87	11.53	2.515	0.31(0.07)	0.23	19.7	30.00
10	49.98	11.65	2.500	0.31(0.07)	0.23	19.9	36.00
11	50.78	12.54	2.397	0.31(0.07)	0.23	21.2	14.00
12	50.95	12.72	2.377	0.31(0.07)	0.23	21.5	38.00
13	51.01	12.80	2.369	0.31(0.07)	0.23	21.6	26.00
14	51.02	12.81	2.368	0.31(0.07)	0.23	21.6	27.00
15	51.48	13.54	2.294	0.31(0.07)	0.23	22.7	20.00
16	51.66	14.00	2.251	0.31(0.07)	0.23	23.3	23.00
17	51.67	14.02	2.249	0.31(0.07)	0.23	23.4	17.00
18	51.68	14.06	2.244	0.31(0.07)	0.23	23.4	29.00
19	51.76	14.77	2.183	0.31(0.07)	0.23	24.3	50.00
20	51.41	15.25	2.142	0.31(0.07)	0.22	24.6	34.00
21	51.36	15.32	2.137	0.31(0.07)	0.22	24.7	39.00
22	50.88	15.76	2.103	0.31(0.07)	0.22	24.9	24.00
23	47.47	19.11	1.883	0.30(0.07)	0.22	26.4	12.00
24	44.64	22.47	1.716	0.30(0.06)	0.21	27.7	32.00
25	44.12	22.86	1.699	0.30(0.06)	0.21	27.7	10.00

LONGEST FLOWPATH FROM NODE 10.00 TO NODE 57.00 = 2385.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	49.59	9.73	2.773	0.30(0.08)	0.25	17.5	51.00
2	49.88	9.85	2.752	0.30(0.08)	0.25	17.8	58.00
3	50.49	10.14	2.707	0.30(0.08)	0.25	18.3	55.00
4	50.60	10.19	2.699	0.30(0.08)	0.25	18.4	43.00
5	50.69	10.24	2.692	0.30(0.08)	0.25	18.5	59.00
6	50.90	10.36	2.674	0.30(0.08)	0.25	18.8	45.00
7	51.22	10.55	2.646	0.30(0.07)	0.25	19.1	63.00
8	51.51	10.74	2.619	0.30(0.07)	0.25	19.5	30.00
9	51.82	11.00	2.584	0.30(0.07)	0.25	19.9	60.00
10	51.97	11.13	2.566	0.30(0.07)	0.24	20.1	38.00
11	52.41	11.53	2.515	0.30(0.07)	0.24	20.8	30.00
12	52.52	11.65	2.500	0.30(0.07)	0.24	21.0	36.00
13	53.25	12.54	2.397	0.30(0.07)	0.24	22.3	14.00
14	53.41	12.72	2.377	0.30(0.07)	0.24	22.6	38.00
15	53.47	12.80	2.369	0.30(0.07)	0.24	22.8	26.00
16	53.47	12.81	2.368	0.30(0.07)	0.24	22.8	27.00
17	53.89	13.54	2.294	0.30(0.07)	0.24	23.9	20.00
18	54.04	14.00	2.251	0.30(0.07)	0.24	24.5	23.00
19	54.04	14.02	2.249	0.30(0.07)	0.24	24.5	17.00

```
    20       54.05   14.06    2.244  0.30( 0.07) 0.24      24.6      29.00
    21       54.08   14.77    2.183  0.30( 0.07) 0.24      25.4      50.00
    22       53.70   15.25    2.142  0.30( 0.07) 0.24      25.8      34.00
    23       53.64   15.32    2.137  0.30( 0.07) 0.23      25.8      39.00
    24       53.14   15.76    2.103  0.30( 0.07) 0.23      26.0      24.00
    25       49.50   19.11    1.883  0.30( 0.07) 0.23      27.6      12.00
    26       47.54   21.26    1.771  0.30( 0.07) 0.23      28.4      64.00
    27       46.46   22.47    1.716  0.30( 0.07) 0.22      28.9      32.00
    28       45.92   22.86    1.699  0.30( 0.07) 0.22      28.9      10.00
   TOTAL AREA(ACRES) =        28.9

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       54.08  Tc(MIN.) =   14.767
  EFFECTIVE AREA(ACRES) =     25.42  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.24
  TOTAL AREA(ACRES) =       28.9
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     57.00 =    2385.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.77
  RAINFALL INTENSITY(INCH/HR) =   2.18
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.24
  EFFECTIVE STREAM AREA(ACRES) =      25.42
  TOTAL STREAM AREA(ACRES) =      28.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      54.08

****************************************************************************
  FLOW PROCESS FROM NODE     65.00 TO NODE     66.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   135.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.70  DOWNSTREAM(FEET) =    166.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.205
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.056
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS             B        0.19      0.30      0.350    56    8.21
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.50
  TOTAL AREA(ACRES) =      0.19   PEAK FLOW RATE(CFS) =      0.50

****************************************************************************
  FLOW PROCESS FROM NODE     66.00 TO NODE     57.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   156.00  DOWNSTREAM(FEET) =   149.10
  FLOW LENGTH(FEET) =    45.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   1.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.25
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.50
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =    8.30
  LONGEST FLOWPATH FROM NODE     65.00 TO NODE     57.00 =     180.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 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.) =    8.30
  RAINFALL INTENSITY(INCH/HR) =   3.04
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.19
  TOTAL STREAM AREA(ACRES) =       0.19
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.50

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       49.59    9.73    2.773  0.30( 0.08) 0.25      17.5      51.00
      1       49.88    9.85    2.752  0.30( 0.08) 0.25      17.8      58.00
      1       50.49   10.14    2.707  0.30( 0.08) 0.25      18.3      55.00
      1       50.60   10.19    2.699  0.30( 0.08) 0.25      18.4      43.00
      1       50.69   10.24    2.692  0.30( 0.08) 0.25      18.5      59.00
      1       50.90   10.36    2.674  0.30( 0.08) 0.25      18.8      45.00
      1       51.22   10.55    2.646  0.30( 0.07) 0.25      19.1      63.00
      1       51.51   10.74    2.619  0.30( 0.07) 0.25      19.5      30.00
      1       51.82   11.00    2.584  0.30( 0.07) 0.25      19.9      60.00
      1       51.97   11.13    2.566  0.30( 0.07) 0.24      20.1      38.00
      1       52.41   11.53    2.515  0.30( 0.07) 0.24      20.8      30.00
```

1	52.52	11.65	2.500	0.30(0.07)	0.24	21.0	36.00
1	53.25	12.54	2.397	0.30(0.07)	0.24	22.3	14.00
1	53.41	12.72	2.377	0.30(0.07)	0.24	22.6	38.00
1	53.47	12.80	2.369	0.30(0.07)	0.24	22.8	26.00
1	53.47	12.81	2.368	0.30(0.07)	0.24	22.8	27.00
1	53.89	13.54	2.294	0.30(0.07)	0.24	23.9	20.00
1	54.04	14.00	2.251	0.30(0.07)	0.24	24.5	23.00
1	54.04	14.02	2.249	0.30(0.07)	0.24	24.5	17.00
1	54.05	14.06	2.244	0.30(0.07)	0.24	24.6	29.00
1	54.08	14.77	2.183	0.30(0.07)	0.24	25.4	50.00
1	53.70	15.25	2.142	0.30(0.07)	0.24	25.8	34.00
1	53.64	15.32	2.137	0.30(0.07)	0.23	25.8	39.00
1	53.14	15.76	2.103	0.30(0.07)	0.23	26.0	24.00
1	49.50	19.11	1.883	0.30(0.07)	0.23	27.6	12.00
1	47.54	21.26	1.771	0.30(0.07)	0.23	28.4	64.00
1	46.46	22.47	1.716	0.30(0.07)	0.22	28.9	32.00
1	45.92	22.86	1.699	0.30(0.07)	0.22	28.9	10.00
2	0.50	8.30	3.037	0.30(0.11)	0.35	0.2	65.00

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	46.95	8.30	3.037	0.30(0.08)	0.25	15.1	65.00
2	50.05	9.73	2.773	0.30(0.08)	0.25	17.7	51.00
3	50.33	9.85	2.752	0.30(0.08)	0.25	18.0	58.00
4	50.94	10.14	2.707	0.30(0.08)	0.25	18.5	55.00
5	51.04	10.19	2.699	0.30(0.08)	0.25	18.6	43.00
6	51.13	10.24	2.692	0.30(0.08)	0.25	18.7	59.00
7	51.35	10.36	2.674	0.30(0.08)	0.25	19.0	45.00
8	51.66	10.55	2.646	0.30(0.08)	0.25	19.3	63.00
9	51.94	10.74	2.619	0.30(0.08)	0.25	19.7	30.00
10	52.24	11.00	2.584	0.30(0.07)	0.25	20.1	60.00
11	52.40	11.13	2.566	0.30(0.07)	0.25	20.3	38.00
12	52.82	11.53	2.515	0.30(0.07)	0.25	21.0	30.00
13	52.93	11.65	2.500	0.30(0.07)	0.24	21.2	36.00
14	53.65	12.54	2.397	0.30(0.07)	0.24	22.5	14.00
15	53.80	12.72	2.377	0.30(0.07)	0.24	22.8	38.00
16	53.86	12.80	2.369	0.30(0.07)	0.24	22.9	26.00
17	53.86	12.81	2.368	0.30(0.07)	0.24	23.0	27.00
18	54.27	13.54	2.294	0.30(0.07)	0.24	24.0	20.00
19	54.41	14.00	2.251	0.30(0.07)	0.24	24.7	23.00
20	54.41	14.02	2.249	0.30(0.07)	0.24	24.7	17.00
21	54.42	14.06	2.244	0.30(0.07)	0.24	24.8	29.00
22	54.44	14.77	2.183	0.30(0.07)	0.24	25.6	50.00
23	54.05	15.25	2.142	0.30(0.07)	0.24	26.0	34.00
24	53.99	15.32	2.137	0.30(0.07)	0.24	26.0	39.00
25	53.48	15.76	2.103	0.30(0.07)	0.24	26.2	24.00
26	49.81	19.11	1.883	0.30(0.07)	0.23	27.8	12.00
27	47.83	21.26	1.771	0.30(0.07)	0.23	28.6	64.00
28	46.73	22.47	1.716	0.30(0.07)	0.22	29.1	32.00
29	46.20	22.86	1.699	0.30(0.07)	0.22	29.1	10.00

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      54.44    Tc(MIN.) =    14.77
  EFFECTIVE AREA(ACRES) =      25.61   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.24
  TOTAL AREA(ACRES) =       29.1
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     57.00 =    2385.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     67.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   149.10  DOWNSTREAM(FEET) =   148.50
  FLOW LENGTH(FEET) =   275.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  45.0 INCH PIPE IS  36.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.68
  ESTIMATED PIPE DIAMETER(INCH) =  45.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      54.44
  PIPE TRAVEL TIME(MIN.) =   0.81    Tc(MIN.) =   15.57
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     67.00 =    2660.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     67.00 TO NODE     67.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     68.00 TO NODE     69.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   365.00
  ELEVATION DATA: UPSTREAM(FEET) =    168.20  DOWNSTREAM(FEET) =    167.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.404
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.531
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  APARTMENTS                 B        1.00      0.30     0.200    56   11.40
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      2.22
  TOTAL AREA(ACRES) =      1.00   PEAK FLOW RATE(CFS) =      2.22

****************************************************************************
  FLOW PROCESS FROM NODE     69.00 TO NODE     70.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   162.00  DOWNSTREAM(FEET) =   159.00
  FLOW LENGTH(FEET) =   185.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.64
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.22
  PIPE TRAVEL TIME(MIN.) =   0.55    Tc(MIN.) =   11.95
  LONGEST FLOWPATH FROM NODE     68.00 TO NODE     70.00 =     550.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     71.00 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.) =   11.95
  RAINFALL INTENSITY(INCH/HR) =   2.46
  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       1.00
  TOTAL STREAM AREA(ACRES) =       1.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.22

****************************************************************************
  FLOW PROCESS FROM NODE     71.00 TO NODE     70.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   250.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.20  DOWNSTREAM(FEET) =    166.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.688
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.627
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  APARTMENTS                 B        0.66      0.30      0.200    56   10.69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      1.52
  TOTAL AREA(ACRES) =      0.66   PEAK FLOW RATE(CFS) =      1.52

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     70.00 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.) =   10.69
  RAINFALL INTENSITY(INCH/HR) =   2.63
  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       0.66
  TOTAL STREAM AREA(ACRES) =       0.66
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.52

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        2.22   11.95    2.464  0.30( 0.06) 0.20       1.0      68.00
      2        1.52   10.69    2.627  0.30( 0.06) 0.20       0.7      71.00

  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        3.65   10.69    2.627  0.30( 0.06) 0.20       1.6      71.00
      2        3.65   11.95    2.464  0.30( 0.06) 0.20       1.7      68.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       3.65    Tc(MIN.) =    11.95
  EFFECTIVE AREA(ACRES) =       1.66   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.20
  TOTAL AREA(ACRES) =        1.7
  LONGEST FLOWPATH FROM NODE     68.00 TO NODE     70.00 =     550.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     70.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     72.00 TO NODE     73.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   230.00
  ELEVATION DATA: UPSTREAM(FEET) =    168.00  DOWNSTREAM(FEET) =    166.80
```

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.161
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  3.066
  SUBAREA Tc 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        0.28      0.30     0.200    56    8.16
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      0.76
  TOTAL AREA(ACRES) =      0.28   PEAK FLOW RATE(CFS) =      0.76

****************************************************************************
  FLOW PROCESS FROM NODE     73.00 TO NODE     70.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   160.00  DOWNSTREAM(FEET) =   159.00
  FLOW LENGTH(FEET) =   270.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   5.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.47
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.76
  PIPE TRAVEL TIME(MIN.) =   1.82    Tc(MIN.) =    9.98
  LONGEST FLOWPATH FROM NODE     72.00 TO NODE     70.00 =     500.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     70.00 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.) =    9.98
  RAINFALL INTENSITY(INCH/HR) =   2.73
  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       0.28
  TOTAL STREAM AREA(ACRES) =       0.28
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.76

****************************************************************************
  FLOW PROCESS FROM NODE     72.00 TO NODE     70.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   390.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.20  DOWNSTREAM(FEET) =    166.80

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

```
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.956
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.254
  SUBAREA Tc 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        1.49      0.30     0.200    56   13.96
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      2.94
  TOTAL AREA(ACRES) =      1.49   PEAK FLOW RATE(CFS) =      2.94

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     70.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.96
  RAINFALL INTENSITY(INCH/HR) =   2.25
  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       1.49
  TOTAL STREAM AREA(ACRES) =       1.49
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.94

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        0.76    9.98    2.731  0.30( 0.06) 0.20       0.3      72.00
      2        2.94   13.96    2.254  0.30( 0.06) 0.20       1.5      72.00

  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        3.32    9.98    2.731  0.30( 0.06) 0.20       1.3      72.00
      2        3.56   13.96    2.254  0.30( 0.06) 0.20       1.8      72.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       3.56    Tc(MIN.) =    13.96
  EFFECTIVE AREA(ACRES) =       1.77   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.20
  TOTAL AREA(ACRES) =        1.8
  LONGEST FLOWPATH FROM NODE     72.00 TO NODE     70.00 =     500.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     70.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 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        3.32    9.98    2.731  0.30( 0.06) 0.20       1.3      72.00
      2        3.56   13.96    2.254  0.30( 0.06) 0.20       1.8      72.00
  LONGEST FLOWPATH FROM NODE     72.00 TO NODE     70.00 =     500.00 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        3.65   10.69    2.627  0.30( 0.06) 0.20       1.6      71.00
      2        3.65   11.95    2.464  0.30( 0.06) 0.20       1.7      68.00
  LONGEST FLOWPATH FROM NODE     68.00 TO NODE     70.00 =     550.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        6.87    9.98    2.731  0.30( 0.06) 0.20       2.8      72.00
      2        7.01   10.69    2.627  0.30( 0.06) 0.20       3.0      71.00
      3        7.09   11.95    2.464  0.30( 0.06) 0.20       3.2      68.00
      4        6.90   13.96    2.254  0.30( 0.06) 0.20       3.4      72.00
    TOTAL AREA(ACRES) =         3.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =        7.09  Tc(MIN.) =   11.951
  EFFECTIVE AREA(ACRES) =      3.22  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.20
  TOTAL AREA(ACRES) =        3.4
  LONGEST FLOWPATH FROM NODE     68.00 TO NODE     70.00 =     550.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     70.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     67.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   155.00  DOWNSTREAM(FEET) =   148.50
  FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   5.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  19.90
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.09
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =   11.98
  LONGEST FLOWPATH FROM NODE     68.00 TO NODE     67.00 =     580.00 FEET.
```

```
****************************************************************************
 FLOW PROCESS FROM NODE     67.00 TO NODE     67.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================
```

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	6.87	10.01	2.727	0.30(0.06)	0.20	2.8	72.00
2	7.01	10.71	2.623	0.30(0.06)	0.20	3.0	71.00
3	7.09	11.98	2.461	0.30(0.06)	0.20	3.2	68.00
4	6.90	13.98	2.252	0.30(0.06)	0.20	3.4	72.00

LONGEST FLOWPATH FROM NODE 68.00 TO NODE 67.00 = 580.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	46.95	9.11	2.878	0.30(0.08)	0.25	15.1	65.00
2	50.05	10.54	2.648	0.30(0.08)	0.25	17.7	51.00
3	50.33	10.66	2.630	0.30(0.08)	0.25	18.0	58.00
4	50.94	10.95	2.591	0.30(0.08)	0.25	18.5	55.00
5	51.04	11.00	2.584	0.30(0.08)	0.25	18.6	43.00
6	51.13	11.05	2.577	0.30(0.08)	0.25	18.7	59.00
7	51.35	11.17	2.561	0.30(0.08)	0.25	19.0	45.00
8	51.66	11.36	2.537	0.30(0.08)	0.25	19.3	63.00
9	51.94	11.55	2.512	0.30(0.08)	0.25	19.7	30.00
10	52.24	11.81	2.481	0.30(0.07)	0.25	20.1	60.00
11	52.40	11.94	2.465	0.30(0.07)	0.25	20.3	38.00
12	52.82	12.34	2.419	0.30(0.07)	0.25	21.0	30.00
13	52.93	12.46	2.406	0.30(0.07)	0.24	21.2	36.00
14	53.65	13.34	2.313	0.30(0.07)	0.24	22.5	14.00
15	53.80	13.53	2.295	0.30(0.07)	0.24	22.8	38.00
16	53.86	13.61	2.287	0.30(0.07)	0.24	22.9	26.00
17	53.86	13.62	2.286	0.30(0.07)	0.24	23.0	27.00
18	54.27	14.34	2.219	0.30(0.07)	0.24	24.0	20.00
19	54.41	14.80	2.180	0.30(0.07)	0.24	24.7	23.00
20	54.41	14.82	2.178	0.30(0.07)	0.24	24.7	17.00
21	54.42	14.87	2.174	0.30(0.07)	0.24	24.8	29.00
22	54.44	15.57	2.117	0.30(0.07)	0.24	25.6	50.00
23	54.05	16.06	2.080	0.30(0.07)	0.24	26.0	34.00
24	53.99	16.13	2.075	0.30(0.07)	0.24	26.0	39.00
25	53.48	16.57	2.043	0.30(0.07)	0.24	26.2	24.00
26	49.81	19.92	1.838	0.30(0.07)	0.23	27.8	12.00
27	47.83	22.08	1.733	0.30(0.07)	0.23	28.6	64.00
28	46.73	23.29	1.681	0.30(0.07)	0.22	29.1	32.00
29	46.20	23.68	1.665	0.30(0.07)	0.22	29.1	10.00

LONGEST FLOWPATH FROM NODE 10.00 TO NODE 67.00 = 2660.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	53.55	9.11	2.878	0.30(0.07)	0.24	17.7	65.00
2	55.76	10.01	2.727	0.30(0.07)	0.24	19.5	72.00

```
      3       57.02   10.54    2.648  0.30( 0.07) 0.24      20.6      51.00
      4       57.33   10.66    2.630  0.30( 0.07) 0.24      20.9      58.00
      5       57.45   10.71    2.623  0.30( 0.07) 0.24      21.0      71.00
      6       57.97   10.95    2.591  0.30( 0.07) 0.24      21.6      55.00
      7       58.07   11.00    2.584  0.30( 0.07) 0.24      21.7      43.00
      8       58.17   11.05    2.577  0.30( 0.07) 0.24      21.8      59.00
      9       58.39   11.17    2.561  0.30( 0.07) 0.24      22.0      45.00
     10       58.71   11.36    2.537  0.30( 0.07) 0.24      22.4      63.00
     11       59.01   11.55    2.512  0.30( 0.07) 0.24      22.8      30.00
     12       59.32   11.81    2.481  0.30( 0.07) 0.24      23.3      60.00
     13       59.49   11.94    2.465  0.30( 0.07) 0.24      23.5      38.00
     14       59.53   11.98    2.461  0.30( 0.07) 0.24      23.6      68.00
     15       59.88   12.34    2.419  0.30( 0.07) 0.24      24.2      30.00
     16       59.98   12.46    2.406  0.30( 0.07) 0.24      24.4      36.00
     17       60.61   13.34    2.313  0.30( 0.07) 0.24      25.9      14.00
     18       60.74   13.53    2.295  0.30( 0.07) 0.24      26.2      38.00
     19       60.79   13.61    2.287  0.30( 0.07) 0.24      26.3      26.00
     20       60.80   13.62    2.286  0.30( 0.07) 0.24      26.4      27.00
     21       60.96   13.98    2.252  0.30( 0.07) 0.24      26.9      72.00
     22       61.06   14.34    2.219  0.30( 0.07) 0.24      27.5      20.00
     23       61.08   14.80    2.180  0.30( 0.07) 0.23      28.1      23.00
     24       61.07   14.82    2.178  0.30( 0.07) 0.23      28.1      17.00
     25       61.07   14.87    2.174  0.30( 0.07) 0.23      28.2      29.00
     26       60.91   15.57    2.117  0.30( 0.07) 0.23      29.0      50.00
     27       60.41   16.06    2.080  0.30( 0.07) 0.23      29.4      34.00
     28       60.34   16.13    2.075  0.30( 0.07) 0.23      29.4      39.00
     29       59.72   16.57    2.043  0.30( 0.07) 0.23      29.7      24.00
     30       55.40   19.92    1.838  0.30( 0.07) 0.23      31.2      12.00
     31       53.09   22.08    1.733  0.30( 0.07) 0.22      32.1      64.00
     32       51.83   23.29    1.681  0.30( 0.07) 0.22      32.5      32.00
     33       51.25   23.68    1.665  0.30( 0.07) 0.22      32.5      10.00
   TOTAL AREA(ACRES) =        32.5

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       61.08  Tc(MIN.) =   14.802
  EFFECTIVE AREA(ACRES) =     28.10  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.23
  TOTAL AREA(ACRES) =       32.5
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     67.00 =    2660.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     67.00 TO NODE     74.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   148.50  DOWNSTREAM(FEET) =   148.00
  FLOW LENGTH(FEET) =   280.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  51.0 INCH PIPE IS  37.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.53
  ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      61.08
  PIPE TRAVEL TIME(MIN.) =   0.84    Tc(MIN.) =   15.65
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     74.00 =    2940.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     74.00 TO NODE     74.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     75.00 TO NODE     76.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   275.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.00  DOWNSTREAM(FEET) =    165.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.415
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.825
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.70      0.30     0.350    56    9.41
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.71
  TOTAL AREA(ACRES) =      0.70   PEAK FLOW RATE(CFS) =      1.71

****************************************************************************
  FLOW PROCESS FROM NODE     76.00 TO NODE     76.00 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.) =    9.41
  RAINFALL INTENSITY(INCH/HR) =   2.82
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.70
  TOTAL STREAM AREA(ACRES) =       0.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.71

****************************************************************************
  FLOW PROCESS FROM NODE     77.00 TO NODE     76.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   255.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.00  DOWNSTREAM(FEET) =    166.30

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

```
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.745
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.619
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS              B        0.51      0.30     0.350    56   10.75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.15
  TOTAL AREA(ACRES) =      0.51   PEAK FLOW RATE(CFS) =      1.15

****************************************************************************
  FLOW PROCESS FROM NODE     76.00 TO NODE     76.00 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.) =   10.75
  RAINFALL INTENSITY(INCH/HR) =   2.62
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.51
  TOTAL STREAM AREA(ACRES) =       0.51
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.15

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        1.71    9.41    2.825  0.30( 0.11) 0.35       0.7      75.00
      2        1.15   10.75    2.619  0.30( 0.11) 0.35       0.5      77.00

  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        2.81    9.41    2.825  0.30( 0.11) 0.35       1.1      75.00
      2        2.74   10.75    2.619  0.30( 0.10) 0.35       1.2      77.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       2.81    Tc(MIN.) =     9.41
  EFFECTIVE AREA(ACRES) =       1.15   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        1.2
  LONGEST FLOWPATH FROM NODE     75.00 TO NODE     76.00 =     275.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     76.00 TO NODE     79.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   154.00  DOWNSTREAM(FEET) =   152.00
  FLOW LENGTH(FEET) =   300.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   9.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.12
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.81
  PIPE TRAVEL TIME(MIN.) =   1.21    Tc(MIN.) =   10.63
  LONGEST FLOWPATH FROM NODE     75.00 TO NODE     79.00 =     575.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     79.00 TO NODE     79.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.63
  RAINFALL INTENSITY(INCH/HR) =   2.64
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       1.15
  TOTAL STREAM AREA(ACRES) =       1.21
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.81

****************************************************************************
  FLOW PROCESS FROM NODE     78.00 TO NODE     79.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   200.00
  ELEVATION DATA: UPSTREAM(FEET) =    165.90  DOWNSTREAM(FEET) =    165.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.578
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.797
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.40      0.30      0.350    56    9.58
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.97
  TOTAL AREA(ACRES) =      0.40   PEAK FLOW RATE(CFS) =      0.97

****************************************************************************
  FLOW PROCESS FROM NODE     79.00 TO NODE     79.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
```

```
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.58
 RAINFALL INTENSITY(INCH/HR) =   2.80
 AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.35
 EFFECTIVE STREAM AREA(ACRES) =       0.40
 TOTAL STREAM AREA(ACRES) =       0.40
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.97

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1        2.81   10.63    2.635  0.30( 0.11) 0.35       1.1      75.00
     1        2.74   11.96    2.463  0.30( 0.10) 0.35       1.2      77.00
     2        0.97    9.58    2.797  0.30( 0.11) 0.35       0.4      78.00

 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        3.66    9.58    2.797  0.30( 0.11) 0.35       1.4      78.00
     2        3.72   10.63    2.635  0.30( 0.11) 0.35       1.5      75.00
     3        3.59   11.96    2.463  0.30( 0.10) 0.35       1.6      77.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       3.72    Tc(MIN.) =    10.63
 EFFECTIVE AREA(ACRES) =       1.55   AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
 TOTAL AREA(ACRES) =        1.6
 LONGEST FLOWPATH FROM NODE     75.00 TO NODE     79.00 =     575.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     79.00 TO NODE     74.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   152.00  DOWNSTREAM(FEET) =   148.00
 FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   5.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  11.64
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       3.72
 PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =   10.70
 LONGEST FLOWPATH FROM NODE     75.00 TO NODE     74.00 =     625.00 FEET.

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 FLOW PROCESS FROM NODE     74.00 TO NODE     74.00 IS CODE =  11
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>>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<

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** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3.66	9.65	2.785	0.30(0.11)	0.35	1.4	78.00
2	3.72	10.70	2.625	0.30(0.11)	0.35	1.5	75.00
3	3.59	12.03	2.454	0.30(0.10)	0.35	1.6	77.00

LONGEST FLOWPATH FROM NODE 75.00 TO NODE 74.00 = 625.00 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	53.55	9.99	2.730	0.30(0.07)	0.24	17.7	65.00
2	55.76	10.88	2.600	0.30(0.07)	0.24	19.5	72.00
3	57.02	11.41	2.531	0.30(0.07)	0.24	20.6	51.00
4	57.33	11.53	2.515	0.30(0.07)	0.24	20.9	58.00
5	57.45	11.58	2.508	0.30(0.07)	0.24	21.0	71.00
6	57.97	11.82	2.480	0.30(0.07)	0.24	21.6	55.00
7	58.07	11.87	2.473	0.30(0.07)	0.24	21.7	43.00
8	58.17	11.92	2.468	0.30(0.07)	0.24	21.8	59.00
9	58.39	12.04	2.454	0.30(0.07)	0.24	22.0	45.00
10	58.71	12.23	2.432	0.30(0.07)	0.24	22.4	63.00
11	59.01	12.42	2.410	0.30(0.07)	0.24	22.8	30.00
12	59.32	12.66	2.384	0.30(0.07)	0.24	23.3	60.00
13	59.49	12.79	2.370	0.30(0.07)	0.24	23.5	38.00
14	59.53	12.82	2.366	0.30(0.07)	0.24	23.6	68.00
15	59.88	13.19	2.329	0.30(0.07)	0.24	24.2	30.00
16	59.98	13.30	2.317	0.30(0.07)	0.24	24.4	36.00
17	60.61	14.19	2.233	0.30(0.07)	0.24	25.9	14.00
18	60.74	14.37	2.217	0.30(0.07)	0.24	26.2	38.00
19	60.79	14.45	2.210	0.30(0.07)	0.24	26.3	26.00
20	60.80	14.46	2.209	0.30(0.07)	0.24	26.4	27.00
21	60.96	14.83	2.178	0.30(0.07)	0.24	26.9	72.00
22	61.06	15.19	2.148	0.30(0.07)	0.24	27.5	20.00
23	61.08	15.65	2.111	0.30(0.07)	0.23	28.1	23.00
24	61.07	15.67	2.110	0.30(0.07)	0.23	28.1	17.00
25	61.07	15.72	2.106	0.30(0.07)	0.23	28.2	29.00
26	60.91	16.42	2.054	0.30(0.07)	0.23	29.0	50.00
27	60.41	16.91	2.020	0.30(0.07)	0.23	29.4	34.00
28	60.34	16.97	2.015	0.30(0.07)	0.23	29.4	39.00
29	59.72	17.42	1.986	0.30(0.07)	0.23	29.7	24.00
30	55.40	20.80	1.794	0.30(0.07)	0.23	31.2	12.00
31	53.09	22.96	1.695	0.30(0.07)	0.22	32.1	64.00
32	51.83	24.17	1.646	0.30(0.07)	0.22	32.5	32.00
33	51.25	24.56	1.631	0.30(0.07)	0.22	32.5	10.00

LONGEST FLOWPATH FROM NODE 10.00 TO NODE 74.00 = 2940.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	56.46	9.65	2.785	0.30(0.08)	0.25	18.5	78.00
2	57.23	9.99	2.730	0.30(0.08)	0.25	19.1	65.00

3	59.03	10.70	2.625	0.30(0.08)	0.25	20.7	75.00
4	59.46	10.88	2.600	0.30(0.08)	0.25	21.1	72.00
5	60.67	11.41	2.531	0.30(0.08)	0.25	22.2	51.00
6	60.97	11.53	2.515	0.30(0.08)	0.25	22.5	58.00
7	61.08	11.58	2.508	0.30(0.08)	0.25	22.6	71.00
8	61.58	11.82	2.480	0.30(0.08)	0.25	23.2	55.00
9	61.68	11.87	2.473	0.30(0.08)	0.25	23.3	43.00
10	61.76	11.92	2.468	0.30(0.08)	0.25	23.4	59.00
11	61.96	12.03	2.454	0.30(0.08)	0.25	23.6	77.00
12	61.97	12.04	2.454	0.30(0.08)	0.25	23.6	45.00
13	62.26	12.23	2.432	0.30(0.08)	0.25	24.0	63.00
14	62.53	12.42	2.410	0.30(0.08)	0.25	24.4	30.00
15	62.80	12.66	2.384	0.30(0.08)	0.25	24.9	60.00
16	62.95	12.79	2.370	0.30(0.07)	0.25	25.1	38.00
17	62.98	12.82	2.366	0.30(0.07)	0.25	25.2	68.00
18	63.28	13.19	2.329	0.30(0.07)	0.25	25.8	30.00
19	63.35	13.30	2.317	0.30(0.07)	0.25	26.0	36.00
20	63.86	14.19	2.233	0.30(0.07)	0.24	27.5	14.00
21	63.97	14.37	2.217	0.30(0.07)	0.24	27.8	38.00
22	64.00	14.45	2.210	0.30(0.07)	0.24	27.9	26.00
23	64.01	14.46	2.209	0.30(0.07)	0.24	28.0	27.00
24	64.13	14.83	2.178	0.30(0.07)	0.24	28.5	72.00
25	64.18	15.19	2.148	0.30(0.07)	0.24	29.1	20.00
26	64.14	15.65	2.111	0.30(0.07)	0.24	29.7	23.00
27	64.13	15.67	2.110	0.30(0.07)	0.24	29.7	17.00
28	64.12	15.72	2.106	0.30(0.07)	0.24	29.8	29.00
29	63.89	16.42	2.054	0.30(0.07)	0.24	30.6	50.00
30	63.33	16.91	2.020	0.30(0.07)	0.24	31.0	34.00
31	63.25	16.97	2.015	0.30(0.07)	0.24	31.1	39.00
32	62.59	17.42	1.986	0.30(0.07)	0.24	31.3	24.00
33	57.98	20.80	1.794	0.30(0.07)	0.23	32.8	12.00
34	55.52	22.96	1.695	0.30(0.07)	0.23	33.7	64.00
35	54.19	24.17	1.646	0.30(0.07)	0.23	34.1	32.00
36	53.58	24.56	1.631	0.30(0.07)	0.23	34.1	10.00
TOTAL AREA(ACRES) =		34.1					

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 64.18 Tc(MIN.) = 15.187
EFFECTIVE AREA(ACRES) = 29.08 AREA-AVERAGED Fm(INCH/HR) = 0.07
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.24
TOTAL AREA(ACRES) = 34.1
LONGEST FLOWPATH FROM NODE 10.00 TO NODE 74.00 = 2940.00 FEET.

****
FLOW PROCESS FROM NODE 74.00 TO NODE 74.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 3 <<<<<
==

****
FLOW PROCESS FROM NODE 74.00 TO NODE 74.00 IS CODE = 1

>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==

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  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.19
  RAINFALL INTENSITY(INCH/HR) =   2.15
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.24
  EFFECTIVE STREAM AREA(ACRES) =      29.08
  TOTAL STREAM AREA(ACRES) =      34.13
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      64.18

****************************************************************************
  FLOW PROCESS FROM NODE     59.00 TO NODE     74.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.80  DOWNSTREAM(FEET) =    165.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.807
  *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.760
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.41      0.30     0.350    56    9.81
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.98
  TOTAL AREA(ACRES) =      0.41   PEAK FLOW RATE(CFS) =      0.98

****************************************************************************
  FLOW PROCESS FROM NODE     74.00 TO NODE     74.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.81
  RAINFALL INTENSITY(INCH/HR) =   2.76
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.41
  TOTAL STREAM AREA(ACRES) =       0.41
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.98

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       56.46    9.65    2.785  0.30( 0.08) 0.25      18.5      78.00
      1       57.23    9.99    2.730  0.30( 0.08) 0.25      19.1      65.00
```

1	59.03	10.70	2.625	0.30(0.08)	0.25	20.7	75.00
1	59.46	10.88	2.600	0.30(0.08)	0.25	21.1	72.00
1	60.67	11.41	2.531	0.30(0.08)	0.25	22.2	51.00
1	60.97	11.53	2.515	0.30(0.08)	0.25	22.5	58.00
1	61.08	11.58	2.508	0.30(0.08)	0.25	22.6	71.00
1	61.58	11.82	2.480	0.30(0.08)	0.25	23.2	55.00
1	61.68	11.87	2.473	0.30(0.08)	0.25	23.3	43.00
1	61.76	11.92	2.468	0.30(0.08)	0.25	23.4	59.00
1	61.96	12.03	2.454	0.30(0.08)	0.25	23.6	77.00
1	61.97	12.04	2.454	0.30(0.08)	0.25	23.6	45.00
1	62.26	12.23	2.432	0.30(0.08)	0.25	24.0	63.00
1	62.53	12.42	2.410	0.30(0.08)	0.25	24.4	30.00
1	62.80	12.66	2.384	0.30(0.08)	0.25	24.9	60.00
1	62.95	12.79	2.370	0.30(0.07)	0.25	25.1	38.00
1	62.98	12.82	2.366	0.30(0.07)	0.25	25.2	68.00
1	63.28	13.19	2.329	0.30(0.07)	0.25	25.8	30.00
1	63.35	13.30	2.317	0.30(0.07)	0.25	26.0	36.00
1	63.86	14.19	2.233	0.30(0.07)	0.24	27.5	14.00
1	63.97	14.37	2.217	0.30(0.07)	0.24	27.8	38.00
1	64.00	14.45	2.210	0.30(0.07)	0.24	27.9	26.00
1	64.01	14.46	2.209	0.30(0.07)	0.24	28.0	27.00
1	64.13	14.83	2.178	0.30(0.07)	0.24	28.5	72.00
1	64.18	15.19	2.148	0.30(0.07)	0.24	29.1	20.00
1	64.14	15.65	2.111	0.30(0.07)	0.24	29.7	23.00
1	64.13	15.67	2.110	0.30(0.07)	0.24	29.7	17.00
1	64.12	15.72	2.106	0.30(0.07)	0.24	29.8	29.00
1	63.89	16.42	2.054	0.30(0.07)	0.24	30.6	50.00
1	63.33	16.91	2.020	0.30(0.07)	0.24	31.0	34.00
1	63.25	16.97	2.015	0.30(0.07)	0.24	31.1	39.00
1	62.59	17.42	1.986	0.30(0.07)	0.24	31.3	24.00
1	57.98	20.80	1.794	0.30(0.07)	0.23	32.8	12.00
1	55.52	22.96	1.695	0.30(0.07)	0.23	33.7	64.00
1	54.19	24.17	1.646	0.30(0.07)	0.23	34.1	32.00
1	53.58	24.56	1.631	0.30(0.07)	0.23	34.1	10.00
2	0.98	9.81	2.760	0.30(0.11)	0.35	0.4	59.00

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	57.43	9.65	2.785	0.30(0.08)	0.25	18.9	78.00
2	57.79	9.81	2.760	0.30(0.08)	0.25	19.2	59.00
3	58.20	9.99	2.730	0.30(0.08)	0.25	19.5	65.00
4	59.96	10.70	2.625	0.30(0.08)	0.25	21.1	75.00
5	60.38	10.88	2.600	0.30(0.08)	0.25	21.5	72.00
6	61.56	11.41	2.531	0.30(0.08)	0.25	22.6	51.00
7	61.86	11.53	2.515	0.30(0.08)	0.25	22.9	58.00
8	61.96	11.58	2.508	0.30(0.08)	0.25	23.0	71.00
9	62.45	11.82	2.480	0.30(0.08)	0.25	23.6	55.00
10	62.55	11.87	2.473	0.30(0.08)	0.25	23.7	43.00
11	62.63	11.92	2.468	0.30(0.08)	0.25	23.8	59.00
12	62.83	12.03	2.454	0.30(0.08)	0.25	24.0	77.00

13	62.84	12.04	2.454	0.30(0.08)	0.25	24.0	45.00
14	63.12	12.23	2.432	0.30(0.08)	0.25	24.4	63.00
15	63.38	12.42	2.410	0.30(0.08)	0.25	24.8	30.00
16	63.64	12.66	2.384	0.30(0.08)	0.25	25.3	60.00
17	63.78	12.79	2.370	0.30(0.08)	0.25	25.6	38.00
18	63.81	12.82	2.366	0.30(0.08)	0.25	25.6	68.00
19	64.10	13.19	2.329	0.30(0.08)	0.25	26.3	30.00
20	64.17	13.30	2.317	0.30(0.08)	0.25	26.5	36.00
21	64.64	14.19	2.233	0.30(0.07)	0.25	27.9	14.00
22	64.75	14.37	2.217	0.30(0.07)	0.24	28.2	38.00
23	64.78	14.45	2.210	0.30(0.07)	0.24	28.4	26.00
24	64.78	14.46	2.209	0.30(0.07)	0.24	28.4	27.00
25	64.89	14.83	2.178	0.30(0.07)	0.24	29.0	72.00
26	64.93	15.19	2.148	0.30(0.07)	0.24	29.5	20.00
27	64.88	15.65	2.111	0.30(0.07)	0.24	30.1	23.00
28	64.87	15.67	2.110	0.30(0.07)	0.24	30.2	17.00
29	64.86	15.72	2.106	0.30(0.07)	0.24	30.2	29.00
30	64.61	16.42	2.054	0.30(0.07)	0.24	31.1	50.00
31	64.04	16.91	2.020	0.30(0.07)	0.24	31.4	34.00
32	63.96	16.97	2.015	0.30(0.07)	0.24	31.5	39.00
33	63.28	17.42	1.986	0.30(0.07)	0.24	31.7	24.00
34	58.61	20.80	1.794	0.30(0.07)	0.23	33.2	12.00
35	56.10	22.96	1.695	0.30(0.07)	0.23	34.1	64.00
36	54.75	24.17	1.646	0.30(0.07)	0.23	34.5	32.00
37	54.14	24.56	1.631	0.30(0.07)	0.23	34.5	10.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 64.93 Tc(MIN.) = 15.19
EFFECTIVE AREA(ACRES) = 29.49 AREA-AVERAGED Fm(INCH/HR) = 0.07
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.24
TOTAL AREA(ACRES) = 34.5
LONGEST FLOWPATH FROM NODE 10.00 TO NODE 74.00 = 2940.00 FEET.

****
FLOW PROCESS FROM NODE 80.00 TO NODE 81.00 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==
INITIAL SUBAREA FLOW-LENGTH(FEET) = 290.00
ELEVATION DATA: UPSTREAM(FEET) = 166.40 DOWNSTREAM(FEET) = 165.90

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.484
* 10 YEAR RAINFALL INTENSITY(INCH/HR) = 2.656
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	B	0.76	0.30	0.100	56	10.48

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA RUNOFF(CFS) = 1.80
TOTAL AREA(ACRES) = 0.76 PEAK FLOW RATE(CFS) = 1.80

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****************************************************************************
 FLOW PROCESS FROM NODE     81.00 TO NODE     82.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   153.00  DOWNSTREAM(FEET) =   147.60
 FLOW LENGTH(FEET) =   320.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   5.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.41
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.80
 PIPE TRAVEL TIME(MIN.) =   0.99    Tc(MIN.) =   11.47
 LONGEST FLOWPATH FROM NODE     80.00 TO NODE     82.00 =     610.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     82.00 TO NODE     82.00 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.) =   11.47
 RAINFALL INTENSITY(INCH/HR) =   2.52
 AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       0.76
 TOTAL STREAM AREA(ACRES) =       0.76
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.80

****************************************************************************
 FLOW PROCESS FROM NODE     81.00 TO NODE     82.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   320.00
 ELEVATION DATA: UPSTREAM(FEET) =    165.90  DOWNSTREAM(FEET) =    165.40

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.122
 *  10 YEAR RAINFALL INTENSITY(INCH/HR) =  2.568
 SUBAREA Tc 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        0.59      0.30      0.100    56   11.12
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =      1.35
 TOTAL AREA(ACRES) =      0.59   PEAK FLOW RATE(CFS) =      1.35

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

```
 FLOW PROCESS FROM NODE     82.00 TO NODE     82.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   11.12
 RAINFALL INTENSITY(INCH/HR) =   2.57
 AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       0.59
 TOTAL STREAM AREA(ACRES) =       0.59
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.35

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        1.80   11.47    2.523  0.30( 0.03) 0.10       0.8      80.00
     2        1.35   11.12    2.568  0.30( 0.03) 0.10       0.6      81.00

 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        3.12   11.12    2.568  0.30( 0.03) 0.10       1.3      81.00
     2        3.12   11.47    2.523  0.30( 0.03) 0.10       1.3      80.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       3.12    Tc(MIN.) =    11.12
 EFFECTIVE AREA(ACRES) =       1.33   AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =        1.3
 LONGEST FLOWPATH FROM NODE     80.00 TO NODE     82.00 =     610.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =        1.3  TC(MIN.) =     11.12
 EFFECTIVE AREA(ACRES) =      1.33  AREA-AVERAGED Fm(INCH/HR)=  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.100
 PEAK FLOW RATE(CFS)   =       3.12

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        3.12   11.12    2.568  0.30( 0.03) 0.10       1.3      81.00
     2        3.12   11.47    2.523  0.30( 0.03) 0.10       1.3      80.00
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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          Ver. 20.0  Release Date: 06/01/2013  License ID 1654

                        Analysis prepared by:

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 ************************** DESCRIPTION OF STUDY **************************
 * FREEMAN                                                                  *
 * PROPOSED CONDITION                                                       *
 * 25 YEAR ANALYSIS                                                         *
 **************************************************************************

  FILE NAME: FRPR25.DAT
  TIME/DATE OF STUDY: 19:01 05/28/2017
============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
============================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =   25.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) II ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   24.0     19.0    0.020/0.020/0.020   0.67    2.00 0.0312 0.167 0.0150
  2   18.0     13.0    0.020/0.020/0.020   0.50    1.50 0.0312 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.50 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
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     10.00 TO NODE     32.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   265.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.50  DOWNSTREAM(FEET) =    166.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.337
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.612
  SUBAREA Tc 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        0.15      0.30     0.100    56    8.34
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.48
  TOTAL AREA(ACRES) =      0.15   PEAK FLOW RATE(CFS) =      0.48

****************************************************************************
  FLOW PROCESS FROM NODE     32.00 TO NODE     11.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  166.30  DOWNSTREAM ELEVATION(FEET) =  165.10
  STREET LENGTH(FEET) =   210.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 25.00

  DISTANCE FROM CROWN 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) =       0.65
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.25
    HALFSTREET FLOOD WIDTH(FEET) =    6.01
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.36
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.33
  STREET FLOW TRAVEL TIME(MIN.) =   2.58   Tc(MIN.) =   10.92
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.100
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        0.12      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) =    0.12      SUBAREA RUNOFF(CFS) =    0.33
  EFFECTIVE AREA(ACRES) =      0.27    AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        0.3        PEAK FLOW RATE(CFS) =       0.75

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.26   HALFSTREET FLOOD WIDTH(FEET) =   6.48
  FLOW VELOCITY(FEET/SEC.) =  1.39   DEPTH*VELOCITY(FT*FT/SEC.) =   0.35
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     11.00 =     475.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     11.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.92
  RAINFALL INTENSITY(INCH/HR) =   3.10
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       0.27
  TOTAL STREAM AREA(ACRES) =       0.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.75

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE     11.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   210.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.00  DOWNSTREAM(FEET) =    165.10

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.680
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.783
  SUBAREA Tc 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        0.76      0.30     0.100    56    7.68
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      2.57
  TOTAL AREA(ACRES) =      0.76   PEAK FLOW RATE(CFS) =      2.57

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     11.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
```

```
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    7.68
 RAINFALL INTENSITY(INCH/HR) =   3.78
 AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       0.76
 TOTAL STREAM AREA(ACRES) =       0.76
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.57

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        0.75   10.92    3.100  0.30( 0.03) 0.10       0.3      10.00
     2        2.57    7.68    3.783  0.30( 0.03) 0.10       0.8      12.00

 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        3.21    7.68    3.783  0.30( 0.03) 0.10       0.9      12.00
     2        2.85   10.92    3.100  0.30( 0.03) 0.10       1.0      10.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       3.21    Tc(MIN.) =     7.68
 EFFECTIVE AREA(ACRES) =       0.95   AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =        1.0
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     11.00 =     475.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     11.00 TO NODE     13.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  165.10  DOWNSTREAM ELEVATION(FEET) =  164.20
 STREET LENGTH(FEET) =   455.00   CURB HEIGHT(INCHES) =  8.0
 STREET HALFWIDTH(FEET) = 24.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  19.00
 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) =       3.65
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.48
```

```
    HALFSTREET FLOOD WIDTH(FEET) =   15.95
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.34
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.64
  STREET FLOW TRAVEL TIME(MIN.) =   5.67   Tc(MIN.) =   13.35
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.767
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        0.36      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) =    0.36      SUBAREA RUNOFF(CFS) =    0.89
  EFFECTIVE AREA(ACRES) =      1.31    AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        1.4        PEAK FLOW RATE(CFS) =       3.23

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.46   HALFSTREET FLOOD WIDTH(FEET) =  15.21
  FLOW VELOCITY(FEET/SEC.) =  1.29   DEPTH*VELOCITY(FT*FT/SEC.) =   0.60
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     13.00 =     930.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.35
  RAINFALL INTENSITY(INCH/HR) =   2.77
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       1.31
  TOTAL STREAM AREA(ACRES) =       1.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       3.23

****************************************************************************
  FLOW PROCESS FROM NODE     14.00 TO NODE     15.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   125.00
  ELEVATION DATA: UPSTREAM(FEET) =    164.60  DOWNSTREAM(FEET) =    164.20

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.616
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  4.117
  SUBAREA Tc 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        0.15      0.30     0.100    56    6.62
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
```

```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      0.55
  TOTAL AREA(ACRES) =      0.15   PEAK FLOW RATE(CFS) =      0.55

****************************************************************************
  FLOW PROCESS FROM NODE     15.00 TO NODE     13.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   159.30  DOWNSTREAM(FEET) =   159.20
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.76
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.55
  PIPE TRAVEL TIME(MIN.) =   0.47    Tc(MIN.) =    7.09
  LONGEST FLOWPATH FROM NODE     14.00 TO NODE     13.00 =     175.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.09
  RAINFALL INTENSITY(INCH/HR) =   3.96
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       0.15
  TOTAL STREAM AREA(ACRES) =       0.15
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.55

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        3.23   13.35    2.767  0.30( 0.03) 0.10       1.3      12.00
      1        3.00   16.78    2.431  0.30( 0.03) 0.10       1.4      10.00
      2        0.55    7.09    3.959  0.30( 0.03) 0.10       0.2      14.00

  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        3.01    7.09    3.959  0.30( 0.03) 0.10       0.8      14.00
      2        3.61   13.35    2.767  0.30( 0.03) 0.10       1.5      12.00
      3        3.34   16.78    2.431  0.30( 0.03) 0.10       1.5      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
```

```
  PEAK FLOW RATE(CFS) =       3.61    Tc(MIN.) =    13.35
  EFFECTIVE AREA(ACRES) =       1.46   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        1.5
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     13.00 =     930.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     16.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   159.20  DOWNSTREAM(FEET) =   151.55
  FLOW LENGTH(FEET) =   235.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   5.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.11
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.61
  PIPE TRAVEL TIME(MIN.) =   0.48    Tc(MIN.) =   13.84
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     16.00 =    1165.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     17.00 TO NODE     18.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   150.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.90  DOWNSTREAM(FEET) =    166.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.741
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.516
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.36      0.30      0.350    56    8.74
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.11
  TOTAL AREA(ACRES) =      0.36   PEAK FLOW RATE(CFS) =      1.11

****************************************************************************
  FLOW PROCESS FROM NODE     18.00 TO NODE     19.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
 ELEVATION DATA: UPSTREAM(FEET) =   153.00  DOWNSTREAM(FEET) =   151.60
 FLOW LENGTH(FEET) =    65.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   3.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.19
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.11
 PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =    8.95
 LONGEST FLOWPATH FROM NODE     17.00 TO NODE     19.00 =     215.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     19.00 TO NODE     19.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =    8.95
 RAINFALL INTENSITY(INCH/HR) =   3.47
 AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.35
 EFFECTIVE STREAM AREA(ACRES) =       0.36
 TOTAL STREAM AREA(ACRES) =       0.36
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.11

****************************************************************************
 FLOW PROCESS FROM NODE     20.00 TO NODE     21.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   150.00
 ELEVATION DATA: UPSTREAM(FEET) =    167.30  DOWNSTREAM(FEET) =    166.80

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.359
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.606
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 CONDOMINIUMS               A        0.50      0.40     0.350    32    8.36
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
 SUBAREA RUNOFF(CFS) =      1.56
 TOTAL AREA(ACRES) =      0.50   PEAK FLOW RATE(CFS) =      1.56

****************************************************************************
 FLOW PROCESS FROM NODE     21.00 TO NODE     19.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   153.00  DOWNSTREAM(FEET) =   151.60
```

```
  FLOW LENGTH(FEET) =    45.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   4.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.52
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.56
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =    8.47
  LONGEST FLOWPATH FROM NODE     20.00 TO NODE     19.00 =     195.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     19.00 TO NODE     19.00 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.) =    8.47
  RAINFALL INTENSITY(INCH/HR) =   3.58
  AREA-AVERAGED Fm(INCH/HR) =  0.14
  AREA-AVERAGED Fp(INCH/HR) =  0.40
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.50
  TOTAL STREAM AREA(ACRES) =       0.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.56

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        1.11    8.95    3.470  0.30( 0.11) 0.35       0.4      17.00
      2        1.56    8.47    3.578  0.40( 0.14) 0.35       0.5      20.00

  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        2.64    8.47    3.578  0.36( 0.13) 0.35       0.8      20.00
      2        2.62    8.95    3.470  0.36( 0.13) 0.35       0.9      17.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       2.64    Tc(MIN.) =     8.47
  EFFECTIVE AREA(ACRES) =       0.84   AREA-AVERAGED Fm(INCH/HR) =  0.13
  AREA-AVERAGED Fp(INCH/HR) =  0.36  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        0.9
  LONGEST FLOWPATH FROM NODE     17.00 TO NODE     19.00 =     215.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     19.00 TO NODE     19.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    8.47
```

```
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.578
 SUBAREA LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 CONDOMINIUMS               B        0.42      0.30     0.350    56
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
 SUBAREA AREA(ACRES) =    0.42      SUBAREA RUNOFF(CFS) =    1.31
 EFFECTIVE AREA(ACRES) =      1.26   AREA-AVERAGED Fm(INCH/HR) =  0.12
 AREA-AVERAGED Fp(INCH/HR) =  0.34  AREA-AVERAGED Ap =  0.35
 TOTAL AREA(ACRES) =        1.3       PEAK FLOW RATE(CFS) =       3.93

****************************************************************************
 FLOW PROCESS FROM NODE     19.00 TO NODE     16.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   151.60  DOWNSTREAM(FEET) =   151.55
 FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   2.69
 GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       3.93
 PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =    8.66
 LONGEST FLOWPATH FROM NODE     17.00 TO NODE     16.00 =     245.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 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        3.93    8.66    3.535  0.34( 0.12) 0.35       1.3      20.00
     2        3.86    9.14    3.429  0.34( 0.12) 0.35       1.3      17.00
 LONGEST FLOWPATH FROM NODE     17.00 TO NODE     16.00 =     245.00 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        3.01    7.60    3.806  0.30( 0.03) 0.10       0.8      14.00
     2        3.61   13.84    2.711  0.30( 0.03) 0.10       1.5      12.00
     3        3.34   17.28    2.391  0.30( 0.03) 0.10       1.5      10.00
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     16.00 =    1165.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        6.73    7.60    3.806  0.33( 0.08) 0.24       2.0      14.00
     2        7.04    8.66    3.535  0.33( 0.08) 0.24       2.2      20.00
     3        7.02    9.14    3.429  0.33( 0.08) 0.24       2.3      17.00
```

```
      4        6.63   13.84    2.711  0.33( 0.07) 0.22       2.7      12.00
      5        5.99   17.28    2.391  0.33( 0.07) 0.21       2.8      10.00
    TOTAL AREA(ACRES) =          2.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =        7.04  Tc(MIN.) =    8.660
  EFFECTIVE AREA(ACRES) =      2.21  AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.33  AREA-AVERAGED Ap =  0.24
  TOTAL AREA(ACRES) =        2.8
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     16.00 =    1165.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     22.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   151.55  DOWNSTREAM(FEET) =   151.30
  FLOW LENGTH(FEET) =   115.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  16.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.41
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.04
  PIPE TRAVEL TIME(MIN.) =   0.56    Tc(MIN.) =    9.22
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     22.00 =    1280.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     22.00 TO NODE     22.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    9.22
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.411
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  CONDOMINIUMS               A        0.31      0.40     0.350    32
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA AREA(ACRES) =    0.31      SUBAREA RUNOFF(CFS) =    0.91
  EFFECTIVE AREA(ACRES) =      2.52   AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.34  AREA-AVERAGED Ap =  0.26
  TOTAL AREA(ACRES) =        3.1       PEAK FLOW RATE(CFS) =       7.54

****************************************************************************
  FLOW PROCESS FROM NODE     22.00 TO NODE     22.00 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.) =    9.22
  RAINFALL INTENSITY(INCH/HR) =   3.41
  AREA-AVERAGED Fm(INCH/HR) =  0.09
```

```
 AREA-AVERAGED Fp(INCH/HR) =  0.34
 AREA-AVERAGED Ap =  0.26
 EFFECTIVE STREAM AREA(ACRES) =       2.52
 TOTAL STREAM AREA(ACRES) =       3.13
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       7.54

****************************************************************************
 FLOW PROCESS FROM NODE     23.00 TO NODE     22.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   225.00
 ELEVATION DATA: UPSTREAM(FEET) =    166.30  DOWNSTREAM(FEET) =    165.50

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.705
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.314
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 CONDOMINIUMS               B        0.71      0.30     0.350    56    9.70
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
 SUBAREA RUNOFF(CFS) =      2.05
 TOTAL AREA(ACRES) =      0.71   PEAK FLOW RATE(CFS) =      2.05

****************************************************************************
 FLOW PROCESS FROM NODE     22.00 TO NODE     22.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.70
 RAINFALL INTENSITY(INCH/HR) =   3.31
 AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.35
 EFFECTIVE STREAM AREA(ACRES) =       0.71
 TOTAL STREAM AREA(ACRES) =       0.71
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.05

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        7.26    8.16    3.655  0.35( 0.09) 0.26       2.3      14.00
     1        7.54    9.22    3.411  0.34( 0.09) 0.26       2.5      20.00
     1        7.52    9.70    3.315  0.34( 0.09) 0.25       2.6      17.00
     1        7.06   14.40    2.651  0.34( 0.08) 0.23       3.0      12.00
     1        6.40   17.85    2.347  0.34( 0.08) 0.23       3.1      10.00
     2        2.05    9.70    3.314  0.30( 0.11) 0.35       0.7      23.00
```

```
  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        9.17    8.16    3.655  0.33( 0.09) 0.28       2.9      14.00
      2        9.55    9.22    3.411  0.33( 0.09) 0.28       3.2      20.00
      3        9.57    9.70    3.315  0.33( 0.09) 0.27       3.3      17.00
      4        9.57    9.70    3.314  0.33( 0.09) 0.27       3.3      23.00
      5        8.69   14.40    2.651  0.33( 0.08) 0.25       3.8      12.00
      6        7.83   17.85    2.347  0.33( 0.08) 0.25       3.8      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       9.57    Tc(MIN.) =     9.70
  EFFECTIVE AREA(ACRES) =       3.30   AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.33  AREA-AVERAGED Ap =  0.27
  TOTAL AREA(ACRES) =        3.8
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     22.00 =    1280.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     22.00 TO NODE     22.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     24.00 TO NODE     25.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   270.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.354
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.195
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.51      0.30     0.350    56   10.35
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.42
  TOTAL AREA(ACRES) =      0.51   PEAK FLOW RATE(CFS) =      1.42

****************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE     25.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
```

```
  TIME OF CONCENTRATION(MIN.) =   10.35
  RAINFALL INTENSITY(INCH/HR) =   3.19
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.51
  TOTAL STREAM AREA(ACRES) =       0.51
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.42

****************************************************************************
  FLOW PROCESS FROM NODE     26.00 TO NODE     25.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   155.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.422
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.857
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.30      0.30     0.350    56    7.42
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.01
  TOTAL AREA(ACRES) =      0.30   PEAK FLOW RATE(CFS) =      1.01

****************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE     25.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.42
  RAINFALL INTENSITY(INCH/HR) =   3.86
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.30
  TOTAL STREAM AREA(ACRES) =       0.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.01

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        1.42   10.35    3.195  0.30( 0.11) 0.35       0.5      24.00
      2        1.01    7.42    3.857  0.30( 0.10) 0.35       0.3      26.00

  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        2.25    7.42    3.857  0.30( 0.10) 0.35       0.7      26.00
      2        2.25   10.35    3.195  0.30( 0.11) 0.35       0.8      24.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       2.25    Tc(MIN.) =    10.35
  EFFECTIVE AREA(ACRES) =       0.81   AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        0.8
  LONGEST FLOWPATH FROM NODE     24.00 TO NODE     25.00 =     270.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE     28.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   161.00  DOWNSTREAM(FEET) =   158.00
  FLOW LENGTH(FEET) =   175.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.77
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.25
  PIPE TRAVEL TIME(MIN.) =   0.51    Tc(MIN.) =   10.86
  LONGEST FLOWPATH FROM NODE     24.00 TO NODE     28.00 =     445.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     28.00 TO NODE     28.00 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.) =   10.86
  RAINFALL INTENSITY(INCH/HR) =   3.11
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.81
  TOTAL STREAM AREA(ACRES) =       0.81
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.25

****************************************************************************
  FLOW PROCESS FROM NODE     27.00 TO NODE     28.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   180.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.40
```

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.965
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.706
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.18      0.30     0.350    56    7.97
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.58
  TOTAL AREA(ACRES) =      0.18   PEAK FLOW RATE(CFS) =      0.58

****************************************************************************
  FLOW PROCESS FROM NODE     28.00 TO NODE     28.00 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.) =    7.97
  RAINFALL INTENSITY(INCH/HR) =   3.71
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.18
  TOTAL STREAM AREA(ACRES) =       0.18
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.58

****************************************************************************
  FLOW PROCESS FROM NODE     29.00 TO NODE     28.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   230.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.227
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.410
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.48      0.30     0.350    56    9.23
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.43
  TOTAL AREA(ACRES) =      0.48   PEAK FLOW RATE(CFS) =      1.43

****************************************************************************
  FLOW PROCESS FROM NODE     28.00 TO NODE     28.00 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.) =    9.23
  RAINFALL INTENSITY(INCH/HR) =   3.41
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.48
  TOTAL STREAM AREA(ACRES) =       0.48
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.43

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        2.25    7.93    3.716  0.30( 0.10) 0.35       0.7      26.00
      1        2.25   10.86    3.110  0.30( 0.11) 0.35       0.8      24.00
      2        0.58    7.97    3.706  0.30( 0.11) 0.35       0.2      27.00
      3        1.43    9.23    3.410  0.30( 0.11) 0.35       0.5      29.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        4.17    7.93    3.716  0.30( 0.10) 0.35       1.3      26.00
      2        4.17    7.97    3.706  0.30( 0.11) 0.35       1.3      27.00
      3        4.22    9.23    3.410  0.30( 0.11) 0.35       1.4      29.00
      4        4.04   10.86    3.110  0.30( 0.11) 0.35       1.5      24.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       4.22    Tc(MIN.) =     9.23
  EFFECTIVE AREA(ACRES) =       1.39   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        1.5
  LONGEST FLOWPATH FROM NODE     24.00 TO NODE     28.00 =     445.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     28.00 TO NODE     22.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   158.00  DOWNSTREAM(FEET) =   151.30
  FLOW LENGTH(FEET) =   250.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.93
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.22
  PIPE TRAVEL TIME(MIN.) =   0.53    Tc(MIN.) =    9.75
  LONGEST FLOWPATH FROM NODE     24.00 TO NODE     22.00 =     695.00 FEET.
```

```
****************************************************************************
 FLOW PROCESS FROM NODE     22.00 TO NODE     22.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        4.17    8.45    3.584  0.30( 0.10) 0.35       1.3      26.00
     2        4.17    8.49    3.574  0.30( 0.11) 0.35       1.3      27.00
     3        4.22    9.75    3.305  0.30( 0.11) 0.35       1.4      29.00
     4        4.04   11.39    3.027  0.30( 0.11) 0.35       1.5      24.00
 LONGEST FLOWPATH FROM NODE     24.00 TO NODE     22.00 =     695.00 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        9.17    8.16    3.655  0.33( 0.09) 0.28       2.9      14.00
     2        9.55    9.22    3.411  0.33( 0.09) 0.28       3.2      20.00
     3        9.57    9.70    3.315  0.33( 0.09) 0.27       3.3      17.00
     4        9.57    9.70    3.314  0.33( 0.09) 0.27       3.3      23.00
     5        8.69   14.40    2.651  0.33( 0.08) 0.25       3.8      12.00
     6        7.83   17.85    2.347  0.33( 0.08) 0.25       3.8      10.00
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     22.00 =    1280.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       13.28    8.16    3.655  0.32( 0.10) 0.30       4.1      14.00
     2       13.44    8.45    3.584  0.32( 0.10) 0.30       4.2      26.00
     3       13.46    8.49    3.574  0.32( 0.10) 0.30       4.2      27.00
     4       13.75    9.22    3.411  0.32( 0.10) 0.30       4.5      20.00
     5       13.78    9.70    3.315  0.32( 0.10) 0.30       4.7      17.00
     6       13.78    9.70    3.314  0.32( 0.10) 0.30       4.7      23.00
     7       13.78    9.75    3.305  0.32( 0.10) 0.30       4.7      29.00
     8       13.29   11.39    3.027  0.32( 0.09) 0.29       4.9      24.00
     9       12.21   14.40    2.651  0.32( 0.09) 0.28       5.2      12.00
    10       10.93   17.85    2.347  0.32( 0.09) 0.28       5.3      10.00
   TOTAL AREA(ACRES) =         5.3

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       13.78  Tc(MIN.) =    9.705
 EFFECTIVE AREA(ACRES) =      4.68  AREA-AVERAGED Fm(INCH/HR) =  0.10
 AREA-AVERAGED Fp(INCH/HR) =  0.32  AREA-AVERAGED Ap =  0.29
 TOTAL AREA(ACRES) =        5.3
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     22.00 =    1280.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     22.00 TO NODE     33.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   151.30  DOWNSTREAM(FEET) =   150.50
  FLOW LENGTH(FEET) =   425.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  20.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.92
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      13.78
  PIPE TRAVEL TIME(MIN.) =   1.81    Tc(MIN.) =   11.51
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     33.00 =    1705.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE     31.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   150.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.277
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.901
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.29      0.30     0.350    56    7.28
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.99
  TOTAL AREA(ACRES) =      0.29   PEAK FLOW RATE(CFS) =      0.99

****************************************************************************
  FLOW PROCESS FROM NODE     31.00 TO NODE     31.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    7.28
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.901
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  CONDOMINIUMS               B        0.65      0.30     0.350    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA AREA(ACRES) =    0.65      SUBAREA RUNOFF(CFS) =    2.22
  EFFECTIVE AREA(ACRES) =      0.94   AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        0.9       PEAK FLOW RATE(CFS) =       3.21
```

```
****************************************************************************
 FLOW PROCESS FROM NODE     31.00 TO NODE     33.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   157.00  DOWNSTREAM(FEET) =   150.50
 FLOW LENGTH(FEET) =   380.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.28
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       3.21
 PIPE TRAVEL TIME(MIN.) =   1.01    Tc(MIN.) =    8.29
 LONGEST FLOWPATH FROM NODE     30.00 TO NODE     33.00 =     530.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 3 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        3.21    8.29    3.624  0.30( 0.11) 0.35       0.9      30.00
 LONGEST FLOWPATH FROM NODE     30.00 TO NODE     33.00 =     530.00 FEET.

 ** MEMORY BANK #  3 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       13.28    9.98    3.262  0.32( 0.10) 0.30       4.1      14.00
     2       13.44   10.27    3.210  0.32( 0.10) 0.30       4.2      26.00
     3       13.46   10.31    3.203  0.32( 0.10) 0.30       4.2      27.00
     4       13.75   11.03    3.083  0.32( 0.10) 0.30       4.5      20.00
     5       13.78   11.50    3.010  0.32( 0.10) 0.30       4.7      17.00
     6       13.78   11.51    3.009  0.32( 0.10) 0.30       4.7      23.00
     7       13.78   11.56    3.002  0.32( 0.10) 0.30       4.7      29.00
     8       13.29   13.21    2.784  0.32( 0.09) 0.29       4.9      24.00
     9       12.21   16.29    2.472  0.32( 0.09) 0.28       5.2      12.00
    10       10.93   19.77    2.215  0.32( 0.09) 0.28       5.3      10.00
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     33.00 =    1705.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       15.50    8.29    3.624  0.32( 0.10) 0.31       4.3      30.00
     2       16.16    9.98    3.262  0.32( 0.10) 0.31       5.0      14.00
     3       16.28   10.27    3.210  0.32( 0.10) 0.31       5.1      26.00
     4       16.29   10.31    3.203  0.32( 0.10) 0.31       5.2      27.00
     5       16.46   11.03    3.083  0.32( 0.10) 0.31       5.5      20.00
     6       16.43   11.50    3.010  0.32( 0.10) 0.31       5.6      17.00
     7       16.43   11.51    3.009  0.32( 0.10) 0.31       5.6      23.00
     8       16.42   11.56    3.002  0.32( 0.10) 0.31       5.6      29.00
     9       15.73   13.21    2.784  0.32( 0.10) 0.30       5.9      24.00
```

```
     10       14.36   16.29    2.472  0.32( 0.09) 0.29       6.2      12.00
     11       12.85   19.77    2.215  0.32( 0.09) 0.29       6.2      10.00
    TOTAL AREA(ACRES) =         6.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       16.46  Tc(MIN.) =   11.030
  EFFECTIVE AREA(ACRES) =      5.47  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.32  AREA-AVERAGED Ap =  0.31
  TOTAL AREA(ACRES) =        6.2
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     33.00 =    1705.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     22.00 TO NODE     22.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  5
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.03
  RAINFALL INTENSITY(INCH/HR) =   3.08
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.32
  AREA-AVERAGED Ap =  0.31
  EFFECTIVE STREAM AREA(ACRES) =       5.47
  TOTAL STREAM AREA(ACRES) =       6.25
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      16.46

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE     33.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   185.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.60  DOWNSTREAM(FEET) =    166.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.141
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.428
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
```

```
  CONDOMINIUMS                B        0.67      0.30     0.350    56    9.14
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      2.00
  TOTAL AREA(ACRES) =      0.67   PEAK FLOW RATE(CFS) =      2.00

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  5
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.14
  RAINFALL INTENSITY(INCH/HR) =   3.43
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.67
  TOTAL STREAM AREA(ACRES) =       0.67
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.00

****************************************************************************
  FLOW PROCESS FROM NODE     34.00 TO NODE     35.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   180.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.20  DOWNSTREAM(FEET) =    166.10

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.867
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.825
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS                B        0.50      0.30     0.350    56   12.87
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.22
  TOTAL AREA(ACRES) =      0.50   PEAK FLOW RATE(CFS) =      1.22

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  5
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.87
  RAINFALL INTENSITY(INCH/HR) =   2.83
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
```

```
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.50
  TOTAL STREAM AREA(ACRES) =       0.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.22

****************************************************************************
  FLOW PROCESS FROM NODE     36.00 TO NODE     37.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   150.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.70  DOWNSTREAM(FEET) =    166.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.258
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.404
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.29      0.30     0.350    56    9.26
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.86
  TOTAL AREA(ACRES) =      0.29   PEAK FLOW RATE(CFS) =      0.86

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  5
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  4 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.26
  RAINFALL INTENSITY(INCH/HR) =   3.40
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.29
  TOTAL STREAM AREA(ACRES) =       0.29
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.86

****************************************************************************
  FLOW PROCESS FROM NODE     38.00 TO NODE     33.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   150.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.40  DOWNSTREAM(FEET) =    166.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.741
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.516
```

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.)
CONDOMINIUMS	B	0.18	0.30	0.350	56	8.74

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350
SUBAREA RUNOFF(CFS) = 0.55
TOTAL AREA(ACRES) = 0.18 PEAK FLOW RATE(CFS) = 0.55

****
FLOW PROCESS FROM NODE 33.00 TO NODE 33.00 IS CODE = 1

>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==========
TOTAL NUMBER OF STREAMS = 5
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 5 ARE:
TIME OF CONCENTRATION(MIN.) = 8.74
RAINFALL INTENSITY(INCH/HR) = 3.52
AREA-AVERAGED Fm(INCH/HR) = 0.11
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.35
EFFECTIVE STREAM AREA(ACRES) = 0.18
TOTAL STREAM AREA(ACRES) = 0.18
PEAK FLOW RATE(CFS) AT CONFLUENCE = 0.55

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	15.50	8.29	3.624	0.32(0.10)	0.31	4.3	30.00
1	16.16	9.98	3.262	0.32(0.10)	0.31	5.0	14.00
1	16.28	10.27	3.210	0.32(0.10)	0.31	5.1	26.00
1	16.29	10.31	3.203	0.32(0.10)	0.31	5.2	27.00
1	16.46	11.03	3.083	0.32(0.10)	0.31	5.5	20.00
1	16.43	11.50	3.010	0.32(0.10)	0.31	5.6	17.00
1	16.43	11.51	3.009	0.32(0.10)	0.31	5.6	23.00
1	16.42	11.56	3.002	0.32(0.10)	0.31	5.6	29.00
1	15.73	13.21	2.784	0.32(0.10)	0.30	5.9	24.00
1	14.36	16.29	2.472	0.32(0.09)	0.29	6.2	12.00
1	12.85	19.77	2.215	0.32(0.09)	0.29	6.2	10.00
2	2.00	9.14	3.428	0.30(0.11)	0.35	0.7	30.00
3	1.22	12.87	2.825	0.30(0.11)	0.35	0.5	34.00
4	0.86	9.26	3.404	0.30(0.11)	0.35	0.3	36.00
5	0.55	8.74	3.516	0.30(0.11)	0.35	0.2	38.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 5 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	19.80	8.29	3.624	0.31(0.10)	0.32	5.7	30.00
2	20.08	8.74	3.516	0.31(0.10)	0.32	5.9	38.00
3	20.29	9.14	3.428	0.31(0.10)	0.32	6.2	30.00

```
      4       20.33    9.26    3.404  0.31( 0.10) 0.32       6.2      36.00
      5       20.50    9.98    3.262  0.31( 0.10) 0.32       6.5      14.00
      6       20.58   10.27    3.210  0.31( 0.10) 0.32       6.7      26.00
      7       20.58   10.31    3.203  0.31( 0.10) 0.32       6.7      27.00
      8       20.67   11.03    3.083  0.31( 0.10) 0.32       7.0      20.00
      9       20.58   11.50    3.010  0.31( 0.10) 0.32       7.2      17.00
     10       20.58   11.51    3.009  0.31( 0.10) 0.32       7.2      23.00
     11       20.56   11.56    3.002  0.31( 0.10) 0.32       7.2      29.00
     12       19.89   12.87    2.825  0.31( 0.10) 0.31       7.5      34.00
     13       19.69   13.21    2.784  0.31( 0.10) 0.31       7.5      24.00
     14       17.86   16.29    2.472  0.31( 0.09) 0.30       7.8      12.00
     15       15.97   19.77    2.215  0.31( 0.09) 0.30       7.9      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      20.67    Tc(MIN.) =    11.03
  EFFECTIVE AREA(ACRES) =       7.04   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.31  AREA-AVERAGED Ap =  0.32
  TOTAL AREA(ACRES) =        7.9
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     33.00 =    1705.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     38.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   150.50  DOWNSTREAM(FEET) =   150.20
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  24.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.39
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      20.67
  PIPE TRAVEL TIME(MIN.) =   0.57    Tc(MIN.) =   11.60
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     38.00 =    1855.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     38.00 TO NODE     38.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     39.00 TO NODE     40.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  ELEVATION DATA: UPSTREAM(FEET) =    168.00  DOWNSTREAM(FEET) =    166.90

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.822
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.116
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
```

```
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.80      0.30      0.350    56   10.82
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      2.17
  TOTAL AREA(ACRES) =      0.80   PEAK FLOW RATE(CFS) =      2.17

****************************************************************************
  FLOW PROCESS FROM NODE     40.00 TO NODE     41.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   154.00  DOWNSTREAM(FEET) =   151.10
  FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   3.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.69
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.17
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =   10.89
  LONGEST FLOWPATH FROM NODE     39.00 TO NODE     41.00 =     340.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     41.00 TO NODE     41.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   10.89
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.105
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  CONDOMINIUMS               B        0.45      0.30      0.350    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA AREA(ACRES) =    0.45      SUBAREA RUNOFF(CFS) =    1.21
  EFFECTIVE AREA(ACRES) =      1.25   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        1.2       PEAK FLOW RATE(CFS) =       3.37

****************************************************************************
  FLOW PROCESS FROM NODE     41.00 TO NODE     42.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   151.10  DOWNSTREAM(FEET) =   150.60
  FLOW LENGTH(FEET) =   270.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.75
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.37
```

```
  PIPE TRAVEL TIME(MIN.) =   1.64    Tc(MIN.) =   12.53
  LONGEST FLOWPATH FROM NODE     39.00 TO NODE     42.00 =     610.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     42.00 TO NODE     42.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   12.53
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.868
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  CONDOMINIUMS               B        1.15      0.30     0.350    56
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA AREA(ACRES) =    1.15      SUBAREA RUNOFF(CFS) =    2.86
  EFFECTIVE AREA(ACRES) =      2.40   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        2.4       PEAK FLOW RATE(CFS) =       5.97

****************************************************************************
  FLOW PROCESS FROM NODE     42.00 TO NODE     42.00 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.) =   12.53
  RAINFALL INTENSITY(INCH/HR) =   2.87
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       2.40
  TOTAL STREAM AREA(ACRES) =       2.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       5.97

****************************************************************************
  FLOW PROCESS FROM NODE     43.00 TO NODE     44.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   180.00
  ELEVATION DATA: UPSTREAM(FEET) =    168.00  DOWNSTREAM(FEET) =    166.20

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.218
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.919
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.44      0.30     0.350    56    7.22
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
```

```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.51
  TOTAL AREA(ACRES) =      0.44   PEAK FLOW RATE(CFS) =      1.51

****************************************************************************
  FLOW PROCESS FROM NODE     44.00 TO NODE     42.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   153.00  DOWNSTREAM(FEET) =   150.60
  FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   4.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.52
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.51
  PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =    7.41
  LONGEST FLOWPATH FROM NODE     43.00 TO NODE     42.00 =     255.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     42.00 TO NODE     42.00 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.) =    7.41
  RAINFALL INTENSITY(INCH/HR) =   3.86
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.44
  TOTAL STREAM AREA(ACRES) =       0.44
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.51

****************************************************************************
  FLOW PROCESS FROM NODE     45.00 TO NODE     46.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   180.00
  ELEVATION DATA: UPSTREAM(FEET) =    168.00  DOWNSTREAM(FEET) =    166.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.390
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.867
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.45      0.30     0.350    56    7.39
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
```

```
  SUBAREA RUNOFF(CFS) =      1.52
  TOTAL AREA(ACRES) =      0.45   PEAK FLOW RATE(CFS) =      1.52

****************************************************************************
  FLOW PROCESS FROM NODE     46.00 TO NODE     42.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   153.00  DOWNSTREAM(FEET) =   150.60
  FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   4.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.55
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.52
  PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =    7.58
  LONGEST FLOWPATH FROM NODE     45.00 TO NODE     42.00 =     255.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     42.00 TO NODE     42.00 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.) =    7.58
  RAINFALL INTENSITY(INCH/HR) =   3.81
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.45
  TOTAL STREAM AREA(ACRES) =       0.45
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.52

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        5.97   12.53    2.868  0.30( 0.10) 0.35       2.4      39.00
      2        1.51    7.41    3.861  0.30( 0.11) 0.35       0.4      43.00
      3        1.52    7.58    3.811  0.30( 0.10) 0.35       0.4      45.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        7.82    7.41    3.861  0.30( 0.10) 0.35       2.3      43.00
      2        7.86    7.58    3.811  0.30( 0.10) 0.35       2.3      45.00
      3        8.21   12.53    2.868  0.30( 0.10) 0.35       3.3      39.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
```

```
  PEAK FLOW RATE(CFS) =       8.21    Tc(MIN.) =    12.53
  EFFECTIVE AREA(ACRES) =       3.29   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        3.3
  LONGEST FLOWPATH FROM NODE     39.00 TO NODE     42.00 =     610.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     42.00 TO NODE     38.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   150.60  DOWNSTREAM(FEET) =   150.20
  FLOW LENGTH(FEET) =   190.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.59
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.21
  PIPE TRAVEL TIME(MIN.) =   0.88    Tc(MIN.) =   13.41
  LONGEST FLOWPATH FROM NODE     39.00 TO NODE     38.00 =     800.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     38.00 TO NODE     38.00 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        7.82    8.30    3.621  0.30( 0.10) 0.35       2.3      43.00
      2        7.86    8.47    3.579  0.30( 0.10) 0.35       2.3      45.00
      3        8.21   13.41    2.759  0.30( 0.10) 0.35       3.3      39.00
  LONGEST FLOWPATH FROM NODE     39.00 TO NODE     38.00 =     800.00 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       19.80    8.86    3.490  0.31( 0.10) 0.32       5.7      30.00
      2       20.08    9.31    3.392  0.31( 0.10) 0.32       5.9      38.00
      3       20.29    9.71    3.313  0.31( 0.10) 0.32       6.2      30.00
      4       20.33    9.83    3.290  0.31( 0.10) 0.32       6.2      36.00
      5       20.50   10.55    3.161  0.31( 0.10) 0.32       6.5      14.00
      6       20.58   10.84    3.113  0.31( 0.10) 0.32       6.7      26.00
      7       20.58   10.88    3.107  0.31( 0.10) 0.32       6.7      27.00
      8       20.67   11.60    2.996  0.31( 0.10) 0.32       7.0      20.00
      9       20.58   12.07    2.929  0.31( 0.10) 0.32       7.2      17.00
     10       20.58   12.08    2.928  0.31( 0.10) 0.32       7.2      23.00
     11       20.56   12.13    2.921  0.31( 0.10) 0.32       7.2      29.00
     12       19.89   13.44    2.756  0.31( 0.10) 0.31       7.5      34.00
     13       19.69   13.78    2.717  0.31( 0.10) 0.31       7.5      24.00
     14       17.86   16.89    2.422  0.31( 0.09) 0.30       7.8      12.00
     15       15.97   20.38    2.178  0.31( 0.09) 0.30       7.9      10.00
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     38.00 =    1855.00 FEET.
```

```
 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)     NODE
     1       27.09    8.30    3.621  0.31( 0.10) 0.33        7.6      43.00
     2       27.29    8.47    3.579  0.31( 0.10) 0.33        7.8      45.00
     3       27.69    8.86    3.490  0.31( 0.10) 0.33        8.1      30.00
     4       27.99    9.31    3.392  0.31( 0.10) 0.33        8.4      38.00
     5       28.24    9.71    3.313  0.31( 0.10) 0.33        8.7      30.00
     6       28.28    9.83    3.290  0.31( 0.10) 0.33        8.8      36.00
     7       28.51   10.55    3.161  0.31( 0.10) 0.33        9.3      14.00
     8       28.61   10.84    3.113  0.31( 0.10) 0.33        9.5      26.00
     9       28.61   10.88    3.107  0.31( 0.10) 0.33        9.5      27.00
    10       28.75   11.60    2.996  0.31( 0.10) 0.33       10.0      20.00
    11       28.70   12.07    2.929  0.31( 0.10) 0.33       10.2      17.00
    12       28.70   12.08    2.928  0.31( 0.10) 0.33       10.2      23.00
    13       28.68   12.13    2.921  0.31( 0.10) 0.33       10.3      29.00
    14       28.12   13.41    2.759  0.31( 0.10) 0.32       10.7      39.00
    15       28.10   13.44    2.756  0.31( 0.10) 0.32       10.8      34.00
    16       27.77   13.78    2.717  0.31( 0.10) 0.32       10.8      24.00
    17       25.03   16.89    2.422  0.31( 0.10) 0.32       11.1      12.00
    18       22.38   20.38    2.178  0.31( 0.10) 0.32       11.2      10.00
  TOTAL AREA(ACRES) =        11.2

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       28.75  Tc(MIN.) =   11.599
 EFFECTIVE AREA(ACRES) =      9.98  AREA-AVERAGED Fm(INCH/HR) =  0.10
 AREA-AVERAGED Fp(INCH/HR) =  0.31  AREA-AVERAGED Ap =  0.33
 TOTAL AREA(ACRES) =       11.2
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     38.00 =    1855.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     38.00 TO NODE     38.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE     38.00 TO NODE     47.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   150.20  DOWNSTREAM(FEET) =   149.90
 FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  36.0 INCH PIPE IS  29.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.69
 ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      28.75
 PIPE TRAVEL TIME(MIN.) =   0.53    Tc(MIN.) =   12.13
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     47.00 =    2005.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     47.00 TO NODE     47.00 IS CODE =  10
```

```
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     32.00 TO NODE     48.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.30  DOWNSTREAM(FEET) =    166.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.850
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.960
  SUBAREA Tc 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        2.62      0.30     0.100    56   11.85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      6.91
  TOTAL AREA(ACRES) =      2.62   PEAK FLOW RATE(CFS) =      6.91

****************************************************************************
  FLOW PROCESS FROM NODE     48.00 TO NODE     49.00 IS CODE =  61
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  166.00  DOWNSTREAM ELEVATION(FEET) =  165.60
  STREET LENGTH(FEET) =   485.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 25.00

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

  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) =      11.77
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.59
    HALFSTREET FLOOD WIDTH(FEET) =   27.48
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.04
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.61
  STREET FLOW TRAVEL TIME(MIN.) =   7.75   Tc(MIN.) =   19.60
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.226
  SUBAREA LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
```

```
     LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL               B        4.89      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) =    4.89      SUBAREA RUNOFF(CFS) =    9.67
  EFFECTIVE AREA(ACRES) =      7.51    AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        7.5        PEAK FLOW RATE(CFS) =      14.84

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.63   HALFSTREET FLOOD WIDTH(FEET) =  31.40
  FLOW VELOCITY(FEET/SEC.) =  1.09   DEPTH*VELOCITY(FT*FT/SEC.) =   0.68
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  485.0 FT WITH ELEVATION-DROP =   0.4 FT, IS   11.3 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE     49.00
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     49.00 =     785.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     49.00 TO NODE     50.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    165.60  DOWNSTREAM(FEET) =    165.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =   180.00   CHANNEL SLOPE =  0.0011
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   0.020
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      14.84
  FLOW VELOCITY(FEET/SEC.) =   2.74   FLOW DEPTH(FEET) =   1.08
  TRAVEL TIME(MIN.) =   1.09   Tc(MIN.) =   20.70
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     50.00 =     965.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     50.00 TO NODE     50.00 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.) =   20.70
  RAINFALL INTENSITY(INCH/HR) =   2.16
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       7.51
  TOTAL STREAM AREA(ACRES) =       7.51
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      14.84

****************************************************************************
  FLOW PROCESS FROM NODE     50.00 TO NODE     50.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
```

```
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   665.00
 ELEVATION DATA: UPSTREAM(FEET) =    167.20  DOWNSTREAM(FEET) =    165.40

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.351
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.767
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 COMMERCIAL                 B        6.31      0.30      0.100    56   13.35
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =     15.54
 TOTAL AREA(ACRES) =      6.31   PEAK FLOW RATE(CFS) =     15.54

****************************************************************************
 FLOW PROCESS FROM NODE     50.00 TO NODE     50.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   13.35
 RAINFALL INTENSITY(INCH/HR) =   2.77
 AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       6.31
 TOTAL STREAM AREA(ACRES) =       6.31
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      15.54

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1       14.84   20.70    2.159  0.30( 0.03) 0.10       7.5      32.00
     2       15.54   13.35    2.767  0.30( 0.03) 0.10       6.3      50.00

 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       27.85   13.35    2.767  0.30( 0.03) 0.10      11.2      50.00
     2       26.93   20.70    2.159  0.30( 0.03) 0.10      13.8      32.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      27.85    Tc(MIN.) =    13.35
 EFFECTIVE AREA(ACRES) =      11.15   AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =       13.8
 LONGEST FLOWPATH FROM NODE     32.00 TO NODE     50.00 =     965.00 FEET.
```

```
****************************************************************************
 FLOW PROCESS FROM NODE     50.00 TO NODE     47.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   162.40  DOWNSTREAM(FEET) =   149.90
 FLOW LENGTH(FEET) =   185.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  12.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  18.03
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      27.85
 PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =   13.52
 LONGEST FLOWPATH FROM NODE     32.00 TO NODE     47.00 =    1150.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     47.00 TO NODE     47.00 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       27.85   13.52    2.747  0.30( 0.03) 0.10      11.2      50.00
     2       26.93   20.87    2.149  0.30( 0.03) 0.10      13.8      32.00
 LONGEST FLOWPATH FROM NODE     32.00 TO NODE     47.00 =    1150.00 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       27.09    8.84    3.495  0.31( 0.10) 0.33       7.6      43.00
     2       27.29    9.01    3.457  0.31( 0.10) 0.33       7.8      45.00
     3       27.69    9.39    3.376  0.31( 0.10) 0.33       8.1      30.00
     4       27.99    9.85    3.287  0.31( 0.10) 0.33       8.4      38.00
     5       28.24   10.24    3.214  0.31( 0.10) 0.33       8.7      30.00
     6       28.28   10.36    3.193  0.31( 0.10) 0.33       8.8      36.00
     7       28.51   11.09    3.074  0.31( 0.10) 0.33       9.3      14.00
     8       28.61   11.37    3.030  0.31( 0.10) 0.33       9.5      26.00
     9       28.61   11.41    3.024  0.31( 0.10) 0.33       9.5      27.00
    10       28.75   12.13    2.921  0.31( 0.10) 0.33      10.0      20.00
    11       28.70   12.61    2.858  0.31( 0.10) 0.33      10.2      17.00
    12       28.70   12.61    2.857  0.31( 0.10) 0.33      10.2      23.00
    13       28.68   12.66    2.851  0.31( 0.10) 0.33      10.3      29.00
    14       28.12   13.95    2.699  0.31( 0.10) 0.32      10.7      39.00
    15       28.10   13.97    2.696  0.31( 0.10) 0.32      10.8      34.00
    16       27.77   14.32    2.660  0.31( 0.10) 0.32      10.8      24.00
    17       25.03   17.44    2.379  0.31( 0.10) 0.32      11.1      12.00
    18       22.38   20.94    2.144  0.31( 0.10) 0.32      11.2      10.00
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     47.00 =    2005.00 FEET.

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

```
      1       50.30    8.84    3.495  0.31( 0.07) 0.22      14.9      43.00
      2       50.69    9.01    3.457  0.31( 0.07) 0.22      15.2      45.00
      3       51.51    9.39    3.376  0.31( 0.07) 0.22      15.8      30.00
      4       52.31    9.85    3.287  0.31( 0.07) 0.22      16.6      38.00
      5       52.97   10.24    3.214  0.31( 0.07) 0.22      17.2      30.00
      6       53.14   10.36    3.193  0.31( 0.07) 0.22      17.4      36.00
      7       54.09   11.09    3.074  0.31( 0.07) 0.21      18.4      14.00
      8       54.47   11.37    3.030  0.31( 0.07) 0.21      18.9      26.00
      9       54.51   11.41    3.024  0.31( 0.07) 0.21      18.9      27.00
     10       55.34   12.13    2.921  0.31( 0.07) 0.21      20.0      20.00
     11       55.73   12.61    2.858  0.31( 0.06) 0.21      20.6      17.00
     12       55.74   12.61    2.857  0.31( 0.06) 0.21      20.7      23.00
     13       55.76   12.66    2.851  0.31( 0.06) 0.21      20.7      29.00
     14       56.16   13.52    2.747  0.31( 0.06) 0.21      21.7      50.00
     15       55.92   13.95    2.699  0.31( 0.06) 0.21      22.1      39.00
     16       55.89   13.97    2.696  0.31( 0.06) 0.21      22.1      34.00
     17       55.52   14.32    2.660  0.31( 0.06) 0.21      22.2      24.00
     18       52.39   17.44    2.379  0.31( 0.06) 0.20      23.7      12.00
     19       49.37   20.87    2.149  0.31( 0.06) 0.20      25.0      32.00
     20       49.26   20.94    2.144  0.31( 0.06) 0.20      25.0      10.00
   TOTAL AREA(ACRES) =        25.0

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       56.16  Tc(MIN.) =   13.522
  EFFECTIVE AREA(ACRES) =     21.74  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.31  AREA-AVERAGED Ap =  0.22
  TOTAL AREA(ACRES) =       25.0
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     47.00 =    2005.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     47.00 TO NODE     47.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     47.00 TO NODE     47.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.52
  RAINFALL INTENSITY(INCH/HR) =   2.75
  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.31
  AREA-AVERAGED Ap =  0.21
  EFFECTIVE STREAM AREA(ACRES) =      21.74
  TOTAL STREAM AREA(ACRES) =      25.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      56.16

****************************************************************************
  FLOW PROCESS FROM NODE     51.00 TO NODE     52.00 IS CODE =  21
----------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   140.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.70  DOWNSTREAM(FEET) =    166.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.386
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.600
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS              B        0.64      0.30     0.350    56    8.39
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      2.01
  TOTAL AREA(ACRES) =      0.64   PEAK FLOW RATE(CFS) =      2.01

********************************************************************************
  FLOW PROCESS FROM NODE     52.00 TO NODE     47.00 IS CODE =  31
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   156.00  DOWNSTREAM(FEET) =   149.90
  FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   3.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.40
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.01
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    8.44
  LONGEST FLOWPATH FROM NODE     51.00 TO NODE     47.00 =     180.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE     47.00 TO NODE     47.00 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.) =    8.44
  RAINFALL INTENSITY(INCH/HR) =   3.59
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.64
  TOTAL STREAM AREA(ACRES) =       0.64
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.01

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
```

1	50.30	8.84	3.495	0.31(0.07)	0.22	14.9	43.00
1	50.69	9.01	3.457	0.31(0.07)	0.22	15.2	45.00
1	51.51	9.39	3.376	0.31(0.07)	0.22	15.8	30.00
1	52.31	9.85	3.287	0.31(0.07)	0.22	16.6	38.00
1	52.97	10.24	3.214	0.31(0.07)	0.22	17.2	30.00
1	53.14	10.36	3.193	0.31(0.07)	0.22	17.4	36.00
1	54.09	11.09	3.074	0.31(0.07)	0.21	18.4	14.00
1	54.47	11.37	3.030	0.31(0.07)	0.21	18.9	26.00
1	54.51	11.41	3.024	0.31(0.07)	0.21	18.9	27.00
1	55.34	12.13	2.921	0.31(0.07)	0.21	20.0	20.00
1	55.73	12.61	2.858	0.31(0.06)	0.21	20.6	17.00
1	55.74	12.61	2.857	0.31(0.06)	0.21	20.7	23.00
1	55.76	12.66	2.851	0.31(0.06)	0.21	20.7	29.00
1	56.16	13.52	2.747	0.31(0.06)	0.21	21.7	50.00
1	55.92	13.95	2.699	0.31(0.06)	0.21	22.1	39.00
1	55.89	13.97	2.696	0.31(0.06)	0.21	22.1	34.00
1	55.52	14.32	2.660	0.31(0.06)	0.21	22.2	24.00
1	52.39	17.44	2.379	0.31(0.06)	0.20	23.7	12.00
1	49.37	20.87	2.149	0.31(0.06)	0.20	25.0	32.00
1	49.26	20.94	2.144	0.31(0.06)	0.20	25.0	10.00
2	2.01	8.44	3.587	0.30(0.10)	0.35	0.6	51.00

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	51.34	8.44	3.587	0.31(0.07)	0.22	14.9	51.00
2	52.26	8.84	3.495	0.31(0.07)	0.22	15.5	43.00
3	52.63	9.01	3.457	0.31(0.07)	0.22	15.8	45.00
4	53.41	9.39	3.376	0.31(0.07)	0.22	16.5	30.00
5	54.15	9.85	3.287	0.31(0.07)	0.22	17.2	38.00
6	54.77	10.24	3.214	0.31(0.07)	0.22	17.8	30.00
7	54.92	10.36	3.193	0.31(0.07)	0.22	18.0	36.00
8	55.80	11.09	3.074	0.31(0.07)	0.22	19.1	14.00
9	56.16	11.37	3.030	0.31(0.07)	0.22	19.5	26.00
10	56.20	11.41	3.024	0.31(0.07)	0.22	19.6	27.00
11	56.97	12.13	2.921	0.31(0.07)	0.22	20.6	20.00
12	57.32	12.61	2.858	0.31(0.07)	0.22	21.3	17.00
13	57.33	12.61	2.857	0.31(0.07)	0.22	21.3	23.00
14	57.35	12.66	2.851	0.31(0.07)	0.22	21.3	29.00
15	57.69	13.52	2.747	0.31(0.07)	0.21	22.4	50.00
16	57.42	13.95	2.699	0.31(0.07)	0.21	22.7	39.00
17	57.39	13.97	2.696	0.31(0.07)	0.21	22.7	34.00
18	57.00	14.32	2.660	0.31(0.06)	0.21	22.9	24.00
19	53.70	17.44	2.379	0.31(0.06)	0.21	24.3	12.00
20	50.55	20.87	2.149	0.31(0.06)	0.20	25.6	32.00
21	50.44	20.94	2.144	0.31(0.06)	0.20	25.6	10.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 57.69 Tc(MIN.) = 13.52
EFFECTIVE AREA(ACRES) = 22.38 AREA-AVERAGED Fm(INCH/HR) = 0.07
AREA-AVERAGED Fp(INCH/HR) = 0.31 AREA-AVERAGED Ap = 0.21

```
  TOTAL AREA(ACRES) =       25.6
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     47.00 =    2005.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     47.00 TO NODE     53.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   149.80  DOWNSTREAM(FEET) =   149.70
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  54.0 INCH PIPE IS  42.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.34
  ESTIMATED PIPE DIAMETER(INCH) =  54.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      57.69
  PIPE TRAVEL TIME(MIN.) =   0.38    Tc(MIN.) =   13.91
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     53.00 =    2105.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     53.00 TO NODE     53.00 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.) =   13.91
  RAINFALL INTENSITY(INCH/HR) =   2.70
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.31
  AREA-AVERAGED Ap =  0.21
  EFFECTIVE STREAM AREA(ACRES) =      22.38
  TOTAL STREAM AREA(ACRES) =      25.64
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      57.69

****************************************************************************
  FLOW PROCESS FROM NODE     38.00 TO NODE     54.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   265.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.40  DOWNSTREAM(FEET) =    165.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.340
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.034
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.80      0.30     0.350    56   11.34
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      2.11
  TOTAL AREA(ACRES) =      0.80   PEAK FLOW RATE(CFS) =      2.11
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     54.00 TO NODE     53.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   149.80  DOWNSTREAM(FEET) =   149.70
  FLOW LENGTH(FEET) =    70.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.24
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.11
  PIPE TRAVEL TIME(MIN.) =   0.52    Tc(MIN.) =   11.86
  LONGEST FLOWPATH FROM NODE     38.00 TO NODE     53.00 =     335.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     53.00 TO NODE     53.00 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.) =   11.86
  RAINFALL INTENSITY(INCH/HR) =   2.96
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.80
  TOTAL STREAM AREA(ACRES) =       0.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.11

****************************************************************************
  FLOW PROCESS FROM NODE     55.00 TO NODE     56.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   130.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    166.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.214
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.413
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.19      0.30      0.350    56    9.21
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.57
  TOTAL AREA(ACRES) =      0.19   PEAK FLOW RATE(CFS) =      0.57

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

```
 FLOW PROCESS FROM NODE     56.00 TO NODE     53.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   156.00  DOWNSTREAM(FEET) =   149.70
 FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   1.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.66
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.57
 PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    9.29
 LONGEST FLOWPATH FROM NODE     55.00 TO NODE     53.00 =     170.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     53.00 TO NODE     53.00 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.) =    9.29
 RAINFALL INTENSITY(INCH/HR) =   3.40
 AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.35
 EFFECTIVE STREAM AREA(ACRES) =       0.19
 TOTAL STREAM AREA(ACRES) =       0.19
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.57

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       51.34    8.84    3.494  0.31( 0.07) 0.22      14.9      51.00
     1       52.26    9.22    3.411  0.31( 0.07) 0.22      15.5      43.00
     1       52.63    9.39    3.376  0.31( 0.07) 0.22      15.8      45.00
     1       53.41    9.78    3.300  0.31( 0.07) 0.22      16.5      30.00
     1       54.15   10.23    3.216  0.31( 0.07) 0.22      17.2      38.00
     1       54.77   10.63    3.147  0.31( 0.07) 0.22      17.8      30.00
     1       54.92   10.75    3.128  0.31( 0.07) 0.22      18.0      36.00
     1       55.80   11.47    3.015  0.31( 0.07) 0.22      19.1      14.00
     1       56.16   11.76    2.973  0.31( 0.07) 0.22      19.5      26.00
     1       56.20   11.80    2.968  0.31( 0.07) 0.22      19.6      27.00
     1       56.97   12.52    2.870  0.31( 0.07) 0.22      20.6      20.00
     1       57.32   12.99    2.810  0.31( 0.07) 0.22      21.3      17.00
     1       57.33   13.00    2.809  0.31( 0.07) 0.22      21.3      23.00
     1       57.35   13.05    2.803  0.31( 0.07) 0.22      21.3      29.00
     1       57.69   13.91    2.704  0.31( 0.07) 0.21      22.4      50.00
     1       57.42   14.33    2.658  0.31( 0.07) 0.21      22.7      39.00
     1       57.39   14.36    2.655  0.31( 0.07) 0.21      22.7      34.00
     1       57.00   14.70    2.620  0.31( 0.06) 0.21      22.9      24.00
     1       53.70   17.82    2.349  0.31( 0.06) 0.21      24.3      12.00
```

```
     1       50.55   21.27    2.126  0.31( 0.06) 0.20      25.6      32.00
     1       50.44   21.34    2.122  0.31( 0.06) 0.20      25.6      10.00
     2        2.11   11.86    2.958  0.30( 0.11) 0.35       0.8      38.00
     3        0.57    9.29    3.397  0.30( 0.11) 0.35       0.2      55.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       53.77    8.84    3.494  0.31( 0.07) 0.23      15.7      51.00
      2       54.72    9.22    3.411  0.31( 0.07) 0.23      16.4      43.00
      3       54.88    9.29    3.397  0.31( 0.07) 0.23      16.5      55.00
      4       55.11    9.39    3.376  0.31( 0.07) 0.23      16.7      45.00
      5       55.90    9.78    3.300  0.31( 0.07) 0.23      17.3      30.00
      6       56.67   10.23    3.216  0.31( 0.07) 0.23      18.1      38.00
      7       57.31   10.63    3.147  0.31( 0.07) 0.23      18.7      30.00
      8       57.47   10.75    3.128  0.31( 0.07) 0.23      18.9      36.00
      9       58.38   11.47    3.015  0.31( 0.07) 0.23      20.0      14.00
     10       58.75   11.76    2.973  0.31( 0.07) 0.22      20.5      26.00
     11       58.80   11.80    2.968  0.31( 0.07) 0.22      20.5      27.00
     12       58.87   11.86    2.958  0.31( 0.07) 0.22      20.7      38.00
     13       59.49   12.52    2.870  0.31( 0.07) 0.22      21.6      20.00
     14       59.79   12.99    2.810  0.31( 0.07) 0.22      22.3      17.00
     15       59.79   13.00    2.809  0.31( 0.07) 0.22      22.3      23.00
     16       59.81   13.05    2.803  0.31( 0.07) 0.22      22.3      29.00
     17       60.05   13.91    2.704  0.31( 0.07) 0.22      23.4      50.00
     18       59.74   14.33    2.658  0.31( 0.07) 0.22      23.7      39.00
     19       59.71   14.36    2.655  0.31( 0.07) 0.22      23.7      34.00
     20       59.29   14.70    2.620  0.31( 0.07) 0.22      23.9      24.00
     21       55.75   17.82    2.349  0.31( 0.06) 0.21      25.3      12.00
     22       52.39   21.27    2.126  0.31( 0.06) 0.21      26.6      32.00
     23       52.28   21.34    2.122  0.31( 0.06) 0.21      26.6      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      60.05    Tc(MIN.) =    13.91
  EFFECTIVE AREA(ACRES) =      23.37   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.31  AREA-AVERAGED Ap =  0.22
  TOTAL AREA(ACRES) =       26.6
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     53.00 =    2105.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     53.00 TO NODE     57.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   149.70  DOWNSTREAM(FEET) =   149.10
  FLOW LENGTH(FEET) =   280.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  36.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.86
  ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      60.05
```

```
  PIPE TRAVEL TIME(MIN.) =   0.80    Tc(MIN.) =   14.70
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     57.00 =    2385.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     58.00 TO NODE     57.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   240.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.60

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.853
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.286
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.46      0.30      0.350    56    9.85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.32
  TOTAL AREA(ACRES) =      0.46   PEAK FLOW RATE(CFS) =      1.32

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 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.) =    9.85
  RAINFALL INTENSITY(INCH/HR) =   3.29
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.46
  TOTAL STREAM AREA(ACRES) =       0.46
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.32

****************************************************************************
  FLOW PROCESS FROM NODE     59.00 TO NODE     57.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   265.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.80  DOWNSTREAM(FEET) =    165.80
```

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.239
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.215
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.57      0.30     0.350    56   10.24
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.60
  TOTAL AREA(ACRES) =      0.57   PEAK FLOW RATE(CFS) =      1.60

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 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.) =   10.24
  RAINFALL INTENSITY(INCH/HR) =   3.22
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.57
  TOTAL STREAM AREA(ACRES) =       0.57
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.60

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        1.32    9.85    3.286  0.30( 0.11) 0.35       0.5      58.00
      2        1.60   10.24    3.215  0.30( 0.11) 0.35       0.6      59.00

  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        2.89    9.85    3.286  0.30( 0.11) 0.35       1.0      58.00
      2        2.88   10.24    3.215  0.30( 0.11) 0.35       1.0      59.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       2.89    Tc(MIN.) =     9.85
  EFFECTIVE AREA(ACRES) =       1.01   AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        1.0
  LONGEST FLOWPATH FROM NODE     59.00 TO NODE     57.00 =     265.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 IS CODE =  11
```

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

==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	2.89	9.85	3.286	0.30(0.11)	0.35	1.0	58.00
2	2.88	10.24	3.215	0.30(0.11)	0.35	1.0	59.00

LONGEST FLOWPATH FROM NODE 59.00 TO NODE 57.00 = 265.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	53.77	9.67	3.321	0.31(0.07)	0.23	15.7	51.00
2	54.72	10.03	3.253	0.31(0.07)	0.23	16.4	43.00
3	54.88	10.10	3.240	0.31(0.07)	0.23	16.5	55.00
4	55.11	10.20	3.222	0.31(0.07)	0.23	16.7	45.00
5	55.90	10.58	3.155	0.31(0.07)	0.23	17.3	30.00
6	56.67	11.04	3.082	0.31(0.07)	0.23	18.1	38.00
7	57.31	11.43	3.021	0.31(0.07)	0.23	18.7	30.00
8	57.47	11.55	3.003	0.31(0.07)	0.23	18.9	36.00
9	58.38	12.27	2.902	0.31(0.07)	0.23	20.0	14.00
10	58.75	12.56	2.865	0.31(0.07)	0.22	20.5	26.00
11	58.80	12.59	2.860	0.31(0.07)	0.22	20.5	27.00
12	58.87	12.66	2.851	0.31(0.07)	0.22	20.7	38.00
13	59.49	13.31	2.771	0.31(0.07)	0.22	21.6	20.00
14	59.79	13.79	2.717	0.31(0.07)	0.22	22.3	17.00
15	59.79	13.80	2.716	0.31(0.07)	0.22	22.3	23.00
16	59.81	13.84	2.711	0.31(0.07)	0.22	22.3	29.00
17	60.05	14.70	2.620	0.31(0.07)	0.22	23.4	50.00
18	59.74	15.13	2.578	0.31(0.07)	0.22	23.7	39.00
19	59.71	15.15	2.575	0.31(0.07)	0.22	23.7	34.00
20	59.29	15.50	2.543	0.31(0.07)	0.22	23.9	24.00
21	55.75	18.63	2.291	0.31(0.06)	0.21	25.3	12.00
22	52.39	22.10	2.080	0.31(0.06)	0.21	26.6	32.00
23	52.28	22.17	2.076	0.31(0.06)	0.21	26.6	10.00

LONGEST FLOWPATH FROM NODE 10.00 TO NODE 57.00 = 2385.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	56.63	9.67	3.321	0.30(0.07)	0.24	16.6	51.00
2	57.14	9.85	3.286	0.30(0.07)	0.24	17.0	58.00
3	57.61	10.03	3.253	0.30(0.07)	0.24	17.4	43.00
4	57.76	10.10	3.240	0.30(0.07)	0.24	17.5	55.00
5	57.99	10.20	3.222	0.30(0.07)	0.24	17.7	45.00
6	58.07	10.24	3.215	0.30(0.07)	0.24	17.8	59.00
7	58.73	10.58	3.155	0.31(0.07)	0.23	18.4	30.00
8	59.42	11.04	3.082	0.31(0.07)	0.23	19.1	38.00
9	60.01	11.43	3.021	0.31(0.07)	0.23	19.8	30.00
10	60.15	11.55	3.003	0.31(0.07)	0.23	20.0	36.00
11	60.98	12.27	2.902	0.31(0.07)	0.23	21.1	14.00
12	61.31	12.56	2.865	0.31(0.07)	0.23	21.5	26.00

```
    13       61.35   12.59    2.860  0.31( 0.07) 0.23      21.6      27.00
    14       61.42   12.66    2.851  0.31( 0.07) 0.23      21.7      38.00
    15       61.96   13.31    2.771  0.31( 0.07) 0.23      22.7      20.00
    16       62.21   13.79    2.717  0.31( 0.07) 0.23      23.3      17.00
    17       62.21   13.80    2.716  0.31( 0.07) 0.23      23.3      23.00
    18       62.23   13.84    2.711  0.31( 0.07) 0.23      23.4      29.00
    19       62.38   14.70    2.620  0.31( 0.07) 0.22      24.4      50.00
    20       62.04   15.13    2.578  0.31( 0.07) 0.22      24.7      39.00
    21       62.00   15.15    2.575  0.31( 0.07) 0.22      24.7      34.00
    22       61.55   15.50    2.543  0.31( 0.07) 0.22      24.9      24.00
    23       57.78   18.63    2.291  0.30( 0.07) 0.22      26.3      12.00
    24       54.22   22.10    2.080  0.30( 0.06) 0.21      27.7      32.00
    25       54.10   22.17    2.076  0.30( 0.06) 0.21      27.7      10.00
  TOTAL AREA(ACRES) =        27.7

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       62.38  Tc(MIN.) =   14.703
 EFFECTIVE AREA(ACRES) =     24.40  AREA-AVERAGED Fm(INCH/HR) =  0.07
 AREA-AVERAGED Fp(INCH/HR) =  0.31  AREA-AVERAGED Ap =  0.22
 TOTAL AREA(ACRES) =       27.7
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     57.00 =    2385.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE     60.00 TO NODE     61.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   200.00
 ELEVATION DATA: UPSTREAM(FEET) =    167.00  DOWNSTREAM(FEET) =    166.20

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.043
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.449
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 CONDOMINIUMS               B        0.27      0.30     0.350    56    9.04
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
 SUBAREA RUNOFF(CFS) =      0.81
 TOTAL AREA(ACRES) =      0.27   PEAK FLOW RATE(CFS) =      0.81
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     61.00 TO NODE     62.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   166.20  DOWNSTREAM(FEET) =   165.30
  FLOW LENGTH(FEET) =   210.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   5.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.65
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.81
  PIPE TRAVEL TIME(MIN.) =   1.32    Tc(MIN.) =   10.36
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     62.00 =     410.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     62.00 TO NODE     62.00 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.) =   10.36
  RAINFALL INTENSITY(INCH/HR) =   3.19
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.27
  TOTAL STREAM AREA(ACRES) =       0.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.81

****************************************************************************
  FLOW PROCESS FROM NODE     63.00 TO NODE     62.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   270.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.984
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.261
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.70      0.30      0.350    56    9.98
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.99
  TOTAL AREA(ACRES) =      0.70   PEAK FLOW RATE(CFS) =      1.99
```

```
****************************************************************************
 FLOW PROCESS FROM NODE     62.00 TO NODE     62.00 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.) =    9.98
 RAINFALL INTENSITY(INCH/HR) =   3.26
 AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.35
 EFFECTIVE STREAM AREA(ACRES) =       0.70
 TOTAL STREAM AREA(ACRES) =       0.70
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.99

****************************************************************************
 FLOW PROCESS FROM NODE     64.00 TO NODE     62.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   295.00
 ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.30

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   20.647
 *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.162
 SUBAREA Tc AND LOSS RATE DATA(AMC  II):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 AGRICULTURAL FAIR COVER
 "PASTURE,IRRIGATED"        B        0.27      0.30     1.000    65   20.65
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
 SUBAREA RUNOFF(CFS) =      0.45
 TOTAL AREA(ACRES) =      0.27   PEAK FLOW RATE(CFS) =      0.45

****************************************************************************
 FLOW PROCESS FROM NODE     62.00 TO NODE     62.00 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.) =   20.65
 RAINFALL INTENSITY(INCH/HR) =   2.16
 AREA-AVERAGED Fm(INCH/HR) =  0.30
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  1.00
 EFFECTIVE STREAM AREA(ACRES) =       0.27
 TOTAL STREAM AREA(ACRES) =       0.27
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.45
```

```
 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        0.81   10.36    3.193  0.30( 0.10) 0.35       0.3      60.00
     2        1.99    9.98    3.261  0.30( 0.11) 0.35       0.7      63.00
     3        0.45   20.65    2.162  0.30( 0.30) 1.00       0.3      64.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  3 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        3.14    9.98    3.261  0.30( 0.13) 0.43       1.1      63.00
     2        3.11   10.36    3.193  0.30( 0.13) 0.43       1.1      60.00
     3        2.29   20.65    2.162  0.30( 0.15) 0.49       1.2      64.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       3.14    Tc(MIN.) =     9.98
 EFFECTIVE AREA(ACRES) =       1.09   AREA-AVERAGED Fm(INCH/HR) =  0.13
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.43
 TOTAL AREA(ACRES) =        1.2
 LONGEST FLOWPATH FROM NODE     60.00 TO NODE     62.00 =     410.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     62.00 TO NODE     57.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   156.00  DOWNSTREAM(FEET) =   149.10
 FLOW LENGTH(FEET) =   245.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.55
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       3.14
 PIPE TRAVEL TIME(MIN.) =   0.54    Tc(MIN.) =   10.52
 LONGEST FLOWPATH FROM NODE     60.00 TO NODE     57.00 =     655.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 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        3.14   10.52    3.165  0.30( 0.13) 0.43       1.1      63.00
     2        3.11   10.91    3.102  0.30( 0.13) 0.43       1.1      60.00
     3        2.29   21.23    2.128  0.30( 0.15) 0.49       1.2      64.00
 LONGEST FLOWPATH FROM NODE     60.00 TO NODE     57.00 =     655.00 FEET.
```

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	56.63	9.67	3.321	0.30(0.07)	0.24	16.6	51.00
2	57.14	9.85	3.286	0.30(0.07)	0.24	17.0	58.00
3	57.61	10.03	3.253	0.30(0.07)	0.24	17.4	43.00
4	57.76	10.10	3.240	0.30(0.07)	0.24	17.5	55.00
5	57.99	10.20	3.222	0.30(0.07)	0.24	17.7	45.00
6	58.07	10.24	3.215	0.30(0.07)	0.24	17.8	59.00
7	58.73	10.58	3.155	0.31(0.07)	0.23	18.4	30.00
8	59.42	11.04	3.082	0.31(0.07)	0.23	19.1	38.00
9	60.01	11.43	3.021	0.31(0.07)	0.23	19.8	30.00
10	60.15	11.55	3.003	0.31(0.07)	0.23	20.0	36.00
11	60.98	12.27	2.902	0.31(0.07)	0.23	21.1	14.00
12	61.31	12.56	2.865	0.31(0.07)	0.23	21.5	26.00
13	61.35	12.59	2.860	0.31(0.07)	0.23	21.6	27.00
14	61.42	12.66	2.851	0.31(0.07)	0.23	21.7	38.00
15	61.96	13.31	2.771	0.31(0.07)	0.23	22.7	20.00
16	62.21	13.79	2.717	0.31(0.07)	0.23	23.3	17.00
17	62.21	13.80	2.716	0.31(0.07)	0.23	23.3	23.00
18	62.23	13.84	2.711	0.31(0.07)	0.23	23.4	29.00
19	62.38	14.70	2.620	0.31(0.07)	0.22	24.4	50.00
20	62.04	15.13	2.578	0.31(0.07)	0.22	24.7	39.00
21	62.00	15.15	2.575	0.31(0.07)	0.22	24.7	34.00
22	61.55	15.50	2.543	0.31(0.07)	0.22	24.9	24.00
23	57.78	18.63	2.291	0.30(0.07)	0.22	26.3	12.00
24	54.22	22.10	2.080	0.30(0.06)	0.21	27.7	32.00
25	54.10	22.17	2.076	0.30(0.06)	0.21	27.7	10.00

LONGEST FLOWPATH FROM NODE 10.00 TO NODE 57.00 = 2385.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	59.66	9.67	3.321	0.30(0.08)	0.25	17.7	51.00
2	60.19	9.85	3.286	0.30(0.08)	0.25	18.0	58.00
3	60.68	10.03	3.253	0.30(0.08)	0.25	18.4	43.00
4	60.85	10.10	3.240	0.30(0.08)	0.25	18.6	55.00
5	61.09	10.20	3.222	0.30(0.08)	0.25	18.8	45.00
6	61.17	10.24	3.215	0.30(0.08)	0.25	18.8	59.00
7	61.75	10.52	3.165	0.30(0.07)	0.25	19.4	63.00
8	61.86	10.58	3.155	0.30(0.07)	0.25	19.5	30.00
9	62.34	10.91	3.102	0.30(0.07)	0.25	20.0	60.00
10	62.53	11.04	3.082	0.30(0.07)	0.24	20.2	38.00
11	63.08	11.43	3.021	0.30(0.07)	0.24	20.9	30.00
12	63.21	11.55	3.003	0.30(0.07)	0.24	21.1	36.00
13	63.98	12.27	2.902	0.30(0.07)	0.24	22.2	14.00
14	64.29	12.56	2.865	0.30(0.07)	0.24	22.6	26.00
15	64.33	12.59	2.860	0.30(0.07)	0.24	22.7	27.00
16	64.39	12.66	2.851	0.30(0.07)	0.24	22.8	38.00
17	64.88	13.31	2.771	0.30(0.07)	0.24	23.8	20.00
18	65.09	13.79	2.717	0.30(0.07)	0.24	24.4	17.00
19	65.09	13.80	2.716	0.30(0.07)	0.24	24.5	23.00
20	65.10	13.84	2.711	0.30(0.07)	0.24	24.5	29.00
21	65.19	14.70	2.620	0.30(0.07)	0.23	25.6	50.00

```
    22       64.81   15.13    2.578  0.30( 0.07) 0.23      25.9      39.00
    23       64.78   15.15    2.575  0.30( 0.07) 0.23      25.9      34.00
    24       64.30   15.50    2.543  0.30( 0.07) 0.23      26.1      24.00
    25       60.27   18.63    2.291  0.30( 0.07) 0.23      27.5      12.00
    26       57.40   21.23    2.128  0.30( 0.07) 0.22      28.6      64.00
    27       56.46   22.10    2.080  0.30( 0.07) 0.22      28.9      32.00
    28       56.33   22.17    2.076  0.30( 0.07) 0.22      28.9      10.00
   TOTAL AREA(ACRES) =        28.9

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       65.19  Tc(MIN.) =   14.703
  EFFECTIVE AREA(ACRES) =     25.56  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.23
  TOTAL AREA(ACRES) =       28.9
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     57.00 =    2385.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.70
  RAINFALL INTENSITY(INCH/HR) =   2.62
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.23
  EFFECTIVE STREAM AREA(ACRES) =      25.56
  TOTAL STREAM AREA(ACRES) =      28.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      65.19

****************************************************************************
  FLOW PROCESS FROM NODE     65.00 TO NODE     66.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   135.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.70  DOWNSTREAM(FEET) =    166.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.205
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.644
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.19      0.30     0.350    56    8.21
```

```
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.61
  TOTAL AREA(ACRES) =      0.19   PEAK FLOW RATE(CFS) =      0.61

****************************************************************************
  FLOW PROCESS FROM NODE     66.00 TO NODE     57.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   156.00  DOWNSTREAM(FEET) =   149.10
  FLOW LENGTH(FEET) =    45.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   1.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.70
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.61
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =    8.29
  LONGEST FLOWPATH FROM NODE     65.00 TO NODE     57.00 =     180.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 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.) =    8.29
  RAINFALL INTENSITY(INCH/HR) =   3.62
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.19
  TOTAL STREAM AREA(ACRES) =       0.19
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.61

  ** CONFLUENCE DATA **
   STREAM       Q      Tc    Intensity   Fp(Fm)      Ap      Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
      1       59.66    9.67    3.321  0.30( 0.08) 0.25       17.7       51.00
      1       60.19    9.85    3.286  0.30( 0.08) 0.25       18.0       58.00
      1       60.68   10.03    3.253  0.30( 0.08) 0.25       18.4       43.00
      1       60.85   10.10    3.240  0.30( 0.08) 0.25       18.6       55.00
      1       61.09   10.20    3.222  0.30( 0.08) 0.25       18.8       45.00
      1       61.17   10.24    3.215  0.30( 0.08) 0.25       18.8       59.00
      1       61.75   10.52    3.165  0.30( 0.07) 0.25       19.4       63.00
      1       61.86   10.58    3.155  0.30( 0.07) 0.25       19.5       30.00
      1       62.34   10.91    3.102  0.30( 0.07) 0.25       20.0       60.00
      1       62.53   11.04    3.082  0.30( 0.07) 0.24       20.2       38.00
      1       63.08   11.43    3.021  0.30( 0.07) 0.24       20.9       30.00
      1       63.21   11.55    3.003  0.30( 0.07) 0.24       21.1       36.00
      1       63.98   12.27    2.902  0.30( 0.07) 0.24       22.2       14.00
```

1	64.29	12.56	2.865	0.30(0.07)	0.24	22.6	26.00
1	64.33	12.59	2.860	0.30(0.07)	0.24	22.7	27.00
1	64.39	12.66	2.851	0.30(0.07)	0.24	22.8	38.00
1	64.88	13.31	2.771	0.30(0.07)	0.24	23.8	20.00
1	65.09	13.79	2.717	0.30(0.07)	0.24	24.4	17.00
1	65.09	13.80	2.716	0.30(0.07)	0.24	24.5	23.00
1	65.10	13.84	2.711	0.30(0.07)	0.24	24.5	29.00
1	65.19	14.70	2.620	0.30(0.07)	0.23	25.6	50.00
1	64.81	15.13	2.578	0.30(0.07)	0.23	25.9	39.00
1	64.78	15.15	2.575	0.30(0.07)	0.23	25.9	34.00
1	64.30	15.50	2.543	0.30(0.07)	0.23	26.1	24.00
1	60.27	18.63	2.291	0.30(0.07)	0.23	27.5	12.00
1	57.40	21.23	2.128	0.30(0.07)	0.22	28.6	64.00
1	56.46	22.10	2.080	0.30(0.07)	0.22	28.9	32.00
1	56.33	22.17	2.076	0.30(0.07)	0.22	28.9	10.00
2	0.61	8.29	3.623	0.30(0.11)	0.35	0.2	65.00

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	56.53	8.29	3.623	0.30(0.08)	0.25	15.3	65.00
2	60.21	9.67	3.321	0.30(0.08)	0.25	17.8	51.00
3	60.74	9.85	3.286	0.30(0.08)	0.25	18.2	58.00
4	61.22	10.03	3.253	0.30(0.08)	0.25	18.6	43.00
5	61.38	10.10	3.240	0.30(0.08)	0.25	18.7	55.00
6	61.62	10.20	3.222	0.30(0.08)	0.25	18.9	45.00
7	61.71	10.24	3.215	0.30(0.08)	0.25	19.0	59.00
8	62.28	10.52	3.165	0.30(0.08)	0.25	19.5	63.00
9	62.39	10.58	3.155	0.30(0.08)	0.25	19.6	30.00
10	62.85	10.91	3.102	0.30(0.07)	0.25	20.2	60.00
11	63.04	11.04	3.082	0.30(0.07)	0.25	20.4	38.00
12	63.58	11.43	3.021	0.30(0.07)	0.24	21.1	30.00
13	63.71	11.55	3.003	0.30(0.07)	0.24	21.3	36.00
14	64.46	12.27	2.902	0.30(0.07)	0.24	22.4	14.00
15	64.76	12.56	2.865	0.30(0.07)	0.24	22.8	26.00
16	64.80	12.59	2.860	0.30(0.07)	0.24	22.9	27.00
17	64.86	12.66	2.851	0.30(0.07)	0.24	23.0	38.00
18	65.34	13.31	2.771	0.30(0.07)	0.24	24.0	20.00
19	65.54	13.79	2.717	0.30(0.07)	0.24	24.6	17.00
20	65.54	13.80	2.716	0.30(0.07)	0.24	24.6	23.00
21	65.55	13.84	2.711	0.30(0.07)	0.24	24.7	29.00
22	65.63	14.70	2.620	0.30(0.07)	0.24	25.7	50.00
23	65.24	15.13	2.578	0.30(0.07)	0.24	26.1	39.00
24	65.20	15.15	2.575	0.30(0.07)	0.24	26.1	34.00
25	64.72	15.50	2.543	0.30(0.07)	0.23	26.3	24.00
26	60.65	18.63	2.291	0.30(0.07)	0.23	27.7	12.00
27	57.75	21.23	2.128	0.30(0.07)	0.23	28.8	64.00
28	56.80	22.10	2.080	0.30(0.07)	0.22	29.1	32.00
29	56.67	22.17	2.076	0.30(0.07)	0.22	29.1	10.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:

```
  PEAK FLOW RATE(CFS) =      65.63    Tc(MIN.) =    14.70
  EFFECTIVE AREA(ACRES) =      25.75   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.24
  TOTAL AREA(ACRES) =       29.1
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     57.00 =    2385.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     67.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   149.10  DOWNSTREAM(FEET) =   148.50
  FLOW LENGTH(FEET) =   275.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  51.0 INCH PIPE IS  36.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.09
  ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      65.63
  PIPE TRAVEL TIME(MIN.) =   0.75    Tc(MIN.) =   15.46
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     67.00 =    2660.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     67.00 TO NODE     67.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     68.00 TO NODE     69.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   365.00
  ELEVATION DATA: UPSTREAM(FEET) =    168.20  DOWNSTREAM(FEET) =    167.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.404
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.025
  SUBAREA Tc 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        1.00      0.30      0.200    56   11.40
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      2.67
  TOTAL AREA(ACRES) =      1.00   PEAK FLOW RATE(CFS) =      2.67

****************************************************************************
  FLOW PROCESS FROM NODE     69.00 TO NODE     70.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   162.00  DOWNSTREAM(FEET) =   159.00
  FLOW LENGTH(FEET) =   185.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.89
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.67
  PIPE TRAVEL TIME(MIN.) =   0.52    Tc(MIN.) =   11.93
  LONGEST FLOWPATH FROM NODE     68.00 TO NODE     70.00 =     550.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     71.00 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.) =   11.93
  RAINFALL INTENSITY(INCH/HR) =   2.95
  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       1.00
  TOTAL STREAM AREA(ACRES) =       1.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.67

****************************************************************************
  FLOW PROCESS FROM NODE     71.00 TO NODE     70.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   250.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.20  DOWNSTREAM(FEET) =    166.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.688
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.138
  SUBAREA Tc 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        0.66      0.30      0.200    56   10.69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      1.83
  TOTAL AREA(ACRES) =      0.66   PEAK FLOW RATE(CFS) =      1.83

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     70.00 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.) =   10.69
 RAINFALL INTENSITY(INCH/HR) =   3.14
 AREA-AVERAGED Fm(INCH/HR) =  0.06
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.20
 EFFECTIVE STREAM AREA(ACRES) =       0.66
 TOTAL STREAM AREA(ACRES) =       0.66
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.83

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        2.67   11.93    2.949  0.30( 0.06) 0.20       1.0      68.00
     2        1.83   10.69    3.138  0.30( 0.06) 0.20       0.7      71.00

 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        4.38   10.69    3.138  0.30( 0.06) 0.20       1.6      71.00
     2        4.38   11.93    2.949  0.30( 0.06) 0.20       1.7      68.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       4.38    Tc(MIN.) =    11.93
 EFFECTIVE AREA(ACRES) =       1.66   AREA-AVERAGED Fm(INCH/HR) =  0.06
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.20
 TOTAL AREA(ACRES) =        1.7
 LONGEST FLOWPATH FROM NODE     68.00 TO NODE     70.00 =     550.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE     70.00 TO NODE     70.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE     72.00 TO NODE     73.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   230.00
 ELEVATION DATA: UPSTREAM(FEET) =    168.00  DOWNSTREAM(FEET) =    166.80

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.161
```

```
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.656
  SUBAREA Tc 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        0.28      0.30     0.200    56    8.16
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      0.91
  TOTAL AREA(ACRES) =      0.28   PEAK FLOW RATE(CFS) =      0.91

****************************************************************************
  FLOW PROCESS FROM NODE     73.00 TO NODE     70.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   160.00  DOWNSTREAM(FEET) =   159.00
  FLOW LENGTH(FEET) =   270.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   5.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.59
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.91
  PIPE TRAVEL TIME(MIN.) =   1.74    Tc(MIN.) =    9.90
  LONGEST FLOWPATH FROM NODE     72.00 TO NODE     70.00 =     500.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     70.00 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.) =    9.90
  RAINFALL INTENSITY(INCH/HR) =   3.28
  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       0.28
  TOTAL STREAM AREA(ACRES) =       0.28
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.91

****************************************************************************
  FLOW PROCESS FROM NODE     72.00 TO NODE     70.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   390.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.20  DOWNSTREAM(FEET) =    166.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.956
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  2.698
```

```
  SUBAREA Tc 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        1.49      0.30     0.200    56   13.96
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      3.54
  TOTAL AREA(ACRES) =      1.49   PEAK FLOW RATE(CFS) =      3.54

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     70.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.96
  RAINFALL INTENSITY(INCH/HR) =   2.70
  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       1.49
  TOTAL STREAM AREA(ACRES) =       1.49
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       3.54

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        0.91    9.90    3.277  0.30( 0.06) 0.20       0.3      72.00
      2        3.54   13.96    2.698  0.30( 0.06) 0.20       1.5      72.00

  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        3.97    9.90    3.277  0.30( 0.06) 0.20       1.3      72.00
      2        4.28   13.96    2.698  0.30( 0.06) 0.20       1.8      72.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       4.28    Tc(MIN.) =    13.96
  EFFECTIVE AREA(ACRES) =       1.77   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.20
  TOTAL AREA(ACRES) =        1.8
  LONGEST FLOWPATH FROM NODE     72.00 TO NODE     70.00 =     500.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     70.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================
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```
 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1        3.97    9.90    3.277  0.30( 0.06) 0.20       1.3      72.00
     2        4.28   13.96    2.698  0.30( 0.06) 0.20       1.8      72.00
 LONGEST FLOWPATH FROM NODE     72.00 TO NODE     70.00 =     500.00 FEET.

 ** MEMORY BANK #  3 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1        4.38   10.69    3.138  0.30( 0.06) 0.20       1.6      71.00
     2        4.38   11.93    2.949  0.30( 0.06) 0.20       1.7      68.00
 LONGEST FLOWPATH FROM NODE     68.00 TO NODE     70.00 =     550.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1        8.20    9.90    3.277  0.30( 0.06) 0.20       2.8      72.00
     2        8.40   10.69    3.138  0.30( 0.06) 0.20       3.0      71.00
     3        8.51   11.93    2.949  0.30( 0.06) 0.20       3.2      68.00
     4        8.28   13.96    2.698  0.30( 0.06) 0.20       3.4      72.00
   TOTAL AREA(ACRES) =         3.4

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =        8.51  Tc(MIN.) =   11.928
 EFFECTIVE AREA(ACRES) =      3.21  AREA-AVERAGED Fm(INCH/HR) =  0.06
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.20
 TOTAL AREA(ACRES) =        3.4
 LONGEST FLOWPATH FROM NODE     68.00 TO NODE     70.00 =     550.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     70.00 TO NODE     70.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE     70.00 TO NODE     67.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   155.00  DOWNSTREAM(FEET) =   148.50
 FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  20.84
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       8.51
 PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =   11.95
 LONGEST FLOWPATH FROM NODE     68.00 TO NODE     67.00 =     580.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     67.00 TO NODE     67.00 IS CODE =  11
----------------------------------------------------------------------------
```

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

==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	8.20	9.93	3.272	0.30(0.06)	0.20	2.8	72.00
2	8.40	10.71	3.134	0.30(0.06)	0.20	3.0	71.00
3	8.51	11.95	2.946	0.30(0.06)	0.20	3.2	68.00
4	8.28	13.98	2.695	0.30(0.06)	0.20	3.4	72.00

LONGEST FLOWPATH FROM NODE 68.00 TO NODE 67.00 = 580.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	56.53	9.07	3.443	0.30(0.08)	0.25	15.3	65.00
2	60.21	10.44	3.179	0.30(0.08)	0.25	17.8	51.00
3	60.74	10.63	3.148	0.30(0.08)	0.25	18.2	58.00
4	61.22	10.81	3.118	0.30(0.08)	0.25	18.6	43.00
5	61.38	10.87	3.108	0.30(0.08)	0.25	18.7	55.00
6	61.62	10.97	3.091	0.30(0.08)	0.25	18.9	45.00
7	61.71	11.01	3.085	0.30(0.08)	0.25	19.0	59.00
8	62.28	11.30	3.041	0.30(0.08)	0.25	19.5	63.00
9	62.39	11.36	3.032	0.30(0.08)	0.25	19.6	30.00
10	62.85	11.68	2.984	0.30(0.07)	0.25	20.2	60.00
11	63.04	11.81	2.966	0.30(0.07)	0.25	20.4	38.00
12	63.58	12.21	2.911	0.30(0.07)	0.24	21.1	30.00
13	63.71	12.32	2.895	0.30(0.07)	0.24	21.3	36.00
14	64.46	13.04	2.804	0.30(0.07)	0.24	22.4	14.00
15	64.76	13.33	2.769	0.30(0.07)	0.24	22.8	26.00
16	64.80	13.37	2.765	0.30(0.07)	0.24	22.9	27.00
17	64.86	13.43	2.757	0.30(0.07)	0.24	23.0	38.00
18	65.34	14.09	2.684	0.30(0.07)	0.24	24.0	20.00
19	65.54	14.54	2.636	0.30(0.07)	0.24	24.6	17.00
20	65.54	14.55	2.635	0.30(0.07)	0.24	24.6	23.00
21	65.55	14.60	2.630	0.30(0.07)	0.24	24.7	29.00
22	65.63	15.46	2.547	0.30(0.07)	0.24	25.7	50.00
23	65.24	15.90	2.506	0.30(0.07)	0.24	26.1	39.00
24	65.20	15.93	2.504	0.30(0.07)	0.24	26.1	34.00
25	64.72	16.27	2.474	0.30(0.07)	0.23	26.3	24.00
26	60.65	19.40	2.239	0.30(0.07)	0.23	27.7	12.00
27	57.75	22.01	2.085	0.30(0.07)	0.23	28.8	64.00
28	56.80	22.88	2.040	0.30(0.07)	0.22	29.1	32.00
29	56.67	22.95	2.036	0.30(0.07)	0.22	29.1	10.00

LONGEST FLOWPATH FROM NODE 10.00 TO NODE 67.00 = 2660.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	64.42	9.07	3.443	0.30(0.07)	0.24	17.9	65.00
2	67.02	9.93	3.272	0.30(0.07)	0.24	19.7	72.00
3	68.55	10.44	3.179	0.30(0.07)	0.24	20.8	51.00
4	69.12	10.63	3.148	0.30(0.07)	0.24	21.2	58.00
5	69.37	10.71	3.134	0.30(0.07)	0.24	21.4	71.00

6	69.63	10.81	3.118	0.30(0.07)	0.24	21.6	43.00
7	69.80	10.87	3.108	0.30(0.07)	0.24	21.7	55.00
8	70.05	10.97	3.091	0.30(0.07)	0.24	22.0	45.00
9	70.14	11.01	3.085	0.30(0.07)	0.24	22.0	59.00
10	70.73	11.30	3.041	0.30(0.07)	0.24	22.6	63.00
11	70.84	11.36	3.032	0.30(0.07)	0.24	22.7	30.00
12	71.34	11.68	2.984	0.30(0.07)	0.24	23.4	60.00
13	71.53	11.81	2.966	0.30(0.07)	0.24	23.6	38.00
14	71.74	11.95	2.946	0.30(0.07)	0.24	23.9	68.00
15	72.06	12.21	2.911	0.30(0.07)	0.24	24.3	30.00
16	72.18	12.32	2.895	0.30(0.07)	0.24	24.5	36.00
17	72.85	13.04	2.804	0.30(0.07)	0.24	25.7	14.00
18	73.12	13.33	2.769	0.30(0.07)	0.24	26.2	26.00
19	73.15	13.37	2.765	0.30(0.07)	0.24	26.3	27.00
20	73.21	13.43	2.757	0.30(0.07)	0.24	26.4	38.00
21	73.54	13.98	2.695	0.30(0.07)	0.24	27.2	72.00
22	73.58	14.09	2.684	0.30(0.07)	0.24	27.4	20.00
23	73.64	14.54	2.636	0.30(0.07)	0.23	28.1	17.00
24	73.64	14.55	2.635	0.30(0.07)	0.23	28.1	23.00
25	73.63	14.60	2.630	0.30(0.07)	0.23	28.1	29.00
26	73.44	15.46	2.547	0.30(0.07)	0.23	29.2	50.00
27	72.93	15.90	2.506	0.30(0.07)	0.23	29.5	39.00
28	72.88	15.93	2.504	0.30(0.07)	0.23	29.5	34.00
29	72.30	16.27	2.474	0.30(0.07)	0.23	29.7	24.00
30	67.50	19.40	2.239	0.30(0.07)	0.23	31.2	12.00
31	64.11	22.01	2.085	0.30(0.07)	0.22	32.2	64.00
32	63.02	22.88	2.040	0.30(0.07)	0.22	32.5	32.00
33	62.88	22.95	2.036	0.30(0.07)	0.22	32.5	10.00

TOTAL AREA(ACRES) = 32.5

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 73.64 Tc(MIN.) = 14.550
EFFECTIVE AREA(ACRES) = 28.07 AREA-AVERAGED Fm(INCH/HR) = 0.07
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.23
TOTAL AREA(ACRES) = 32.5
LONGEST FLOWPATH FROM NODE 10.00 TO NODE 67.00 = 2660.00 FEET.

****
FLOW PROCESS FROM NODE 67.00 TO NODE 74.00 IS CODE = 31

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 148.50 DOWNSTREAM(FEET) = 148.00
FLOW LENGTH(FEET) = 280.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 54.0 INCH PIPE IS 40.4 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 5.77
ESTIMATED PIPE DIAMETER(INCH) = 54.00 NUMBER OF PIPES = 1
PIPE-FLOW(CFS) = 73.64
PIPE TRAVEL TIME(MIN.) = 0.81 Tc(MIN.) = 15.36
LONGEST FLOWPATH FROM NODE 10.00 TO NODE 74.00 = 2940.00 FEET.

****
FLOW PROCESS FROM NODE 74.00 TO NODE 74.00 IS CODE = 10

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------------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
==============================================================================

******************************************************************************
  FLOW PROCESS FROM NODE     75.00 TO NODE     76.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   275.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.00  DOWNSTREAM(FEET) =    165.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.415
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.371
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.70      0.30     0.350    56    9.41
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      2.06
  TOTAL AREA(ACRES) =      0.70   PEAK FLOW RATE(CFS) =      2.06

******************************************************************************
  FLOW PROCESS FROM NODE     76.00 TO NODE     76.00 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.) =    9.41
  RAINFALL INTENSITY(INCH/HR) =   3.37
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.70
  TOTAL STREAM AREA(ACRES) =       0.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.06

******************************************************************************
  FLOW PROCESS FROM NODE     77.00 TO NODE     76.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   255.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.00  DOWNSTREAM(FEET) =    166.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.745
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.129
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
```

```
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS                B        0.51      0.30      0.350    56   10.75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.39
  TOTAL AREA(ACRES) =      0.51   PEAK FLOW RATE(CFS) =      1.39

****************************************************************************
  FLOW PROCESS FROM NODE     76.00 TO NODE     76.00 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.) =   10.75
  RAINFALL INTENSITY(INCH/HR) =   3.13
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.51
  TOTAL STREAM AREA(ACRES) =       0.51
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.39

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        2.06    9.41    3.371  0.30( 0.11) 0.35       0.7      75.00
      2        1.39   10.75    3.129  0.30( 0.11) 0.35       0.5      77.00

  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        3.37    9.41    3.371  0.30( 0.11) 0.35       1.1      75.00
      2        3.29   10.75    3.129  0.30( 0.10) 0.35       1.2      77.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       3.37    Tc(MIN.) =     9.41
  EFFECTIVE AREA(ACRES) =       1.15   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        1.2
  LONGEST FLOWPATH FROM NODE     75.00 TO NODE     76.00 =     275.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     76.00 TO NODE     79.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   154.00  DOWNSTREAM(FEET) =   152.00
```

```
  FLOW LENGTH(FEET) =   300.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.47
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.37
  PIPE TRAVEL TIME(MIN.) =   1.12    Tc(MIN.) =   10.53
  LONGEST FLOWPATH FROM NODE     75.00 TO NODE     79.00 =     575.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     79.00 TO NODE     79.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.53
  RAINFALL INTENSITY(INCH/HR) =   3.16
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       1.15
  TOTAL STREAM AREA(ACRES) =       1.21
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       3.37

****************************************************************************
  FLOW PROCESS FROM NODE     78.00 TO NODE     79.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   200.00
  ELEVATION DATA: UPSTREAM(FEET) =    165.90  DOWNSTREAM(FEET) =    165.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.578
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.339
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.40      0.30      0.350    56    9.58
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.16
  TOTAL AREA(ACRES) =      0.40   PEAK FLOW RATE(CFS) =      1.16

****************************************************************************
  FLOW PROCESS FROM NODE     79.00 TO NODE     79.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.58
```

```
 RAINFALL INTENSITY(INCH/HR) =   3.34
 AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.35
 EFFECTIVE STREAM AREA(ACRES) =       0.40
 TOTAL STREAM AREA(ACRES) =       0.40
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.16

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        3.37   10.53    3.164  0.30( 0.11) 0.35       1.1      75.00
     1        3.29   11.87    2.957  0.30( 0.10) 0.35       1.2      77.00
     2        1.16    9.58    3.339  0.30( 0.11) 0.35       0.4      78.00

 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        4.41    9.58    3.339  0.30( 0.10) 0.35       1.4      78.00
     2        4.47   10.53    3.164  0.30( 0.11) 0.35       1.5      75.00
     3        4.32   11.87    2.957  0.30( 0.10) 0.35       1.6      77.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       4.47    Tc(MIN.) =    10.53
 EFFECTIVE AREA(ACRES) =       1.55   AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
 TOTAL AREA(ACRES) =        1.6
 LONGEST FLOWPATH FROM NODE     75.00 TO NODE     79.00 =     575.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     79.00 TO NODE     74.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   152.00  DOWNSTREAM(FEET) =   148.00
 FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
 ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   5.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  12.21
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       4.47
 PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =   10.60
 LONGEST FLOWPATH FROM NODE     75.00 TO NODE     74.00 =     625.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     74.00 TO NODE     74.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================
```

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	4.41	9.65	3.325	0.30(0.10)	0.35	1.4	78.00
2	4.47	10.60	3.152	0.30(0.11)	0.35	1.5	75.00
3	4.32	11.94	2.947	0.30(0.10)	0.35	1.6	77.00

LONGEST FLOWPATH FROM NODE 75.00 TO NODE 74.00 = 625.00 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	64.42	9.91	3.275	0.30(0.07)	0.24	17.9	65.00
2	67.02	10.76	3.126	0.30(0.07)	0.24	19.7	72.00
3	68.55	11.28	3.044	0.30(0.07)	0.24	20.8	51.00
4	69.12	11.46	3.016	0.30(0.07)	0.24	21.2	58.00
5	69.37	11.55	3.004	0.30(0.07)	0.24	21.4	71.00
6	69.63	11.62	2.993	0.30(0.07)	0.24	21.6	43.00
7	69.80	11.69	2.983	0.30(0.07)	0.24	21.7	55.00
8	70.05	11.79	2.969	0.30(0.07)	0.24	22.0	45.00
9	70.14	11.83	2.963	0.30(0.07)	0.24	22.0	59.00
10	70.73	12.11	2.924	0.30(0.07)	0.24	22.6	63.00
11	70.84	12.17	2.915	0.30(0.07)	0.24	22.7	30.00
12	71.34	12.49	2.873	0.30(0.07)	0.24	23.4	60.00
13	71.53	12.62	2.856	0.30(0.07)	0.24	23.6	38.00
14	71.74	12.76	2.838	0.30(0.07)	0.24	23.9	68.00
15	72.06	13.02	2.807	0.30(0.07)	0.24	24.3	30.00
16	72.18	13.13	2.793	0.30(0.07)	0.24	24.5	36.00
17	72.85	13.85	2.710	0.30(0.07)	0.24	25.7	14.00
18	73.12	14.14	2.678	0.30(0.07)	0.24	26.2	26.00
19	73.15	14.18	2.674	0.30(0.07)	0.24	26.3	27.00
20	73.21	14.24	2.667	0.30(0.07)	0.24	26.4	38.00
21	73.54	14.79	2.611	0.30(0.07)	0.24	27.2	72.00
22	73.58	14.90	2.600	0.30(0.07)	0.24	27.4	20.00
23	73.64	15.35	2.556	0.30(0.07)	0.23	28.1	17.00
24	73.64	15.36	2.556	0.30(0.07)	0.23	28.1	23.00
25	73.63	15.41	2.551	0.30(0.07)	0.23	28.1	29.00
26	73.44	16.27	2.474	0.30(0.07)	0.23	29.2	50.00
27	72.93	16.71	2.437	0.30(0.07)	0.23	29.5	39.00
28	72.88	16.74	2.434	0.30(0.07)	0.23	29.5	34.00
29	72.30	17.08	2.406	0.30(0.07)	0.23	29.7	24.00
30	67.50	20.24	2.186	0.30(0.07)	0.23	31.2	12.00
31	64.11	22.85	2.041	0.30(0.07)	0.22	32.2	64.00
32	63.02	23.72	1.998	0.30(0.07)	0.22	32.5	32.00
33	62.88	23.79	1.995	0.30(0.07)	0.22	32.5	10.00

LONGEST FLOWPATH FROM NODE 10.00 TO NODE 74.00 = 2940.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	68.10	9.65	3.325	0.30(0.08)	0.25	18.8	78.00
2	68.85	9.91	3.275	0.30(0.08)	0.25	19.3	65.00
3	71.01	10.60	3.152	0.30(0.08)	0.25	20.9	75.00
4	71.48	10.76	3.126	0.30(0.08)	0.25	21.2	72.00
5	72.94	11.28	3.044	0.30(0.08)	0.25	22.3	51.00

6	73.50	11.46	3.016	0.30(0.08)	0.25	22.8	58.00
7	73.74	11.55	3.004	0.30(0.08)	0.25	23.0	71.00
8	73.99	11.62	2.993	0.30(0.08)	0.25	23.2	43.00
9	74.15	11.69	2.983	0.30(0.08)	0.25	23.3	55.00
10	74.39	11.79	2.969	0.30(0.08)	0.25	23.6	45.00
11	74.47	11.83	2.963	0.30(0.08)	0.25	23.7	59.00
12	74.69	11.94	2.947	0.30(0.08)	0.25	23.9	77.00
13	75.01	12.11	2.924	0.30(0.08)	0.25	24.2	63.00
14	75.12	12.17	2.915	0.30(0.08)	0.25	24.4	30.00
15	75.54	12.49	2.873	0.30(0.08)	0.25	25.0	60.00
16	75.71	12.62	2.856	0.30(0.07)	0.25	25.2	38.00
17	75.89	12.76	2.838	0.30(0.07)	0.25	25.5	68.00
18	76.16	13.02	2.807	0.30(0.07)	0.25	25.9	30.00
19	76.26	13.13	2.793	0.30(0.07)	0.25	26.1	36.00
20	76.81	13.85	2.710	0.30(0.07)	0.24	27.3	14.00
21	77.03	14.14	2.678	0.30(0.07)	0.24	27.8	26.00
22	77.06	14.18	2.674	0.30(0.07)	0.24	27.9	27.00
23	77.10	14.24	2.667	0.30(0.07)	0.24	28.0	38.00
24	77.35	14.79	2.611	0.30(0.07)	0.24	28.9	72.00
25	77.38	14.90	2.600	0.30(0.07)	0.24	29.0	20.00
26	77.36	15.35	2.556	0.30(0.07)	0.24	29.7	17.00
27	77.36	15.36	2.556	0.30(0.07)	0.24	29.7	23.00
28	77.35	15.41	2.551	0.30(0.07)	0.24	29.7	29.00
29	77.04	16.27	2.474	0.30(0.07)	0.24	30.8	50.00
30	76.47	16.71	2.437	0.30(0.07)	0.24	31.1	39.00
31	76.42	16.74	2.434	0.30(0.07)	0.24	31.1	34.00
32	75.80	17.08	2.406	0.30(0.07)	0.24	31.3	24.00
33	70.66	20.24	2.186	0.30(0.07)	0.23	32.8	12.00
34	67.05	22.85	2.041	0.30(0.07)	0.23	33.8	64.00
35	65.90	23.72	1.998	0.30(0.07)	0.23	34.1	32.00
36	65.76	23.79	1.995	0.30(0.07)	0.23	34.1	10.00

TOTAL AREA(ACRES) = 34.1

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 77.38 Tc(MIN.) = 14.896
EFFECTIVE AREA(ACRES) = 29.02 AREA-AVERAGED Fm(INCH/HR) = 0.07
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.24
TOTAL AREA(ACRES) = 34.1
LONGEST FLOWPATH FROM NODE 10.00 TO NODE 74.00 = 2940.00 FEET.

```
****************************************************************************
 FLOW PROCESS FROM NODE     74.00 TO NODE     74.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE     74.00 TO NODE     74.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   14.90
```

```
  RAINFALL INTENSITY(INCH/HR) =   2.60
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.24
  EFFECTIVE STREAM AREA(ACRES) =      29.02
  TOTAL STREAM AREA(ACRES) =      34.13
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      77.38

****************************************************************************
  FLOW PROCESS FROM NODE     59.00 TO NODE     74.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.80  DOWNSTREAM(FEET) =    165.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.807
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.295
  SUBAREA Tc AND LOSS RATE DATA(AMC  II):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.41      0.30     0.350    56    9.81
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.18
  TOTAL AREA(ACRES) =      0.41   PEAK FLOW RATE(CFS) =      1.18

****************************************************************************
  FLOW PROCESS FROM NODE     74.00 TO NODE     74.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.81
  RAINFALL INTENSITY(INCH/HR) =   3.29
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.41
  TOTAL STREAM AREA(ACRES) =       0.41
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.18

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       68.10    9.65    3.325  0.30( 0.08) 0.25      18.8      78.00
      1       68.85    9.91    3.275  0.30( 0.08) 0.25      19.3      65.00
      1       71.01   10.60    3.152  0.30( 0.08) 0.25      20.9      75.00
      1       71.48   10.76    3.126  0.30( 0.08) 0.25      21.2      72.00
      1       72.94   11.28    3.044  0.30( 0.08) 0.25      22.3      51.00
```

1	73.50	11.46	3.016	0.30(0.08)	0.25	22.8	58.00
1	73.74	11.55	3.004	0.30(0.08)	0.25	23.0	71.00
1	73.99	11.62	2.993	0.30(0.08)	0.25	23.2	43.00
1	74.15	11.69	2.983	0.30(0.08)	0.25	23.3	55.00
1	74.39	11.79	2.969	0.30(0.08)	0.25	23.6	45.00
1	74.47	11.83	2.963	0.30(0.08)	0.25	23.7	59.00
1	74.69	11.94	2.947	0.30(0.08)	0.25	23.9	77.00
1	75.01	12.11	2.924	0.30(0.08)	0.25	24.2	63.00
1	75.12	12.17	2.915	0.30(0.08)	0.25	24.4	30.00
1	75.54	12.49	2.873	0.30(0.08)	0.25	25.0	60.00
1	75.71	12.62	2.856	0.30(0.07)	0.25	25.2	38.00
1	75.89	12.76	2.838	0.30(0.07)	0.25	25.5	68.00
1	76.16	13.02	2.807	0.30(0.07)	0.25	25.9	30.00
1	76.26	13.13	2.793	0.30(0.07)	0.25	26.1	36.00
1	76.81	13.85	2.710	0.30(0.07)	0.24	27.3	14.00
1	77.03	14.14	2.678	0.30(0.07)	0.24	27.8	26.00
1	77.06	14.18	2.674	0.30(0.07)	0.24	27.9	27.00
1	77.10	14.24	2.667	0.30(0.07)	0.24	28.0	38.00
1	77.35	14.79	2.611	0.30(0.07)	0.24	28.9	72.00
1	77.38	14.90	2.600	0.30(0.07)	0.24	29.0	20.00
1	77.36	15.35	2.556	0.30(0.07)	0.24	29.7	17.00
1	77.36	15.36	2.556	0.30(0.07)	0.24	29.7	23.00
1	77.35	15.41	2.551	0.30(0.07)	0.24	29.7	29.00
1	77.04	16.27	2.474	0.30(0.07)	0.24	30.8	50.00
1	76.47	16.71	2.437	0.30(0.07)	0.24	31.1	39.00
1	76.42	16.74	2.434	0.30(0.07)	0.24	31.1	34.00
1	75.80	17.08	2.406	0.30(0.07)	0.24	31.3	24.00
1	70.66	20.24	2.186	0.30(0.07)	0.23	32.8	12.00
1	67.05	22.85	2.041	0.30(0.07)	0.23	33.8	64.00
1	65.90	23.72	1.998	0.30(0.07)	0.23	34.1	32.00
1	65.76	23.79	1.995	0.30(0.07)	0.23	34.1	10.00
2	1.18	9.81	3.295	0.30(0.11)	0.35	0.4	59.00

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	69.26	9.65	3.325	0.30(0.08)	0.25	19.2	78.00
2	69.72	9.81	3.295	0.30(0.08)	0.25	19.5	59.00
3	70.02	9.91	3.275	0.30(0.08)	0.25	19.8	65.00
4	72.13	10.60	3.152	0.30(0.08)	0.25	21.3	75.00
5	72.59	10.76	3.126	0.30(0.08)	0.25	21.6	72.00
6	74.03	11.28	3.044	0.30(0.08)	0.25	22.7	51.00
7	74.57	11.46	3.016	0.30(0.08)	0.25	23.2	58.00
8	74.81	11.55	3.004	0.30(0.08)	0.25	23.4	71.00
9	75.06	11.62	2.993	0.30(0.08)	0.25	23.6	43.00
10	75.21	11.69	2.983	0.30(0.08)	0.25	23.8	55.00
11	75.44	11.79	2.969	0.30(0.08)	0.25	24.0	45.00
12	75.52	11.83	2.963	0.30(0.08)	0.25	24.1	59.00
13	75.74	11.94	2.947	0.30(0.08)	0.25	24.3	77.00
14	76.05	12.11	2.924	0.30(0.08)	0.25	24.6	63.00
15	76.15	12.17	2.915	0.30(0.08)	0.25	24.8	30.00

16	76.56	12.49	2.873	0.30(0.08)	0.25	25.4	60.00
17	76.73	12.62	2.856	0.30(0.08)	0.25	25.6	38.00
18	76.90	12.76	2.838	0.30(0.08)	0.25	25.9	68.00
19	77.16	13.02	2.807	0.30(0.08)	0.25	26.3	30.00
20	77.25	13.13	2.793	0.30(0.08)	0.25	26.5	36.00
21	77.77	13.85	2.710	0.30(0.07)	0.25	27.7	14.00
22	77.98	14.14	2.678	0.30(0.07)	0.24	28.2	26.00
23	78.01	14.18	2.674	0.30(0.07)	0.24	28.3	27.00
24	78.04	14.24	2.667	0.30(0.07)	0.24	28.4	38.00
25	78.28	14.79	2.611	0.30(0.07)	0.24	29.3	72.00
26	78.30	14.90	2.600	0.30(0.07)	0.24	29.4	20.00
27	78.27	15.35	2.556	0.30(0.07)	0.24	30.1	17.00
28	78.27	15.36	2.556	0.30(0.07)	0.24	30.1	23.00
29	78.25	15.41	2.551	0.30(0.07)	0.24	30.2	29.00
30	77.92	16.27	2.474	0.30(0.07)	0.24	31.2	50.00
31	77.33	16.71	2.437	0.30(0.07)	0.24	31.5	39.00
32	77.28	16.74	2.434	0.30(0.07)	0.24	31.5	34.00
33	76.65	17.08	2.406	0.30(0.07)	0.24	31.7	24.00
34	71.43	20.24	2.186	0.30(0.07)	0.23	33.2	12.00
35	67.77	22.85	2.041	0.30(0.07)	0.23	34.2	64.00
36	66.60	23.72	1.998	0.30(0.07)	0.23	34.5	32.00
37	66.45	23.79	1.995	0.30(0.07)	0.23	34.5	10.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 78.30 Tc(MIN.) = 14.90
EFFECTIVE AREA(ACRES) = 29.43 AREA-AVERAGED Fm(INCH/HR) = 0.07
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.24
TOTAL AREA(ACRES) = 34.5
LONGEST FLOWPATH FROM NODE 10.00 TO NODE 74.00 = 2940.00 FEET.

****
FLOW PROCESS FROM NODE 80.00 TO NODE 81.00 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==
INITIAL SUBAREA FLOW-LENGTH(FEET) = 290.00
ELEVATION DATA: UPSTREAM(FEET) = 166.40 DOWNSTREAM(FEET) = 165.90

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.484
* 25 YEAR RAINFALL INTENSITY(INCH/HR) = 3.172
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	B	0.76	0.30	0.100	56	10.48

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA RUNOFF(CFS) = 2.15
TOTAL AREA(ACRES) = 0.76 PEAK FLOW RATE(CFS) = 2.15

****
FLOW PROCESS FROM NODE 81.00 TO NODE 82.00 IS CODE = 31

```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   153.00  DOWNSTREAM(FEET) =   147.60
  FLOW LENGTH(FEET) =   320.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   5.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.67
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.15
  PIPE TRAVEL TIME(MIN.) =   0.94    Tc(MIN.) =   11.42
  LONGEST FLOWPATH FROM NODE     80.00 TO NODE     82.00 =     610.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     82.00 TO NODE     82.00 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.) =   11.42
  RAINFALL INTENSITY(INCH/HR) =   3.02
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       0.76
  TOTAL STREAM AREA(ACRES) =       0.76
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.15

****************************************************************************
  FLOW PROCESS FROM NODE     81.00 TO NODE     82.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   320.00
  ELEVATION DATA: UPSTREAM(FEET) =    165.90  DOWNSTREAM(FEET) =    165.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.122
  *  25 YEAR RAINFALL INTENSITY(INCH/HR) =  3.068
  SUBAREA Tc 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        0.59      0.30      0.100    56   11.12
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      1.61
  TOTAL AREA(ACRES) =      0.59   PEAK FLOW RATE(CFS) =      1.61

****************************************************************************
  FLOW PROCESS FROM NODE     82.00 TO NODE     82.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
```

```
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.12
  RAINFALL INTENSITY(INCH/HR) =   3.07
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       0.59
  TOTAL STREAM AREA(ACRES) =       0.59
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.61

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        2.15   11.42    3.022  0.30( 0.03) 0.10       0.8      80.00
      2        1.61   11.12    3.068  0.30( 0.03) 0.10       0.6      81.00

  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        3.74   11.12    3.068  0.30( 0.03) 0.10       1.3      81.00
      2        3.74   11.42    3.022  0.30( 0.03) 0.10       1.3      80.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       3.74    Tc(MIN.) =    11.42
  EFFECTIVE AREA(ACRES) =       1.35   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        1.3
  LONGEST FLOWPATH FROM NODE     80.00 TO NODE     82.00 =     610.00 FEET.
==============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        1.3  TC(MIN.) =     11.42
  EFFECTIVE AREA(ACRES) =      1.35  AREA-AVERAGED Fm(INCH/HR)=  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.100
  PEAK FLOW RATE(CFS)   =       3.74

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        3.74   11.12    3.068  0.30( 0.03) 0.10       1.3      81.00
      2        3.74   11.42    3.022  0.30( 0.03) 0.10       1.3      80.00
==============================================================================
==============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
**************************************************************************
            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          (Reference: 1986 ORANGE COUNTY HYDROLOGY CRITERION)
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            Ver. 20.0  Release Date: 06/01/2013  License ID 1654

                          Analysis prepared by:

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                             Irvine, CA 92606
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```

```
 ************************** DESCRIPTION OF STUDY **************************
* FREEMAN                                                                *
* PROPOSED CONDITION                                                     *
* 100 YEAR ANALYSIS                                                      *
 ************************************************************************

  FILE NAME: FRPR100.DAT
  TIME/DATE OF STUDY: 09:23 05/29/2017
==========================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
==========================================================================
                    --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   24.0     19.0    0.020/0.020/0.020   0.67    2.00 0.0313 0.167 0.0150
  2   18.0     13.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.50 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     10.00 TO NODE     32.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   265.00
 ELEVATION DATA: UPSTREAM(FEET) =    167.50  DOWNSTREAM(FEET) =    166.30

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.337
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.616
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 COMMERCIAL                 B        0.15      0.30     0.100    76    8.34
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA RUNOFF(CFS) =      0.62
 TOTAL AREA(ACRES) =      0.15   PEAK FLOW RATE(CFS) =      0.62

****************************************************************************
 FLOW PROCESS FROM NODE     32.00 TO NODE     11.00 IS CODE =  61
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STANDARD CURB SECTION USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  166.30  DOWNSTREAM ELEVATION(FEET) =  165.10
 STREET LENGTH(FEET) =   210.00   CURB HEIGHT(INCHES) =  6.0
 STREET HALFWIDTH(FEET) = 25.00

 DISTANCE FROM CROWN 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) =       0.83
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.26
   HALFSTREET FLOOD WIDTH(FEET) =    6.85
   AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.42
   PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.37
 STREET FLOW TRAVEL TIME(MIN.) =   2.47   Tc(MIN.) =   10.81
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.978
 SUBAREA LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
 COMMERCIAL                 B        0.12      0.30     0.100    76
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
 SUBAREA AREA(ACRES) =    0.12      SUBAREA RUNOFF(CFS) =    0.43
```

```
  EFFECTIVE AREA(ACRES) =      0.27    AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        0.3        PEAK FLOW RATE(CFS) =       0.96

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.27   HALFSTREET FLOOD WIDTH(FEET) =   7.33
  FLOW VELOCITY(FEET/SEC.) =  1.46   DEPTH*VELOCITY(FT*FT/SEC.) =   0.40
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     11.00 =     475.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     11.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.81
  RAINFALL INTENSITY(INCH/HR) =   3.98
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       0.27
  TOTAL STREAM AREA(ACRES) =       0.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.96

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE     11.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   210.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.00  DOWNSTREAM(FEET) =    165.10

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.680
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.838
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        0.76      0.30      0.100    76    7.68
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      3.29
  TOTAL AREA(ACRES) =      0.76   PEAK FLOW RATE(CFS) =      3.29

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     11.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
```

```
 TIME OF CONCENTRATION(MIN.) =    7.68
 RAINFALL INTENSITY(INCH/HR) =   4.84
 AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       0.76
 TOTAL STREAM AREA(ACRES) =       0.76
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       3.29

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
     1        0.96   10.81    3.978  0.30( 0.03) 0.10       0.3      10.00
     2        3.29    7.68    4.838  0.30( 0.03) 0.10       0.8      12.00

 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        4.12    7.68    4.838  0.30( 0.03) 0.10       1.0      12.00
     2        3.66   10.81    3.978  0.30( 0.03) 0.10       1.0      10.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       4.12    Tc(MIN.) =     7.68
 EFFECTIVE AREA(ACRES) =       0.95   AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =        1.0
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     11.00 =     475.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     11.00 TO NODE     13.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) =  165.10  DOWNSTREAM ELEVATION(FEET) =  164.20
 STREET LENGTH(FEET) =   455.00   CURB HEIGHT(INCHES) =  8.0
 STREET HALFWIDTH(FEET) = 24.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  19.00
 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) =       4.69
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
   STREET FLOW DEPTH(FEET) =  0.51
   HALFSTREET FLOOD WIDTH(FEET) =   17.65
```

```
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.42
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.73
  STREET FLOW TRAVEL TIME(MIN.) =   5.34   Tc(MIN.) =   13.02
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.575
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        0.36      0.30     0.100    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.36      SUBAREA RUNOFF(CFS) =    1.15
  EFFECTIVE AREA(ACRES) =      1.31    AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        1.4        PEAK FLOW RATE(CFS) =       4.19

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.50   HALFSTREET FLOOD WIDTH(FEET) =  16.91
  FLOW VELOCITY(FEET/SEC.) =  1.37   DEPTH*VELOCITY(FT*FT/SEC.) =   0.68
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     13.00 =     930.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.02
  RAINFALL INTENSITY(INCH/HR) =   3.58
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       1.31
  TOTAL STREAM AREA(ACRES) =       1.39
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       4.19

****************************************************************************
  FLOW PROCESS FROM NODE     14.00 TO NODE     15.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   125.00
  ELEVATION DATA: UPSTREAM(FEET) =    164.60  DOWNSTREAM(FEET) =    164.20

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    6.616
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.270
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        0.15      0.30     0.100    76    6.62
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
```

```
  SUBAREA RUNOFF(CFS) =      0.71
  TOTAL AREA(ACRES) =      0.15   PEAK FLOW RATE(CFS) =      0.71

****************************************************************************
  FLOW PROCESS FROM NODE     15.00 TO NODE     13.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   159.30  DOWNSTREAM(FEET) =   159.20
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   4.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   1.88
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.71
  PIPE TRAVEL TIME(MIN.) =   0.44    Tc(MIN.) =    7.06
  LONGEST FLOWPATH FROM NODE     14.00 TO NODE     13.00 =     175.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.06
  RAINFALL INTENSITY(INCH/HR) =   5.08
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       0.15
  TOTAL STREAM AREA(ACRES) =       0.15
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.71

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        4.19   13.02    3.575  0.30( 0.03) 0.10       1.3      12.00
      1        3.89   16.31    3.142  0.30( 0.03) 0.10       1.4      10.00
      2        0.71    7.06    5.077  0.30( 0.03) 0.10       0.2      14.00

  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        3.94    7.06    5.077  0.30( 0.03) 0.10       0.9      14.00
      2        4.68   13.02    3.575  0.30( 0.03) 0.10       1.5      12.00
      3        4.33   16.31    3.142  0.30( 0.03) 0.10       1.5      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       4.68    Tc(MIN.) =    13.02
```

```
  EFFECTIVE AREA(ACRES) =       1.46   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        1.5
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     13.00 =     930.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     16.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   159.20  DOWNSTREAM(FEET) =   151.55
  FLOW LENGTH(FEET) =   235.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   6.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.73
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.68
  PIPE TRAVEL TIME(MIN.) =   0.45    Tc(MIN.) =   13.47
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     16.00 =    1165.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     17.00 TO NODE     18.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   150.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.90  DOWNSTREAM(FEET) =    166.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.741
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.493
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.36      0.30     0.350    76    8.74
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.42
  TOTAL AREA(ACRES) =      0.36   PEAK FLOW RATE(CFS) =      1.42

****************************************************************************
  FLOW PROCESS FROM NODE     18.00 TO NODE     19.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   153.00  DOWNSTREAM(FEET) =   151.60
```

```
  FLOW LENGTH(FEET) =    65.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   4.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.56
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.42
  PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =    8.94
  LONGEST FLOWPATH FROM NODE     17.00 TO NODE     19.00 =     215.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     19.00 TO NODE     19.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.94
  RAINFALL INTENSITY(INCH/HR) =   4.44
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.36
  TOTAL STREAM AREA(ACRES) =       0.36
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.42

****************************************************************************
  FLOW PROCESS FROM NODE     20.00 TO NODE     21.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   150.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.30  DOWNSTREAM(FEET) =    166.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.359
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.609
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               A        0.50      0.40      0.350    52    8.36
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      2.01
  TOTAL AREA(ACRES) =      0.50   PEAK FLOW RATE(CFS) =      2.01

****************************************************************************
  FLOW PROCESS FROM NODE     21.00 TO NODE     19.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   153.00  DOWNSTREAM(FEET) =   151.60
  FLOW LENGTH(FEET) =    45.00   MANNING'S N =  0.013
```

```
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   4.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.99
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.01
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =    8.47
  LONGEST FLOWPATH FROM NODE     20.00 TO NODE     19.00 =     195.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     19.00 TO NODE     19.00 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.) =    8.47
  RAINFALL INTENSITY(INCH/HR) =   4.58
  AREA-AVERAGED Fm(INCH/HR) =  0.14
  AREA-AVERAGED Fp(INCH/HR) =  0.40
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.50
  TOTAL STREAM AREA(ACRES) =       0.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.01

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        1.42    8.94    4.436  0.30( 0.11) 0.35       0.4      17.00
      2        2.01    8.47    4.575  0.40( 0.14) 0.35       0.5      20.00

  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        3.40    8.47    4.575  0.36( 0.13) 0.35       0.8      20.00
      2        3.37    8.94    4.436  0.36( 0.13) 0.35       0.9      17.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       3.40    Tc(MIN.) =     8.47
  EFFECTIVE AREA(ACRES) =       0.84   AREA-AVERAGED Fm(INCH/HR) =  0.13
  AREA-AVERAGED Fp(INCH/HR) =  0.36  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        0.9
  LONGEST FLOWPATH FROM NODE     17.00 TO NODE     19.00 =     215.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     19.00 TO NODE     19.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    8.47
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.575
```

```
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  CONDOMINIUMS               B        0.42      0.30     0.350    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA AREA(ACRES) =    0.42      SUBAREA RUNOFF(CFS) =    1.69
  EFFECTIVE AREA(ACRES) =      1.26   AREA-AVERAGED Fm(INCH/HR) =  0.12
  AREA-AVERAGED Fp(INCH/HR) =  0.34  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        1.3       PEAK FLOW RATE(CFS) =       5.06

****************************************************************************
  FLOW PROCESS FROM NODE     19.00 TO NODE     16.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   151.60  DOWNSTREAM(FEET) =   151.55
  FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.013
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.86
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.06
  PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =    8.64
  LONGEST FLOWPATH FROM NODE     17.00 TO NODE     16.00 =     245.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 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        5.06    8.64    4.522  0.34( 0.12) 0.35       1.3      20.00
      2        4.97    9.11    4.387  0.34( 0.12) 0.35       1.3      17.00
  LONGEST FLOWPATH FROM NODE     17.00 TO NODE     16.00 =     245.00 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        3.94    7.53    4.893  0.30( 0.03) 0.10       0.9      14.00
      2        4.68   13.47    3.507  0.30( 0.03) 0.10       1.5      12.00
      3        4.33   16.77    3.092  0.30( 0.03) 0.10       1.5      10.00
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     16.00 =    1165.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        8.72    7.53    4.893  0.33( 0.08) 0.24       2.0      14.00
      2        9.14    8.64    4.522  0.33( 0.08) 0.24       2.2      20.00
      3        9.11    9.11    4.387  0.33( 0.08) 0.24       2.3      17.00
```

```
      4        8.63   13.47    3.507  0.33( 0.07) 0.22       2.7      12.00
      5        7.79   16.77    3.092  0.33( 0.07) 0.21       2.8      10.00
    TOTAL AREA(ACRES) =         2.8

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =        9.14  Tc(MIN.) =    8.641
  EFFECTIVE AREA(ACRES) =      2.23  AREA-AVERAGED Fm(INCH/HR) =  0.08
  AREA-AVERAGED Fp(INCH/HR) =  0.33  AREA-AVERAGED Ap =  0.24
  TOTAL AREA(ACRES) =        2.8
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     16.00 =    1165.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     22.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   151.55  DOWNSTREAM(FEET) =   151.30
  FLOW LENGTH(FEET) =   115.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  17.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.70
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.14
  PIPE TRAVEL TIME(MIN.) =   0.52    Tc(MIN.) =    9.16
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     22.00 =    1280.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     22.00 TO NODE     22.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    9.16
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.374
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  CONDOMINIUMS               A        0.31      0.40     0.350    52
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.40
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA AREA(ACRES) =    0.31      SUBAREA RUNOFF(CFS) =    1.18
  EFFECTIVE AREA(ACRES) =      2.54   AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.34  AREA-AVERAGED Ap =  0.25
  TOTAL AREA(ACRES) =        3.1       PEAK FLOW RATE(CFS) =       9.82

****************************************************************************
  FLOW PROCESS FROM NODE     22.00 TO NODE     22.00 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.) =    9.16
  RAINFALL INTENSITY(INCH/HR) =   4.37
  AREA-AVERAGED Fm(INCH/HR) =  0.09
```

```
 AREA-AVERAGED Fp(INCH/HR) =  0.34
 AREA-AVERAGED Ap =  0.25
 EFFECTIVE STREAM AREA(ACRES) =       2.54
 TOTAL STREAM AREA(ACRES) =       3.13
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       9.82

****************************************************************************
 FLOW PROCESS FROM NODE     23.00 TO NODE     22.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   225.00
 ELEVATION DATA: UPSTREAM(FEET) =    166.30  DOWNSTREAM(FEET) =    165.50

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.705
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.231
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 CONDOMINIUMS               B        0.71      0.30     0.350    76    9.70
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
 SUBAREA RUNOFF(CFS) =      2.64
 TOTAL AREA(ACRES) =      0.71   PEAK FLOW RATE(CFS) =      2.64

****************************************************************************
 FLOW PROCESS FROM NODE     22.00 TO NODE     22.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.70
 RAINFALL INTENSITY(INCH/HR) =   4.23
 AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.35
 EFFECTIVE STREAM AREA(ACRES) =       0.71
 TOTAL STREAM AREA(ACRES) =       0.71
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.64

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)    NODE
     1        9.44    8.05    4.709  0.35( 0.09) 0.26       2.3      14.00
     1        9.82    9.16    4.374  0.34( 0.09) 0.25       2.5      20.00
     1        9.78    9.63    4.250  0.34( 0.09) 0.25       2.6      17.00
     1        9.21   13.99    3.431  0.34( 0.08) 0.23       3.1      12.00
     1        8.34   17.31    3.038  0.34( 0.08) 0.23       3.1      10.00
     2        2.64    9.70    4.231  0.30( 0.11) 0.35       0.7      23.00
```

```
  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       11.88    8.05    4.709  0.33( 0.09) 0.27       2.9      14.00
      2       12.39    9.16    4.374  0.33( 0.09) 0.27       3.2      20.00
      3       12.41    9.63    4.250  0.33( 0.09) 0.27       3.3      17.00
      4       12.41    9.70    4.231  0.33( 0.09) 0.27       3.3      23.00
      5       11.33   13.99    3.431  0.33( 0.08) 0.25       3.8      12.00
      6       10.21   17.31    3.038  0.33( 0.08) 0.25       3.8      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      12.41    Tc(MIN.) =     9.63
  EFFECTIVE AREA(ACRES) =       3.32   AREA-AVERAGED Fm(INCH/HR) =  0.09
  AREA-AVERAGED Fp(INCH/HR) =  0.33  AREA-AVERAGED Ap =  0.27
  TOTAL AREA(ACRES) =        3.8
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     22.00 =    1280.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     22.00 TO NODE     22.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     24.00 TO NODE     25.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   270.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.354
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.077
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.51      0.30     0.350    76   10.35
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.82
  TOTAL AREA(ACRES) =      0.51   PEAK FLOW RATE(CFS) =      1.82

****************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE     25.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
```

```
  TIME OF CONCENTRATION(MIN.) =   10.35
  RAINFALL INTENSITY(INCH/HR) =   4.08
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.51
  TOTAL STREAM AREA(ACRES) =       0.51
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.82

****************************************************************************
  FLOW PROCESS FROM NODE     26.00 TO NODE     25.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   155.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.422
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.934
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.30      0.30      0.350    76    7.42
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.30
  TOTAL AREA(ACRES) =      0.30   PEAK FLOW RATE(CFS) =      1.30

****************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE     25.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.42
  RAINFALL INTENSITY(INCH/HR) =   4.93
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.30
  TOTAL STREAM AREA(ACRES) =       0.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.30

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        1.82   10.35    4.077  0.30( 0.11) 0.35       0.5      24.00
      2        1.30    7.42    4.934  0.30( 0.10) 0.35       0.3      26.00

  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        2.89    7.42    4.934  0.30( 0.10) 0.35       0.7      26.00
      2        2.90   10.35    4.077  0.30( 0.11) 0.35       0.8      24.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       2.90    Tc(MIN.) =    10.35
  EFFECTIVE AREA(ACRES) =       0.81   AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        0.8
  LONGEST FLOWPATH FROM NODE     24.00 TO NODE     25.00 =     270.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE     28.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   161.00  DOWNSTREAM(FEET) =   158.00
  FLOW LENGTH(FEET) =   175.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.13
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.90
  PIPE TRAVEL TIME(MIN.) =   0.48    Tc(MIN.) =   10.83
  LONGEST FLOWPATH FROM NODE     24.00 TO NODE     28.00 =     445.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     28.00 TO NODE     28.00 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.) =   10.83
  RAINFALL INTENSITY(INCH/HR) =   3.97
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.81
  TOTAL STREAM AREA(ACRES) =       0.81
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.90

****************************************************************************
  FLOW PROCESS FROM NODE     27.00 TO NODE     28.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   180.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.40
```

```
  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.965
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.738
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.18      0.30     0.350    76    7.97
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.75
  TOTAL AREA(ACRES) =      0.18   PEAK FLOW RATE(CFS) =      0.75

****************************************************************************
  FLOW PROCESS FROM NODE     28.00 TO NODE     28.00 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.) =    7.97
  RAINFALL INTENSITY(INCH/HR) =   4.74
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.18
  TOTAL STREAM AREA(ACRES) =       0.18
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.75

****************************************************************************
  FLOW PROCESS FROM NODE     29.00 TO NODE     28.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   230.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.227
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.355
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.48      0.30     0.350    76    9.23
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.84
  TOTAL AREA(ACRES) =      0.48   PEAK FLOW RATE(CFS) =      1.84

****************************************************************************
  FLOW PROCESS FROM NODE     28.00 TO NODE     28.00 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.) =    9.23
  RAINFALL INTENSITY(INCH/HR) =   4.36
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.48
  TOTAL STREAM AREA(ACRES) =       0.48
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.84

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        2.89    7.90    4.762  0.30( 0.10) 0.35       0.7      26.00
      1        2.90   10.83    3.973  0.30( 0.11) 0.35       0.8      24.00
      2        0.75    7.97    4.738  0.30( 0.11) 0.35       0.2      27.00
      3        1.84    9.23    4.355  0.30( 0.11) 0.35       0.5      29.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        5.36    7.90    4.762  0.30( 0.10) 0.35       1.3      26.00
      2        5.37    7.97    4.738  0.30( 0.10) 0.35       1.3      27.00
      3        5.43    9.23    4.355  0.30( 0.11) 0.35       1.4      29.00
      4        5.19   10.83    3.973  0.30( 0.11) 0.35       1.5      24.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       5.43    Tc(MIN.) =     9.23
  EFFECTIVE AREA(ACRES) =       1.39   AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        1.5
  LONGEST FLOWPATH FROM NODE     24.00 TO NODE     28.00 =     445.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     28.00 TO NODE     22.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   158.00  DOWNSTREAM(FEET) =   151.30
  FLOW LENGTH(FEET) =   250.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   9.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.24
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.43
  PIPE TRAVEL TIME(MIN.) =   0.51    Tc(MIN.) =    9.73
  LONGEST FLOWPATH FROM NODE     24.00 TO NODE     22.00 =     695.00 FEET.
```

```
****************************************************************************
 FLOW PROCESS FROM NODE     22.00 TO NODE     22.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        5.36    8.40    4.595  0.30( 0.10) 0.35       1.3      26.00
     2        5.37    8.47    4.574  0.30( 0.10) 0.35       1.3      27.00
     3        5.43    9.73    4.224  0.30( 0.11) 0.35       1.4      29.00
     4        5.19   11.34    3.871  0.30( 0.11) 0.35       1.5      24.00
 LONGEST FLOWPATH FROM NODE     24.00 TO NODE     22.00 =     695.00 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       11.88    8.05    4.709  0.33( 0.09) 0.27       2.9      14.00
     2       12.39    9.16    4.374  0.33( 0.09) 0.27       3.2      20.00
     3       12.41    9.63    4.250  0.33( 0.09) 0.27       3.3      17.00
     4       12.41    9.70    4.231  0.33( 0.09) 0.27       3.3      23.00
     5       11.33   13.99    3.431  0.33( 0.08) 0.25       3.8      12.00
     6       10.21   17.31    3.038  0.33( 0.08) 0.25       3.8      10.00
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     22.00 =    1280.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       17.15    8.05    4.709  0.32( 0.10) 0.30       4.1      14.00
     2       17.41    8.40    4.595  0.32( 0.10) 0.30       4.2      26.00
     3       17.45    8.47    4.574  0.32( 0.10) 0.30       4.3      27.00
     4       17.79    9.16    4.374  0.32( 0.10) 0.30       4.5      20.00
     5       17.83    9.63    4.250  0.32( 0.09) 0.30       4.7      17.00
     6       17.84    9.70    4.231  0.32( 0.09) 0.30       4.7      23.00
     7       17.83    9.73    4.224  0.32( 0.09) 0.30       4.7      29.00
     8       17.19   11.34    3.871  0.32( 0.09) 0.29       5.0      24.00
     9       15.92   13.99    3.431  0.32( 0.09) 0.28       5.2      12.00
    10       14.26   17.31    3.038  0.32( 0.09) 0.28       5.3      10.00
   TOTAL AREA(ACRES) =         5.3

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       17.84  Tc(MIN.) =    9.705
 EFFECTIVE AREA(ACRES) =      4.72  AREA-AVERAGED Fm(INCH/HR) =  0.09
 AREA-AVERAGED Fp(INCH/HR) =  0.32  AREA-AVERAGED Ap =  0.29
 TOTAL AREA(ACRES) =        5.3
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     22.00 =    1280.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     22.00 TO NODE     33.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =   151.30  DOWNSTREAM(FEET) =   150.50
  FLOW LENGTH(FEET) =   425.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  22.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.18
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      17.84
  PIPE TRAVEL TIME(MIN.) =   1.69    Tc(MIN.) =   11.40
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     33.00 =    1705.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE     31.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   150.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.50

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.277
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.990
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.29      0.30     0.350    76    7.28
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.28
  TOTAL AREA(ACRES) =      0.29   PEAK FLOW RATE(CFS) =      1.28

****************************************************************************
  FLOW PROCESS FROM NODE     31.00 TO NODE     31.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =    7.28
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.990
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  CONDOMINIUMS               B        0.65      0.30     0.350    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA AREA(ACRES) =    0.65      SUBAREA RUNOFF(CFS) =    2.86
  EFFECTIVE AREA(ACRES) =      0.94   AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        0.9       PEAK FLOW RATE(CFS) =       4.13
```

```
****************************************************************************
 FLOW PROCESS FROM NODE     31.00 TO NODE     33.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   157.00  DOWNSTREAM(FEET) =   150.50
 FLOW LENGTH(FEET) =   380.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   9.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.55
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       4.13
 PIPE TRAVEL TIME(MIN.) =   0.97    Tc(MIN.) =    8.24
 LONGEST FLOWPATH FROM NODE     30.00 TO NODE     33.00 =     530.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 3 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        4.13    8.24    4.646  0.30( 0.11) 0.35       0.9      30.00
 LONGEST FLOWPATH FROM NODE     30.00 TO NODE     33.00 =     530.00 FEET.

 ** MEMORY BANK #  3 CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       17.15    9.81    4.205  0.32( 0.10) 0.30       4.1      14.00
     2       17.41   10.11    4.134  0.32( 0.10) 0.30       4.2      26.00
     3       17.45   10.17    4.119  0.32( 0.10) 0.30       4.3      27.00
     4       17.79   10.85    3.968  0.32( 0.10) 0.30       4.5      20.00
     5       17.83   11.33    3.873  0.32( 0.09) 0.30       4.7      17.00
     6       17.84   11.40    3.859  0.32( 0.09) 0.30       4.7      23.00
     7       17.83   11.43    3.853  0.32( 0.09) 0.30       4.7      29.00
     8       17.19   13.10    3.564  0.32( 0.09) 0.29       5.0      24.00
     9       15.92   15.76    3.205  0.32( 0.09) 0.28       5.2      12.00
    10       14.26   19.10    2.870  0.32( 0.09) 0.28       5.3      10.00
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     33.00 =    1705.00 FEET.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       20.09    8.24    4.646  0.32( 0.10) 0.31       4.4      30.00
     2       20.88    9.81    4.205  0.32( 0.10) 0.31       5.0      14.00
     3       21.07   10.11    4.134  0.32( 0.10) 0.31       5.2      26.00
     4       21.10   10.17    4.119  0.32( 0.10) 0.31       5.2      27.00
     5       21.31   10.85    3.968  0.32( 0.10) 0.31       5.5      20.00
     6       21.26   11.33    3.873  0.32( 0.10) 0.30       5.6      17.00
     7       21.25   11.40    3.859  0.32( 0.10) 0.30       5.7      23.00
     8       21.24   11.43    3.853  0.32( 0.10) 0.30       5.7      29.00
     9       20.34   13.10    3.564  0.32( 0.09) 0.30       5.9      24.00
```

```
     10       18.74   15.76    3.205  0.32( 0.09) 0.29       6.2      12.00
     11       16.77   19.10    2.870  0.32( 0.09) 0.29       6.2      10.00
    TOTAL AREA(ACRES) =         6.2

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       21.31  Tc(MIN.) =   10.855
  EFFECTIVE AREA(ACRES) =      5.49  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.32  AREA-AVERAGED Ap =  0.31
  TOTAL AREA(ACRES) =        6.2
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     33.00 =    1705.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     22.00 TO NODE     22.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  5
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.85
  RAINFALL INTENSITY(INCH/HR) =   3.97
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.32
  AREA-AVERAGED Ap =  0.31
  EFFECTIVE STREAM AREA(ACRES) =       5.49
  TOTAL STREAM AREA(ACRES) =       6.25
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      21.31

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE     33.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   185.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.60  DOWNSTREAM(FEET) =    166.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.141
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.379
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
```

```
  CONDOMINIUMS                B        0.67      0.30     0.350    76    9.14
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      2.58
  TOTAL AREA(ACRES) =      0.67   PEAK FLOW RATE(CFS) =      2.58

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  5
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.14
  RAINFALL INTENSITY(INCH/HR) =   4.38
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.67
  TOTAL STREAM AREA(ACRES) =       0.67
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.58

****************************************************************************
  FLOW PROCESS FROM NODE     34.00 TO NODE     35.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   180.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.20  DOWNSTREAM(FEET) =    166.10

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   12.867
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.600
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS                B        0.50      0.30     0.350    76   12.87
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.57
  TOTAL AREA(ACRES) =      0.50   PEAK FLOW RATE(CFS) =      1.57

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  5
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.87
  RAINFALL INTENSITY(INCH/HR) =   3.60
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
```

```
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.50
  TOTAL STREAM AREA(ACRES) =       0.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.57

****************************************************************************
  FLOW PROCESS FROM NODE     36.00 TO NODE     37.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   150.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.70  DOWNSTREAM(FEET) =    166.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.258
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.347
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.29      0.30     0.350    76    9.26
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.11
  TOTAL AREA(ACRES) =      0.29   PEAK FLOW RATE(CFS) =      1.11

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  5
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  4 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.26
  RAINFALL INTENSITY(INCH/HR) =   4.35
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.29
  TOTAL STREAM AREA(ACRES) =       0.29
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.11

****************************************************************************
  FLOW PROCESS FROM NODE     38.00 TO NODE     33.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   150.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.40  DOWNSTREAM(FEET) =    166.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.741
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.493
```

SUBAREA Tc AND LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
CONDOMINIUMS	B	0.18	0.30	0.350	76	8.74

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.350
SUBAREA RUNOFF(CFS) = 0.71
TOTAL AREA(ACRES) = 0.18 PEAK FLOW RATE(CFS) = 0.71

****
FLOW PROCESS FROM NODE 33.00 TO NODE 33.00 IS CODE = 1

>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==========
TOTAL NUMBER OF STREAMS = 5
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 5 ARE:
TIME OF CONCENTRATION(MIN.) = 8.74
RAINFALL INTENSITY(INCH/HR) = 4.49
AREA-AVERAGED Fm(INCH/HR) = 0.11
AREA-AVERAGED Fp(INCH/HR) = 0.30
AREA-AVERAGED Ap = 0.35
EFFECTIVE STREAM AREA(ACRES) = 0.18
TOTAL STREAM AREA(ACRES) = 0.18
PEAK FLOW RATE(CFS) AT CONFLUENCE = 0.71

** CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	20.09	8.24	4.646	0.32(0.10)	0.31	4.4	30.00
1	20.88	9.81	4.205	0.32(0.10)	0.31	5.0	14.00
1	21.07	10.11	4.134	0.32(0.10)	0.31	5.2	26.00
1	21.10	10.17	4.119	0.32(0.10)	0.31	5.2	27.00
1	21.31	10.85	3.968	0.32(0.10)	0.31	5.5	20.00
1	21.26	11.33	3.873	0.32(0.10)	0.30	5.6	17.00
1	21.25	11.40	3.859	0.32(0.10)	0.30	5.7	23.00
1	21.24	11.43	3.853	0.32(0.10)	0.30	5.7	29.00
1	20.34	13.10	3.564	0.32(0.09)	0.30	5.9	24.00
1	18.74	15.76	3.205	0.32(0.09)	0.29	6.2	12.00
1	16.77	19.10	2.870	0.32(0.09)	0.29	6.2	10.00
2	2.58	9.14	4.379	0.30(0.11)	0.35	0.7	30.00
3	1.57	12.87	3.600	0.30(0.11)	0.35	0.5	34.00
4	1.11	9.26	4.347	0.30(0.11)	0.35	0.3	36.00
5	0.71	8.74	4.493	0.30(0.11)	0.35	0.2	38.00

RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
CONFLUENCE FORMULA USED FOR 5 STREAMS.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	25.62	8.24	4.646	0.31(0.10)	0.32	5.7	30.00
2	26.00	8.74	4.493	0.31(0.10)	0.32	6.0	38.00
3	26.28	9.14	4.379	0.31(0.10)	0.32	6.2	30.00

```
      4       26.33    9.26    4.347  0.31( 0.10) 0.32       6.3      36.00
      5       26.50    9.81    4.205  0.31( 0.10) 0.32       6.5      14.00
      6       26.63   10.11    4.134  0.31( 0.10) 0.32       6.7      26.00
      7       26.64   10.17    4.119  0.31( 0.10) 0.32       6.7      27.00
      8       26.74   10.85    3.968  0.31( 0.10) 0.32       7.0      20.00
      9       26.62   11.33    3.873  0.31( 0.10) 0.31       7.2      17.00
     10       26.60   11.40    3.859  0.31( 0.10) 0.31       7.2      23.00
     11       26.58   11.43    3.853  0.31( 0.10) 0.31       7.2      29.00
     12       25.63   12.87    3.600  0.31( 0.10) 0.31       7.5      34.00
     13       25.45   13.10    3.564  0.31( 0.10) 0.31       7.5      24.00
     14       23.32   15.76    3.205  0.31( 0.09) 0.30       7.8      12.00
     15       20.86   19.10    2.870  0.31( 0.09) 0.30       7.9      10.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      26.74    Tc(MIN.) =    10.85
  EFFECTIVE AREA(ACRES) =       7.05   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.31  AREA-AVERAGED Ap =  0.32
  TOTAL AREA(ACRES) =        7.9
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     33.00 =    1705.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     38.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   150.50  DOWNSTREAM(FEET) =   150.20
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  27.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.67
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      26.74
  PIPE TRAVEL TIME(MIN.) =   0.54    Tc(MIN.) =   11.39
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     38.00 =    1855.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     38.00 TO NODE     38.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     39.00 TO NODE     40.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  ELEVATION DATA: UPSTREAM(FEET) =    168.00  DOWNSTREAM(FEET) =    166.90

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.822
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.975
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
```

```
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.80      0.30      0.350    76   10.82
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      2.79
  TOTAL AREA(ACRES) =      0.80   PEAK FLOW RATE(CFS) =      2.79

****************************************************************************
  FLOW PROCESS FROM NODE     40.00 TO NODE     41.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   154.00  DOWNSTREAM(FEET) =   151.10
  FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   4.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.38
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.79
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =   10.89
  LONGEST FLOWPATH FROM NODE     39.00 TO NODE     41.00 =     340.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     41.00 TO NODE     41.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   10.89
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.962
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  CONDOMINIUMS               B        0.45      0.30      0.350    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA AREA(ACRES) =    0.45      SUBAREA RUNOFF(CFS) =    1.56
  EFFECTIVE AREA(ACRES) =      1.25   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        1.2       PEAK FLOW RATE(CFS) =       4.34

****************************************************************************
  FLOW PROCESS FROM NODE     41.00 TO NODE     42.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   151.10  DOWNSTREAM(FEET) =   150.60
  FLOW LENGTH(FEET) =   270.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.84
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.34
```

```
  PIPE TRAVEL TIME(MIN.) =   1.58    Tc(MIN.) =   12.47
  LONGEST FLOWPATH FROM NODE     39.00 TO NODE     42.00 =     610.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     42.00 TO NODE     42.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  MAINLINE Tc(MIN.) =   12.47
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.665
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  CONDOMINIUMS               B        1.15      0.30     0.350    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA AREA(ACRES) =    1.15      SUBAREA RUNOFF(CFS) =    3.68
  EFFECTIVE AREA(ACRES) =      2.40   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        2.4       PEAK FLOW RATE(CFS) =       7.69

****************************************************************************
  FLOW PROCESS FROM NODE     42.00 TO NODE     42.00 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.) =   12.47
  RAINFALL INTENSITY(INCH/HR) =   3.67
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       2.40
  TOTAL STREAM AREA(ACRES) =       2.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       7.69

****************************************************************************
  FLOW PROCESS FROM NODE     43.00 TO NODE     44.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   180.00
  ELEVATION DATA: UPSTREAM(FEET) =    168.00  DOWNSTREAM(FEET) =    166.20

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.218
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  5.013
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.44      0.30     0.350    76    7.22
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
```

```
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.94
  TOTAL AREA(ACRES) =      0.44   PEAK FLOW RATE(CFS) =      1.94

****************************************************************************
  FLOW PROCESS FROM NODE     44.00 TO NODE     42.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   153.00  DOWNSTREAM(FEET) =   150.60
  FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   4.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.98
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.94
  PIPE TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =    7.40
  LONGEST FLOWPATH FROM NODE     43.00 TO NODE     42.00 =     255.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     42.00 TO NODE     42.00 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.) =    7.40
  RAINFALL INTENSITY(INCH/HR) =   4.94
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.44
  TOTAL STREAM AREA(ACRES) =       0.44
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.94

****************************************************************************
  FLOW PROCESS FROM NODE     45.00 TO NODE     46.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   180.00
  ELEVATION DATA: UPSTREAM(FEET) =    168.00  DOWNSTREAM(FEET) =    166.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    7.390
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.946
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.45      0.30      0.350    76    7.39
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
```

```
  SUBAREA RUNOFF(CFS) =      1.96
  TOTAL AREA(ACRES) =      0.45   PEAK FLOW RATE(CFS) =      1.96

****************************************************************************
  FLOW PROCESS FROM NODE     46.00 TO NODE     42.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   153.00  DOWNSTREAM(FEET) =   150.60
  FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   4.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.02
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.96
  PIPE TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =    7.57
  LONGEST FLOWPATH FROM NODE     45.00 TO NODE     42.00 =     255.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     42.00 TO NODE     42.00 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.) =    7.57
  RAINFALL INTENSITY(INCH/HR) =   4.88
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.45
  TOTAL STREAM AREA(ACRES) =       0.45
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.96

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        7.69   12.47    3.665  0.30( 0.10) 0.35       2.4      39.00
      2        1.94    7.40    4.944  0.30( 0.11) 0.35       0.4      43.00
      3        1.96    7.57    4.879  0.30( 0.10) 0.35       0.4      45.00

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
  CONFLUENCE FORMULA USED FOR  3 STREAMS.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       10.09    7.40    4.944  0.30( 0.11) 0.35       2.3      43.00
      2       10.14    7.57    4.879  0.30( 0.10) 0.35       2.3      45.00
      3       10.58   12.47    3.665  0.30( 0.10) 0.35       3.3      39.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
```

```
  PEAK FLOW RATE(CFS) =      10.58    Tc(MIN.) =    12.47
  EFFECTIVE AREA(ACRES) =       3.29   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        3.3
  LONGEST FLOWPATH FROM NODE     39.00 TO NODE     42.00 =     610.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     42.00 TO NODE     38.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   150.60  DOWNSTREAM(FEET) =   150.20
  FLOW LENGTH(FEET) =   190.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.84
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.58
  PIPE TRAVEL TIME(MIN.) =   0.83    Tc(MIN.) =   13.29
  LONGEST FLOWPATH FROM NODE     39.00 TO NODE     38.00 =     800.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     38.00 TO NODE     38.00 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       10.09    8.26    4.641  0.30( 0.11) 0.35       2.3      43.00
      2       10.14    8.40    4.596  0.30( 0.10) 0.35       2.3      45.00
      3       10.58   13.29    3.533  0.30( 0.10) 0.35       3.3      39.00
  LONGEST FLOWPATH FROM NODE     39.00 TO NODE     38.00 =     800.00 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       25.62    8.78    4.480  0.31( 0.10) 0.32       5.7      30.00
      2       26.00    9.28    4.342  0.31( 0.10) 0.32       6.0      38.00
      3       26.28    9.68    4.238  0.31( 0.10) 0.32       6.2      30.00
      4       26.33    9.79    4.209  0.31( 0.10) 0.32       6.3      36.00
      5       26.50   10.35    4.078  0.31( 0.10) 0.32       6.5      14.00
      6       26.63   10.64    4.014  0.31( 0.10) 0.32       6.7      26.00
      7       26.64   10.71    3.999  0.31( 0.10) 0.32       6.7      27.00
      8       26.74   11.39    3.860  0.31( 0.10) 0.32       7.0      20.00
      9       26.62   11.86    3.772  0.31( 0.10) 0.31       7.2      17.00
     10       26.60   11.94    3.758  0.31( 0.10) 0.31       7.2      23.00
     11       26.58   11.96    3.753  0.31( 0.10) 0.31       7.2      29.00
     12       25.63   13.41    3.516  0.31( 0.10) 0.31       7.5      34.00
     13       25.45   13.64    3.482  0.31( 0.10) 0.31       7.5      24.00
     14       23.32   16.31    3.143  0.31( 0.09) 0.30       7.8      12.00
     15       20.86   19.67    2.823  0.31( 0.09) 0.30       7.9      10.00
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     38.00 =    1855.00 FEET.
```

```
 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)           (ACRES)     NODE
     1       35.06    8.26    4.641  0.31( 0.10) 0.33        7.7      43.00
     2       35.29    8.40    4.596  0.31( 0.10) 0.33        7.8      45.00
     3       35.79    8.78    4.480  0.31( 0.10) 0.33        8.1      30.00
     4       36.22    9.28    4.342  0.31( 0.10) 0.33        8.5      38.00
     5       36.53    9.68    4.238  0.31( 0.10) 0.33        8.8      30.00
     6       36.59    9.79    4.209  0.31( 0.10) 0.33        8.9      36.00
     7       36.81   10.35    4.078  0.31( 0.10) 0.33        9.2      14.00
     8       36.97   10.64    4.014  0.31( 0.10) 0.33        9.5      26.00
     9       36.99   10.71    3.999  0.31( 0.10) 0.33        9.5      27.00
    10       37.15   11.39    3.860  0.31( 0.10) 0.33       10.0      20.00
    11       37.07   11.86    3.772  0.31( 0.10) 0.33       10.2      17.00
    12       37.06   11.94    3.758  0.31( 0.10) 0.32       10.3      23.00
    13       37.05   11.96    3.753  0.31( 0.10) 0.32       10.3      29.00
    14       36.28   13.29    3.533  0.31( 0.10) 0.32       10.8      39.00
    15       36.16   13.41    3.516  0.31( 0.10) 0.32       10.8      34.00
    16       35.87   13.64    3.482  0.31( 0.10) 0.32       10.8      24.00
    17       32.70   16.31    3.143  0.31( 0.10) 0.32       11.1      12.00
    18       29.25   19.67    2.823  0.31( 0.10) 0.32       11.2      10.00
   TOTAL AREA(ACRES) =        11.2

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       37.15  Tc(MIN.) =   11.391
 EFFECTIVE AREA(ACRES) =      9.97  AREA-AVERAGED Fm(INCH/HR) =  0.10
 AREA-AVERAGED Fp(INCH/HR) =  0.31  AREA-AVERAGED Ap =  0.33
 TOTAL AREA(ACRES) =       11.2
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     38.00 =    1855.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     38.00 TO NODE     38.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE     38.00 TO NODE     47.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   150.20  DOWNSTREAM(FEET) =   149.90
 FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  42.0 INCH PIPE IS  29.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.11
 ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      37.15
 PIPE TRAVEL TIME(MIN.) =   0.49    Tc(MIN.) =   11.88
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     47.00 =    2005.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     47.00 TO NODE     47.00 IS CODE =  10
```

```
------------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
==============================================================================

******************************************************************************
  FLOW PROCESS FROM NODE     32.00 TO NODE     48.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.30  DOWNSTREAM(FEET) =    166.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.850
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.774
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        2.62      0.30     0.100    76   11.85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      8.83
  TOTAL AREA(ACRES) =      2.62   PEAK FLOW RATE(CFS) =      8.83

******************************************************************************
  FLOW PROCESS FROM NODE     48.00 TO NODE     49.00 IS CODE =  61
------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STANDARD CURB SECTION USED)<<<<<
==============================================================================
  UPSTREAM ELEVATION(FEET) =  166.00  DOWNSTREAM ELEVATION(FEET) =  165.60
  STREET LENGTH(FEET) =   485.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 25.00

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

  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
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.63
    HALFSTREET FLOOD WIDTH(FEET) =   31.53
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.09
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.69
  STREET FLOW TRAVEL TIME(MIN.) =   7.39   Tc(MIN.) =   19.24
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.859
  SUBAREA LOSS RATE DATA(AMC III):
```

```
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                  B        4.89      0.30      0.100    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    4.89      SUBAREA RUNOFF(CFS) =   12.45
  EFFECTIVE AREA(ACRES) =      7.51    AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        7.5        PEAK FLOW RATE(CFS) =      19.12

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.67   HALFSTREET FLOOD WIDTH(FEET) =  33.42
  FLOW VELOCITY(FEET/SEC.) =  1.18   DEPTH*VELOCITY(FT*FT/SEC.) =   0.79
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  485.0 FT WITH ELEVATION-DROP =   0.4 FT, IS   14.4 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE     49.00
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     49.00 =     785.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     49.00 TO NODE     50.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    165.60  DOWNSTREAM(FEET) =    165.40
  CHANNEL LENGTH THRU SUBAREA(FEET) =   180.00   CHANNEL SLOPE =  0.0011
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =   0.020
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      19.12
  FLOW VELOCITY(FEET/SEC.) =   2.96   FLOW DEPTH(FEET) =   1.28
  TRAVEL TIME(MIN.) =   1.01   Tc(MIN.) =   20.25
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     50.00 =     965.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     50.00 TO NODE     50.00 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.) =   20.25
  RAINFALL INTENSITY(INCH/HR) =   2.78
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       7.51
  TOTAL STREAM AREA(ACRES) =       7.51
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      19.12

****************************************************************************
  FLOW PROCESS FROM NODE     50.00 TO NODE     50.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
```

```
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   665.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.20  DOWNSTREAM(FEET) =    165.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.351
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.524
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        6.31      0.30      0.100    76   13.35
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =     19.84
  TOTAL AREA(ACRES) =      6.31   PEAK FLOW RATE(CFS) =     19.84

********************************************************************************
  FLOW PROCESS FROM NODE     50.00 TO NODE     50.00 IS CODE =   1
--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.35
  RAINFALL INTENSITY(INCH/HR) =   3.52
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       6.31
  TOTAL STREAM AREA(ACRES) =       6.31
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      19.84

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       19.12   20.25    2.776  0.30( 0.03) 0.10       7.5      32.00
      2       19.84   13.35    3.524  0.30( 0.03) 0.10       6.3      50.00

  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       35.89   13.35    3.524  0.30( 0.03) 0.10      11.3      50.00
      2       34.71   20.25    2.776  0.30( 0.03) 0.10      13.8      32.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      35.89    Tc(MIN.) =    13.35
  EFFECTIVE AREA(ACRES) =      11.26   AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =      13.8
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     50.00 =     965.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     50.00 TO NODE     47.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   162.40  DOWNSTREAM(FEET) =   149.90
  FLOW LENGTH(FEET) =   185.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  18.87
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      35.89
  PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =   13.51
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     47.00 =    1150.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     47.00 TO NODE     47.00 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       35.89   13.51    3.500  0.30( 0.03) 0.10      11.3      50.00
      2       34.71   20.41    2.763  0.30( 0.03) 0.10      13.8      32.00
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     47.00 =    1150.00 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       35.06    8.77    4.485  0.31( 0.10) 0.33       7.7      43.00
      2       35.29    8.91    4.445  0.31( 0.10) 0.33       7.8      45.00
      3       35.79    9.29    4.339  0.31( 0.10) 0.33       8.1      30.00
      4       36.22    9.77    4.215  0.31( 0.10) 0.33       8.5      38.00
      5       36.53   10.17    4.120  0.31( 0.10) 0.33       8.8      30.00
      6       36.59   10.29    4.093  0.31( 0.10) 0.33       8.9      36.00
      7       36.81   10.84    3.972  0.31( 0.10) 0.33       9.2      14.00
      8       36.97   11.13    3.912  0.31( 0.10) 0.33       9.5      26.00
      9       36.99   11.20    3.898  0.31( 0.10) 0.33       9.5      27.00
     10       37.15   11.88    3.768  0.31( 0.10) 0.33      10.0      20.00
     11       37.07   12.35    3.685  0.31( 0.10) 0.33      10.2      17.00
     12       37.06   12.42    3.673  0.31( 0.10) 0.32      10.3      23.00
     13       37.05   12.45    3.668  0.31( 0.10) 0.32      10.3      29.00
     14       36.28   13.78    3.460  0.31( 0.10) 0.32      10.8      39.00
     15       36.16   13.90    3.444  0.31( 0.10) 0.32      10.8      34.00
     16       35.87   14.14    3.410  0.31( 0.10) 0.32      10.8      24.00
     17       32.70   16.82    3.088  0.31( 0.10) 0.32      11.1      12.00
     18       29.25   20.19    2.781  0.31( 0.10) 0.32      11.2      10.00
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     47.00 =    2005.00 FEET.

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

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	64.95	8.77	4.485	0.31(0.07)	0.22	15.0	43.00
2	65.38	8.91	4.445	0.31(0.07)	0.22	15.2	45.00
3	66.42	9.29	4.339	0.31(0.07)	0.22	15.9	30.00
4	67.51	9.77	4.215	0.31(0.07)	0.22	16.6	38.00
5	68.36	10.17	4.120	0.31(0.07)	0.22	17.3	30.00
6	68.57	10.29	4.093	0.31(0.07)	0.22	17.5	36.00
7	69.50	10.84	3.972	0.31(0.07)	0.21	18.3	14.00
8	70.03	11.13	3.912	0.31(0.07)	0.21	18.8	26.00
9	70.14	11.20	3.898	0.31(0.07)	0.21	18.9	27.00
10	71.13	11.88	3.768	0.31(0.07)	0.21	19.9	20.00
11	71.62	12.35	3.685	0.31(0.07)	0.21	20.5	17.00
12	71.69	12.42	3.673	0.31(0.06)	0.21	20.6	23.00
13	71.71	12.45	3.668	0.31(0.06)	0.21	20.7	29.00
14	72.32	13.51	3.500	0.31(0.06)	0.21	21.9	50.00
15	72.12	13.78	3.460	0.31(0.06)	0.21	22.1	39.00
16	71.98	13.90	3.444	0.31(0.06)	0.21	22.2	34.00
17	71.65	14.14	3.410	0.31(0.06)	0.21	22.3	24.00
18	68.02	16.82	3.088	0.31(0.06)	0.20	23.6	12.00
19	64.00	20.19	2.781	0.31(0.06)	0.20	24.9	10.00
20	63.77	20.41	2.763	0.31(0.06)	0.20	25.0	32.00
TOTAL AREA(ACRES) =		25.0					

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 72.32 Tc(MIN.) = 13.514
EFFECTIVE AREA(ACRES) = 21.94 AREA-AVERAGED Fm(INCH/HR) = 0.06
AREA-AVERAGED Fp(INCH/HR) = 0.31 AREA-AVERAGED Ap = 0.22
TOTAL AREA(ACRES) = 25.0
LONGEST FLOWPATH FROM NODE 10.00 TO NODE 47.00 = 2005.00 FEET.

****
FLOW PROCESS FROM NODE 47.00 TO NODE 47.00 IS CODE = 12

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

****
FLOW PROCESS FROM NODE 47.00 TO NODE 47.00 IS CODE = 1

>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 13.51
RAINFALL INTENSITY(INCH/HR) = 3.50
AREA-AVERAGED Fm(INCH/HR) = 0.06
AREA-AVERAGED Fp(INCH/HR) = 0.31
AREA-AVERAGED Ap = 0.21
EFFECTIVE STREAM AREA(ACRES) = 21.94
TOTAL STREAM AREA(ACRES) = 25.00
PEAK FLOW RATE(CFS) AT CONFLUENCE = 72.32

****
FLOW PROCESS FROM NODE 51.00 TO NODE 52.00 IS CODE = 21

```
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   140.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.70  DOWNSTREAM(FEET) =    166.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.386
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.600
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.64      0.30     0.350    76    8.39
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      2.59
  TOTAL AREA(ACRES) =      0.64   PEAK FLOW RATE(CFS) =      2.59

************************************************************************
  FLOW PROCESS FROM NODE     52.00 TO NODE     47.00 IS CODE =  31
------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   156.00  DOWNSTREAM(FEET) =   149.90
  FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   3.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.30
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.59
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    8.44
  LONGEST FLOWPATH FROM NODE     51.00 TO NODE     47.00 =     180.00 FEET.

************************************************************************
  FLOW PROCESS FROM NODE     47.00 TO NODE     47.00 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.) =    8.44
  RAINFALL INTENSITY(INCH/HR) =   4.58
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.64
  TOTAL STREAM AREA(ACRES) =       0.64
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.59

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
```

NUMBER	(CFS)	(MIN.)	(INCH/HR)	(INCH/HR)		(ACRES)	NODE
1	64.95	8.77	4.485	0.31(0.07)	0.22	15.0	43.00
1	65.38	8.91	4.445	0.31(0.07)	0.22	15.2	45.00
1	66.42	9.29	4.339	0.31(0.07)	0.22	15.9	30.00
1	67.51	9.77	4.215	0.31(0.07)	0.22	16.6	38.00
1	68.36	10.17	4.120	0.31(0.07)	0.22	17.3	30.00
1	68.57	10.29	4.093	0.31(0.07)	0.22	17.5	36.00
1	69.50	10.84	3.972	0.31(0.07)	0.21	18.3	14.00
1	70.03	11.13	3.912	0.31(0.07)	0.21	18.8	26.00
1	70.14	11.20	3.898	0.31(0.07)	0.21	18.9	27.00
1	71.13	11.88	3.768	0.31(0.07)	0.21	19.9	20.00
1	71.62	12.35	3.685	0.31(0.07)	0.21	20.5	17.00
1	71.69	12.42	3.673	0.31(0.06)	0.21	20.6	23.00
1	71.71	12.45	3.668	0.31(0.06)	0.21	20.7	29.00
1	72.32	13.51	3.500	0.31(0.06)	0.21	21.9	50.00
1	72.12	13.78	3.460	0.31(0.06)	0.21	22.1	39.00
1	71.98	13.90	3.444	0.31(0.06)	0.21	22.2	34.00
1	71.65	14.14	3.410	0.31(0.06)	0.21	22.3	24.00
1	68.02	16.82	3.088	0.31(0.06)	0.20	23.6	12.00
1	64.00	20.19	2.781	0.31(0.06)	0.20	24.9	10.00
1	63.77	20.41	2.763	0.31(0.06)	0.20	25.0	32.00
2	2.59	8.44	4.585	0.30(0.10)	0.35	0.6	51.00

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	66.51	8.44	4.585	0.31(0.07)	0.22		15.1	51.00
2	67.48	8.77	4.485	0.31(0.07)	0.22		15.6	43.00
3	67.89	8.91	4.445	0.31(0.07)	0.22		15.9	45.00
4	68.87	9.29	4.339	0.31(0.07)	0.22		16.5	30.00
5	69.88	9.77	4.215	0.31(0.07)	0.22		17.3	38.00
6	70.68	10.17	4.120	0.31(0.07)	0.22		17.9	30.00
7	70.88	10.29	4.093	0.31(0.07)	0.22		18.1	36.00
8	71.74	10.84	3.972	0.31(0.07)	0.22		18.9	14.00
9	72.24	11.13	3.912	0.31(0.07)	0.22		19.4	26.00
10	72.33	11.20	3.898	0.31(0.07)	0.22		19.5	27.00
11	73.25	11.88	3.768	0.31(0.07)	0.22		20.5	20.00
12	73.69	12.35	3.685	0.31(0.07)	0.22		21.2	17.00
13	73.76	12.42	3.673	0.31(0.07)	0.22		21.3	23.00
14	73.77	12.45	3.668	0.31(0.07)	0.22		21.3	29.00
15	74.29	13.51	3.500	0.31(0.07)	0.21		22.6	50.00
16	74.06	13.78	3.460	0.31(0.07)	0.21		22.8	39.00
17	73.91	13.90	3.444	0.31(0.06)	0.21		22.8	34.00
18	73.56	14.14	3.410	0.31(0.06)	0.21		23.0	24.00
19	69.75	16.82	3.088	0.31(0.06)	0.21		24.2	12.00
20	65.55	20.19	2.781	0.31(0.06)	0.20		25.6	10.00
21	65.30	20.41	2.763	0.31(0.06)	0.20		25.6	32.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 74.29 Tc(MIN.) = 13.51
EFFECTIVE AREA(ACRES) = 22.58 AREA-AVERAGED Fm(INCH/HR) = 0.07

```
  AREA-AVERAGED Fp(INCH/HR) =  0.31  AREA-AVERAGED Ap =  0.21
  TOTAL AREA(ACRES) =       25.6
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     47.00 =    2005.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     47.00 TO NODE     53.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   149.80  DOWNSTREAM(FEET) =   149.70
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  60.0 INCH PIPE IS  45.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.64
  ESTIMATED PIPE DIAMETER(INCH) =  60.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      74.29
  PIPE TRAVEL TIME(MIN.) =   0.36    Tc(MIN.) =   13.87
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     53.00 =    2105.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     53.00 TO NODE     53.00 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.) =   13.87
  RAINFALL INTENSITY(INCH/HR) =   3.45
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.31
  AREA-AVERAGED Ap =  0.21
  EFFECTIVE STREAM AREA(ACRES) =      22.58
  TOTAL STREAM AREA(ACRES) =      25.64
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      74.29

****************************************************************************
  FLOW PROCESS FROM NODE     38.00 TO NODE     54.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   265.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.40  DOWNSTREAM(FEET) =    165.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.340
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.870
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.80      0.30      0.350    76   11.34
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      2.71
```

```
  TOTAL AREA(ACRES) =      0.80   PEAK FLOW RATE(CFS) =      2.71

****************************************************************************
  FLOW PROCESS FROM NODE     54.00 TO NODE     53.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   149.80  DOWNSTREAM(FEET) =   149.70
  FLOW LENGTH(FEET) =    70.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.37
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.71
  PIPE TRAVEL TIME(MIN.) =   0.49    Tc(MIN.) =   11.83
  LONGEST FLOWPATH FROM NODE     38.00 TO NODE     53.00 =     335.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     53.00 TO NODE     53.00 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.) =   11.83
  RAINFALL INTENSITY(INCH/HR) =   3.78
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.80
  TOTAL STREAM AREA(ACRES) =       0.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.71

****************************************************************************
  FLOW PROCESS FROM NODE     55.00 TO NODE     56.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   130.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    166.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.214
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.359
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.19      0.30      0.350    76    9.21
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.73
  TOTAL AREA(ACRES) =      0.19   PEAK FLOW RATE(CFS) =      0.73
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     56.00 TO NODE     53.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   156.00  DOWNSTREAM(FEET) =   149.70
  FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   1.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.25
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.73
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =    9.29
  LONGEST FLOWPATH FROM NODE     55.00 TO NODE     53.00 =     170.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     53.00 TO NODE     53.00 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.) =    9.29
  RAINFALL INTENSITY(INCH/HR) =   4.34
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.19
  TOTAL STREAM AREA(ACRES) =       0.19
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.73

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       66.51    8.81    4.473  0.31( 0.07) 0.22      15.1      51.00
      1       67.48    9.14    4.380  0.31( 0.07) 0.22      15.6      43.00
      1       67.89    9.28    4.342  0.31( 0.07) 0.22      15.9      45.00
      1       68.87    9.66    4.243  0.31( 0.07) 0.22      16.5      30.00
      1       69.88   10.14    4.126  0.31( 0.07) 0.22      17.3      38.00
      1       70.68   10.53    4.038  0.31( 0.07) 0.22      17.9      30.00
      1       70.88   10.65    4.013  0.31( 0.07) 0.22      18.1      36.00
      1       71.74   11.20    3.898  0.31( 0.07) 0.22      18.9      14.00
      1       72.24   11.49    3.841  0.31( 0.07) 0.22      19.4      26.00
      1       72.33   11.56    3.828  0.31( 0.07) 0.22      19.5      27.00
      1       73.25   12.24    3.704  0.31( 0.07) 0.22      20.5      20.00
      1       73.69   12.71    3.625  0.31( 0.07) 0.22      21.2      17.00
      1       73.76   12.78    3.613  0.31( 0.07) 0.22      21.3      23.00
      1       73.77   12.81    3.609  0.31( 0.07) 0.22      21.3      29.00
      1       74.29   13.87    3.448  0.31( 0.07) 0.21      22.6      50.00
      1       74.06   14.14    3.410  0.31( 0.07) 0.21      22.8      39.00
      1       73.91   14.26    3.394  0.31( 0.06) 0.21      22.8      34.00
      1       73.56   14.50    3.362  0.31( 0.06) 0.21      23.0      24.00
```

1	69.75	17.19	3.050	0.31(0.06)	0.21	24.2	12.00
1	65.55	20.56	2.752	0.31(0.06)	0.20	25.6	10.00
1	65.30	20.79	2.735	0.31(0.06)	0.20	25.6	32.00
2	2.71	11.83	3.777	0.30(0.11)	0.35	0.8	38.00
3	0.73	9.29	4.339	0.30(0.11)	0.35	0.2	55.00

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	69.62	8.81	4.473	0.31(0.07)	0.23	15.8	51.00
2	70.64	9.14	4.380	0.31(0.07)	0.23	16.4	43.00
3	71.06	9.28	4.342	0.31(0.07)	0.23	16.7	45.00
4	71.09	9.29	4.339	0.31(0.07)	0.23	16.7	55.00
5	72.07	9.66	4.243	0.31(0.07)	0.23	17.3	30.00
6	73.12	10.14	4.126	0.31(0.07)	0.23	18.2	38.00
7	73.94	10.53	4.038	0.31(0.07)	0.23	18.8	30.00
8	74.14	10.65	4.013	0.31(0.07)	0.23	19.0	36.00
9	75.04	11.20	3.898	0.31(0.07)	0.23	19.9	14.00
10	75.56	11.49	3.841	0.31(0.07)	0.23	20.4	26.00
11	75.66	11.56	3.828	0.31(0.07)	0.22	20.5	27.00
12	76.04	11.83	3.777	0.31(0.07)	0.22	20.9	38.00
13	76.53	12.24	3.704	0.31(0.07)	0.22	21.5	20.00
14	76.89	12.71	3.625	0.31(0.07)	0.22	22.2	17.00
15	76.95	12.78	3.613	0.31(0.07)	0.22	22.3	23.00
16	76.96	12.81	3.609	0.31(0.07)	0.22	22.3	29.00
17	77.33	13.87	3.448	0.31(0.07)	0.22	23.6	50.00
18	77.07	14.14	3.410	0.31(0.07)	0.22	23.8	39.00
19	76.90	14.26	3.394	0.31(0.07)	0.22	23.8	34.00
20	76.53	14.50	3.362	0.31(0.07)	0.22	24.0	24.00
21	72.43	17.19	3.050	0.31(0.06)	0.21	25.2	12.00
22	67.95	20.56	2.752	0.31(0.06)	0.21	26.5	10.00
23	67.70	20.79	2.735	0.31(0.06)	0.21	26.6	32.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 77.33 Tc(MIN.) = 13.87
EFFECTIVE AREA(ACRES) = 23.57 AREA-AVERAGED Fm(INCH/HR) = 0.07
AREA-AVERAGED Fp(INCH/HR) = 0.31 AREA-AVERAGED Ap = 0.22
TOTAL AREA(ACRES) = 26.6
LONGEST FLOWPATH FROM NODE 10.00 TO NODE 53.00 = 2105.00 FEET.

****
FLOW PROCESS FROM NODE 53.00 TO NODE 57.00 IS CODE = 31

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==
ELEVATION DATA: UPSTREAM(FEET) = 149.70 DOWNSTREAM(FEET) = 149.10
FLOW LENGTH(FEET) = 280.00 MANNING'S N = 0.013
DEPTH OF FLOW IN 54.0 INCH PIPE IS 39.0 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) = 6.29
ESTIMATED PIPE DIAMETER(INCH) = 54.00 NUMBER OF PIPES = 1

```
  PIPE-FLOW(CFS) =      77.33
  PIPE TRAVEL TIME(MIN.) =   0.74    Tc(MIN.) =   14.62
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     57.00 =    2385.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     58.00 TO NODE     57.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   240.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.60

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.853
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.195
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.46      0.30      0.350    76    9.85
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.69
  TOTAL AREA(ACRES) =      0.46   PEAK FLOW RATE(CFS) =      1.69

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 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.) =    9.85
  RAINFALL INTENSITY(INCH/HR) =   4.19
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.46
  TOTAL STREAM AREA(ACRES) =       0.46
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.69

****************************************************************************
  FLOW PROCESS FROM NODE     59.00 TO NODE     57.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   265.00
```

```
 ELEVATION DATA: UPSTREAM(FEET) =    166.80  DOWNSTREAM(FEET) =    165.80

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.239
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.103
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 CONDOMINIUMS               B        0.57      0.30      0.350    76   10.24
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
 SUBAREA RUNOFF(CFS) =      2.05
 TOTAL AREA(ACRES) =      0.57   PEAK FLOW RATE(CFS) =      2.05

****************************************************************************
 FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 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.) =   10.24
 RAINFALL INTENSITY(INCH/HR) =   4.10
 AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.35
 EFFECTIVE STREAM AREA(ACRES) =       0.57
 TOTAL STREAM AREA(ACRES) =       0.57
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.05

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        1.69    9.85    4.195  0.30( 0.11) 0.35       0.5      58.00
     2        2.05   10.24    4.103  0.30( 0.11) 0.35       0.6      59.00

 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        3.71    9.85    4.195  0.30( 0.11) 0.35       1.0      58.00
     2        3.71   10.24    4.103  0.30( 0.11) 0.35       1.0      59.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       3.71    Tc(MIN.) =     9.85
 EFFECTIVE AREA(ACRES) =       1.01   AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
 TOTAL AREA(ACRES) =        1.0
 LONGEST FLOWPATH FROM NODE     59.00 TO NODE     57.00 =     265.00 FEET.

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

FLOW PROCESS FROM NODE 57.00 TO NODE 57.00 IS CODE = 11

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

==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	3.71	9.85	4.195	0.30(0.11)	0.35	1.0	58.00
2	3.71	10.24	4.103	0.30(0.11)	0.35	1.0	59.00

LONGEST FLOWPATH FROM NODE 59.00 TO NODE 57.00 = 265.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	69.62	9.57	4.264	0.31(0.07)	0.23	15.8	51.00
2	70.64	9.90	4.183	0.31(0.07)	0.23	16.4	43.00
3	71.06	10.04	4.149	0.31(0.07)	0.23	16.7	45.00
4	71.09	10.05	4.147	0.31(0.07)	0.23	16.7	55.00
5	72.07	10.42	4.062	0.31(0.07)	0.23	17.3	30.00
6	73.12	10.90	3.958	0.31(0.07)	0.23	18.2	38.00
7	73.94	11.29	3.880	0.31(0.07)	0.23	18.8	30.00
8	74.14	11.41	3.857	0.31(0.07)	0.23	19.0	36.00
9	75.04	11.96	3.754	0.31(0.07)	0.23	19.9	14.00
10	75.56	12.25	3.702	0.31(0.07)	0.23	20.4	26.00
11	75.66	12.32	3.691	0.31(0.07)	0.22	20.5	27.00
12	76.04	12.59	3.644	0.31(0.07)	0.22	20.9	38.00
13	76.53	12.98	3.581	0.31(0.07)	0.22	21.5	20.00
14	76.89	13.45	3.509	0.31(0.07)	0.22	22.2	17.00
15	76.95	13.53	3.498	0.31(0.07)	0.22	22.3	23.00
16	76.96	13.55	3.494	0.31(0.07)	0.22	22.3	29.00
17	77.33	14.62	3.346	0.31(0.07)	0.22	23.6	50.00
18	77.07	14.89	3.311	0.31(0.07)	0.22	23.8	39.00
19	76.90	15.00	3.297	0.31(0.07)	0.22	23.8	34.00
20	76.53	15.24	3.267	0.31(0.07)	0.22	24.0	24.00
21	72.43	17.95	2.975	0.31(0.06)	0.21	25.2	12.00
22	67.95	21.33	2.695	0.31(0.06)	0.21	26.5	10.00
23	67.70	21.56	2.678	0.31(0.06)	0.21	26.6	32.00

LONGEST FLOWPATH FROM NODE 10.00 TO NODE 57.00 = 2385.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	73.29	9.57	4.264	0.31(0.07)	0.24	16.8	51.00
2	74.20	9.85	4.195	0.31(0.07)	0.24	17.3	58.00
3	74.35	9.90	4.183	0.31(0.07)	0.24	17.4	43.00
4	74.77	10.04	4.149	0.31(0.07)	0.24	17.7	45.00
5	74.80	10.05	4.147	0.31(0.07)	0.24	17.7	55.00
6	75.29	10.24	4.103	0.31(0.07)	0.24	18.1	59.00
7	75.74	10.42	4.062	0.31(0.07)	0.23	18.4	30.00
8	76.69	10.90	3.958	0.31(0.07)	0.23	19.2	38.00
9	77.44	11.29	3.880	0.31(0.07)	0.23	19.9	30.00
10	77.62	11.41	3.857	0.31(0.07)	0.23	20.0	36.00
11	78.42	11.96	3.754	0.31(0.07)	0.23	20.9	14.00

```
    12       78.89   12.25    3.702  0.31( 0.07) 0.23      21.4      26.00
    13       78.98   12.32    3.691  0.31( 0.07) 0.23      21.5      27.00
    14       79.32   12.59    3.644  0.31( 0.07) 0.23      21.9      38.00
    15       79.75   12.98    3.581  0.31( 0.07) 0.23      22.5      20.00
    16       80.05   13.45    3.509  0.31( 0.07) 0.23      23.2      17.00
    17       80.09   13.53    3.498  0.31( 0.07) 0.23      23.3      23.00
    18       80.10   13.55    3.494  0.31( 0.07) 0.23      23.3      29.00
    19       80.33   14.62    3.346  0.31( 0.07) 0.22      24.6      50.00
    20       80.04   14.89    3.311  0.31( 0.07) 0.22      24.8      39.00
    21       79.86   15.00    3.297  0.31( 0.07) 0.22      24.9      34.00
    22       79.46   15.24    3.267  0.31( 0.07) 0.22      25.0      24.00
    23       75.09   17.95    2.975  0.30( 0.07) 0.22      26.2      12.00
    24       70.35   21.33    2.695  0.30( 0.06) 0.21      27.6      10.00
    25       70.08   21.56    2.678  0.30( 0.06) 0.21      27.7      32.00
  TOTAL AREA(ACRES) =        27.7

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       80.33  Tc(MIN.) =   14.616
  EFFECTIVE AREA(ACRES) =     24.60  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.31  AREA-AVERAGED Ap =  0.22
  TOTAL AREA(ACRES) =       27.7
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     57.00 =    2385.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     60.00 TO NODE     61.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   200.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.00  DOWNSTREAM(FEET) =    166.20

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.043
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.406
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.27      0.30      0.350    76    9.04
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.05
```

```
  TOTAL AREA(ACRES) =      0.27   PEAK FLOW RATE(CFS) =      1.05

****************************************************************************
  FLOW PROCESS FROM NODE     61.00 TO NODE     62.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   166.20  DOWNSTREAM(FEET) =   165.30
  FLOW LENGTH(FEET) =   210.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   5.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.84
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.05
  PIPE TRAVEL TIME(MIN.) =   1.23    Tc(MIN.) =   10.28
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     62.00 =     410.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     62.00 TO NODE     62.00 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.) =   10.28
  RAINFALL INTENSITY(INCH/HR) =   4.10
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.27
  TOTAL STREAM AREA(ACRES) =       0.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.05

****************************************************************************
  FLOW PROCESS FROM NODE     63.00 TO NODE     62.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   270.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.984
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.163
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.70      0.30      0.350    76    9.98
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      2.56
  TOTAL AREA(ACRES) =      0.70   PEAK FLOW RATE(CFS) =      2.56
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     62.00 TO NODE     62.00 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.) =    9.98
  RAINFALL INTENSITY(INCH/HR) =   4.16
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.70
  TOTAL STREAM AREA(ACRES) =       0.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.56

****************************************************************************
  FLOW PROCESS FROM NODE     64.00 TO NODE     62.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   295.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.50  DOWNSTREAM(FEET) =    165.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   20.647
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  2.745
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  AGRICULTURAL FAIR COVER
  "PASTURE,IRRIGATED"        B        0.27      0.30     1.000    83   20.65
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  1.000
  SUBAREA RUNOFF(CFS) =      0.59
  TOTAL AREA(ACRES) =      0.27   PEAK FLOW RATE(CFS) =      0.59

****************************************************************************
  FLOW PROCESS FROM NODE     62.00 TO NODE     62.00 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.) =   20.65
  RAINFALL INTENSITY(INCH/HR) =   2.75
  AREA-AVERAGED Fm(INCH/HR) =  0.30
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  1.00
  EFFECTIVE STREAM AREA(ACRES) =       0.27
  TOTAL STREAM AREA(ACRES) =       0.27
```

```
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.59

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        1.05   10.28    4.095  0.30( 0.10) 0.35       0.3      60.00
     2        2.56    9.98    4.163  0.30( 0.11) 0.35       0.7      63.00
     3        0.59   20.65    2.745  0.30( 0.30) 1.00       0.3      64.00

 RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
 CONFLUENCE FORMULA USED FOR  3 STREAMS.

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        4.04    9.98    4.163  0.30( 0.13) 0.43       1.1      63.00
     2        4.02   10.28    4.095  0.30( 0.13) 0.43       1.1      60.00
     3        2.95   20.65    2.745  0.30( 0.15) 0.49       1.2      64.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       4.04    Tc(MIN.) =     9.98
 EFFECTIVE AREA(ACRES) =       1.09   AREA-AVERAGED Fm(INCH/HR) =  0.13
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.43
 TOTAL AREA(ACRES) =        1.2
 LONGEST FLOWPATH FROM NODE     60.00 TO NODE     62.00 =     410.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     62.00 TO NODE     57.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   156.00  DOWNSTREAM(FEET) =   149.10
 FLOW LENGTH(FEET) =   245.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.02
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       4.04
 PIPE TRAVEL TIME(MIN.) =   0.51    Tc(MIN.) =   10.49
 LONGEST FLOWPATH FROM NODE     60.00 TO NODE     57.00 =     655.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 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        4.04   10.49    4.046  0.30( 0.13) 0.43       1.1      63.00
     2        4.02   10.79    3.983  0.30( 0.13) 0.43       1.1      60.00
     3        2.95   21.20    2.704  0.30( 0.15) 0.49       1.2      64.00
 LONGEST FLOWPATH FROM NODE     60.00 TO NODE     57.00 =     655.00 FEET.
```

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	73.29	9.57	4.264	0.31(0.07)	0.24	16.8	51.00
2	74.20	9.85	4.195	0.31(0.07)	0.24	17.3	58.00
3	74.35	9.90	4.183	0.31(0.07)	0.24	17.4	43.00
4	74.77	10.04	4.149	0.31(0.07)	0.24	17.7	45.00
5	74.80	10.05	4.147	0.31(0.07)	0.24	17.7	55.00
6	75.29	10.24	4.103	0.31(0.07)	0.24	18.1	59.00
7	75.74	10.42	4.062	0.31(0.07)	0.23	18.4	30.00
8	76.69	10.90	3.958	0.31(0.07)	0.23	19.2	38.00
9	77.44	11.29	3.880	0.31(0.07)	0.23	19.9	30.00
10	77.62	11.41	3.857	0.31(0.07)	0.23	20.0	36.00
11	78.42	11.96	3.754	0.31(0.07)	0.23	20.9	14.00
12	78.89	12.25	3.702	0.31(0.07)	0.23	21.4	26.00
13	78.98	12.32	3.691	0.31(0.07)	0.23	21.5	27.00
14	79.32	12.59	3.644	0.31(0.07)	0.23	21.9	38.00
15	79.75	12.98	3.581	0.31(0.07)	0.23	22.5	20.00
16	80.05	13.45	3.509	0.31(0.07)	0.23	23.2	17.00
17	80.09	13.53	3.498	0.31(0.07)	0.23	23.3	23.00
18	80.10	13.55	3.494	0.31(0.07)	0.23	23.3	29.00
19	80.33	14.62	3.346	0.31(0.07)	0.22	24.6	50.00
20	80.04	14.89	3.311	0.31(0.07)	0.22	24.8	39.00
21	79.86	15.00	3.297	0.31(0.07)	0.22	24.9	34.00
22	79.46	15.24	3.267	0.31(0.07)	0.22	25.0	24.00
23	75.09	17.95	2.975	0.30(0.07)	0.22	26.2	12.00
24	70.35	21.33	2.695	0.30(0.06)	0.21	27.6	10.00
25	70.08	21.56	2.678	0.30(0.06)	0.21	27.7	32.00

LONGEST FLOWPATH FROM NODE 10.00 TO NODE 57.00 = 2385.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	77.18	9.57	4.264	0.30(0.08)	0.25	17.8	51.00
2	78.14	9.85	4.195	0.30(0.07)	0.25	18.4	58.00
3	78.30	9.90	4.183	0.30(0.07)	0.25	18.5	43.00
4	78.75	10.04	4.149	0.30(0.07)	0.25	18.7	45.00
5	78.77	10.05	4.147	0.30(0.07)	0.25	18.8	55.00
6	79.30	10.24	4.103	0.30(0.07)	0.25	19.1	59.00
7	79.77	10.42	4.062	0.30(0.07)	0.25	19.5	30.00
8	79.92	10.49	4.046	0.30(0.07)	0.25	19.6	63.00
9	80.48	10.79	3.983	0.30(0.07)	0.24	20.1	60.00
10	80.70	10.90	3.958	0.30(0.07)	0.24	20.3	38.00
11	81.40	11.29	3.880	0.30(0.07)	0.24	21.0	30.00
12	81.57	11.41	3.857	0.30(0.07)	0.24	21.2	36.00
13	82.32	11.96	3.754	0.30(0.07)	0.24	22.0	14.00
14	82.76	12.25	3.702	0.30(0.07)	0.24	22.5	26.00
15	82.84	12.32	3.691	0.30(0.07)	0.24	22.6	27.00
16	83.16	12.59	3.644	0.30(0.07)	0.24	23.1	38.00
17	83.54	12.98	3.581	0.31(0.07)	0.24	23.7	20.00
18	83.79	13.45	3.509	0.30(0.07)	0.24	24.3	17.00
19	83.83	13.53	3.498	0.30(0.07)	0.24	24.4	23.00
20	83.84	13.55	3.494	0.30(0.07)	0.24	24.5	29.00

```
     21       83.96   14.62    3.346  0.30( 0.07) 0.23      25.8      50.00
     22       83.64   14.89    3.311  0.30( 0.07) 0.23      26.0      39.00
     23       83.45   15.00    3.297  0.30( 0.07) 0.23      26.0      34.00
     24       83.02   15.24    3.267  0.30( 0.07) 0.23      26.1      24.00
     25       78.37   17.95    2.975  0.30( 0.07) 0.23      27.4      12.00
     26       73.49   21.20    2.704  0.30( 0.07) 0.22      28.8      64.00
     27       73.29   21.33    2.695  0.30( 0.07) 0.22      28.8      10.00
     28       73.00   21.56    2.678  0.30( 0.07) 0.22      28.9      32.00
    TOTAL AREA(ACRES) =        28.9

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       83.96  Tc(MIN.) =   14.616
  EFFECTIVE AREA(ACRES) =     25.75  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.23
  TOTAL AREA(ACRES) =       28.9
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     57.00 =    2385.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.62
  RAINFALL INTENSITY(INCH/HR) =   3.35
  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.23
  EFFECTIVE STREAM AREA(ACRES) =      25.75
  TOTAL STREAM AREA(ACRES) =      28.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      83.96

****************************************************************************
  FLOW PROCESS FROM NODE     65.00 TO NODE     66.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   135.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.70  DOWNSTREAM(FEET) =    166.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.205
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.658
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
```

```
  CONDOMINIUMS                B        0.19      0.30     0.350    76    8.21
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      0.78
  TOTAL AREA(ACRES) =      0.19   PEAK FLOW RATE(CFS) =      0.78

****************************************************************************
  FLOW PROCESS FROM NODE     66.00 TO NODE     57.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   156.00  DOWNSTREAM(FEET) =   149.10
  FLOW LENGTH(FEET) =    45.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO 12.000
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   1.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.40
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.78
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    8.29
  LONGEST FLOWPATH FROM NODE     65.00 TO NODE     57.00 =     180.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 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.) =    8.29
  RAINFALL INTENSITY(INCH/HR) =   4.63
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.19
  TOTAL STREAM AREA(ACRES) =       0.19
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       0.78

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1       77.18    9.57    4.264  0.30( 0.08) 0.25      17.8      51.00
      1       78.14    9.85    4.195  0.30( 0.07) 0.25      18.4      58.00
      1       78.30    9.90    4.183  0.30( 0.07) 0.25      18.5      43.00
      1       78.75   10.04    4.149  0.30( 0.07) 0.25      18.7      45.00
      1       78.77   10.05    4.147  0.30( 0.07) 0.25      18.8      55.00
      1       79.30   10.24    4.103  0.30( 0.07) 0.25      19.1      59.00
      1       79.77   10.42    4.062  0.30( 0.07) 0.25      19.5      30.00
      1       79.92   10.49    4.046  0.30( 0.07) 0.25      19.6      63.00
      1       80.48   10.79    3.983  0.30( 0.07) 0.24      20.1      60.00
      1       80.70   10.90    3.958  0.30( 0.07) 0.24      20.3      38.00
      1       81.40   11.29    3.880  0.30( 0.07) 0.24      21.0      30.00
      1       81.57   11.41    3.857  0.30( 0.07) 0.24      21.2      36.00
```

1	82.32	11.96	3.754	0.30(0.07)	0.24	22.0	14.00
1	82.76	12.25	3.702	0.30(0.07)	0.24	22.5	26.00
1	82.84	12.32	3.691	0.30(0.07)	0.24	22.6	27.00
1	83.16	12.59	3.644	0.30(0.07)	0.24	23.1	38.00
1	83.54	12.98	3.581	0.31(0.07)	0.24	23.7	20.00
1	83.79	13.45	3.509	0.30(0.07)	0.24	24.3	17.00
1	83.83	13.53	3.498	0.30(0.07)	0.24	24.4	23.00
1	83.84	13.55	3.494	0.30(0.07)	0.24	24.5	29.00
1	83.96	14.62	3.346	0.30(0.07)	0.23	25.8	50.00
1	83.64	14.89	3.311	0.30(0.07)	0.23	26.0	39.00
1	83.45	15.00	3.297	0.30(0.07)	0.23	26.0	34.00
1	83.02	15.24	3.267	0.30(0.07)	0.23	26.1	24.00
1	78.37	17.95	2.975	0.30(0.07)	0.23	27.4	12.00
1	73.49	21.20	2.704	0.30(0.07)	0.22	28.8	64.00
1	73.29	21.33	2.695	0.30(0.07)	0.22	28.8	10.00
1	73.00	21.56	2.678	0.30(0.07)	0.22	28.9	32.00
2	0.78	8.29	4.633	0.30(0.11)	0.35	0.2	65.00

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	73.44	8.29	4.633	0.30(0.08)	0.25	15.6	65.00
2	77.90	9.57	4.264	0.30(0.08)	0.25	18.0	51.00
3	78.85	9.85	4.195	0.30(0.08)	0.25	18.6	58.00
4	79.00	9.90	4.183	0.30(0.08)	0.25	18.7	43.00
5	79.44	10.04	4.149	0.30(0.08)	0.25	18.9	45.00
6	79.47	10.05	4.147	0.30(0.08)	0.25	19.0	55.00
7	79.98	10.24	4.103	0.30(0.08)	0.25	19.3	59.00
8	80.45	10.42	4.062	0.30(0.08)	0.25	19.7	30.00
9	80.60	10.49	4.046	0.30(0.08)	0.25	19.8	63.00
10	81.14	10.79	3.983	0.30(0.07)	0.25	20.3	60.00
11	81.36	10.90	3.958	0.30(0.07)	0.25	20.5	38.00
12	82.05	11.29	3.880	0.30(0.07)	0.24	21.2	30.00
13	82.22	11.41	3.857	0.30(0.07)	0.24	21.3	36.00
14	82.95	11.96	3.754	0.30(0.07)	0.24	22.2	14.00
15	83.38	12.25	3.702	0.30(0.07)	0.24	22.7	26.00
16	83.46	12.32	3.691	0.30(0.07)	0.24	22.8	27.00
17	83.77	12.59	3.644	0.30(0.07)	0.24	23.2	38.00
18	84.14	12.98	3.581	0.30(0.07)	0.24	23.9	20.00
19	84.38	13.45	3.509	0.30(0.07)	0.24	24.5	17.00
20	84.41	13.53	3.498	0.30(0.07)	0.24	24.6	23.00
21	84.42	13.55	3.494	0.30(0.07)	0.24	24.6	29.00
22	84.51	14.62	3.346	0.30(0.07)	0.24	25.9	50.00
23	84.19	14.89	3.311	0.30(0.07)	0.23	26.1	39.00
24	83.99	15.00	3.297	0.30(0.07)	0.23	26.2	34.00
25	83.56	15.24	3.267	0.30(0.07)	0.23	26.3	24.00
26	78.86	17.95	2.975	0.30(0.07)	0.23	27.6	12.00
27	73.94	21.20	2.704	0.30(0.07)	0.22	29.0	64.00
28	73.74	21.33	2.695	0.30(0.07)	0.22	29.0	10.00
29	73.44	21.56	2.678	0.30(0.07)	0.22	29.1	32.00

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      84.51    Tc(MIN.) =    14.62
  EFFECTIVE AREA(ACRES) =      25.94   AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.24
  TOTAL AREA(ACRES) =       29.1
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     57.00 =    2385.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     67.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   149.10  DOWNSTREAM(FEET) =   148.50
  FLOW LENGTH(FEET) =   275.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  54.0 INCH PIPE IS  41.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.40
  ESTIMATED PIPE DIAMETER(INCH) =  54.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      84.51
  PIPE TRAVEL TIME(MIN.) =   0.72    Tc(MIN.) =   15.33
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     67.00 =    2660.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     67.00 TO NODE     67.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     68.00 TO NODE     69.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   365.00
  ELEVATION DATA: UPSTREAM(FEET) =    168.20  DOWNSTREAM(FEET) =    167.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.404
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.858
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  APARTMENTS                 B        1.00      0.30      0.200    76   11.40
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      3.42
  TOTAL AREA(ACRES) =      1.00   PEAK FLOW RATE(CFS) =      3.42

****************************************************************************
  FLOW PROCESS FROM NODE     69.00 TO NODE     70.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   162.00  DOWNSTREAM(FEET) =   159.00
  FLOW LENGTH(FEET) =   185.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.21
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.42
  PIPE TRAVEL TIME(MIN.) =   0.50    Tc(MIN.) =   11.90
  LONGEST FLOWPATH FROM NODE     68.00 TO NODE     70.00 =     550.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     71.00 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.) =   11.90
  RAINFALL INTENSITY(INCH/HR) =   3.76
  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       1.00
  TOTAL STREAM AREA(ACRES) =       1.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       3.42

****************************************************************************
  FLOW PROCESS FROM NODE     71.00 TO NODE     70.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==========================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   250.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.20  DOWNSTREAM(FEET) =    166.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.688
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.004
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  APARTMENTS                 B        0.66      0.30     0.200    76   10.69
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      2.34
  TOTAL AREA(ACRES) =      0.66   PEAK FLOW RATE(CFS) =      2.34

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     70.00 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.) =   10.69
 RAINFALL INTENSITY(INCH/HR) =   4.00
 AREA-AVERAGED Fm(INCH/HR) =  0.06
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.20
 EFFECTIVE STREAM AREA(ACRES) =       0.66
 TOTAL STREAM AREA(ACRES) =       0.66
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.34

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        3.42   11.90    3.764  0.30( 0.06) 0.20       1.0      68.00
     2        2.34   10.69    4.004  0.30( 0.06) 0.20       0.7      71.00

 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        5.61   10.69    4.004  0.30( 0.06) 0.20       1.6      71.00
     2        5.62   11.90    3.764  0.30( 0.06) 0.20       1.7      68.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       5.62    Tc(MIN.) =    11.90
 EFFECTIVE AREA(ACRES) =       1.66   AREA-AVERAGED Fm(INCH/HR) =  0.06
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.20
 TOTAL AREA(ACRES) =        1.7
 LONGEST FLOWPATH FROM NODE     68.00 TO NODE     70.00 =     550.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE     70.00 TO NODE     70.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE     72.00 TO NODE     73.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   230.00
 ELEVATION DATA: UPSTREAM(FEET) =    168.00  DOWNSTREAM(FEET) =    166.80

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

```
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    8.161
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.673
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE           GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  APARTMENTS                B        0.28      0.30      0.200    76    8.16
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      1.16
  TOTAL AREA(ACRES) =      0.28   PEAK FLOW RATE(CFS) =      1.16

****************************************************************************
  FLOW PROCESS FROM NODE     73.00 TO NODE     70.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   160.00  DOWNSTREAM(FEET) =   159.00
  FLOW LENGTH(FEET) =   270.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.76
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.16
  PIPE TRAVEL TIME(MIN.) =   1.63    Tc(MIN.) =    9.79
  LONGEST FLOWPATH FROM NODE     72.00 TO NODE     70.00 =     500.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     70.00 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.) =    9.79
  RAINFALL INTENSITY(INCH/HR) =   4.21
  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       0.28
  TOTAL STREAM AREA(ACRES) =       0.28
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.16

****************************************************************************
  FLOW PROCESS FROM NODE     72.00 TO NODE     70.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   390.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.20  DOWNSTREAM(FEET) =    166.80

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   13.956
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.436
```

```
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  APARTMENTS                 B        1.49      0.30      0.200    76   13.96
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.200
  SUBAREA RUNOFF(CFS) =      4.53
  TOTAL AREA(ACRES) =      1.49   PEAK FLOW RATE(CFS) =      4.53

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     70.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.96
  RAINFALL INTENSITY(INCH/HR) =   3.44
  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.20
  EFFECTIVE STREAM AREA(ACRES) =       1.49
  TOTAL STREAM AREA(ACRES) =       1.49
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       4.53

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        1.16    9.79    4.210  0.30( 0.06) 0.20       0.3      72.00
      2        4.53   13.96    3.436  0.30( 0.06) 0.20       1.5      72.00

  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        5.07    9.79    4.210  0.30( 0.06) 0.20       1.3      72.00
      2        5.47   13.96    3.436  0.30( 0.06) 0.20       1.8      72.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       5.47    Tc(MIN.) =    13.96
  EFFECTIVE AREA(ACRES) =       1.77   AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.20
  TOTAL AREA(ACRES) =        1.8
  LONGEST FLOWPATH FROM NODE     72.00 TO NODE     70.00 =     500.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     70.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 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        5.07    9.79    4.210  0.30( 0.06) 0.20       1.3      72.00
      2        5.47   13.96    3.436  0.30( 0.06) 0.20       1.8      72.00
  LONGEST FLOWPATH FROM NODE     72.00 TO NODE     70.00 =     500.00 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1        5.61   10.69    4.004  0.30( 0.06) 0.20       1.6      71.00
      2        5.62   11.90    3.764  0.30( 0.06) 0.20       1.7      68.00
  LONGEST FLOWPATH FROM NODE     68.00 TO NODE     70.00 =     550.00 FEET.

  ** PEAK FLOW RATE TABLE **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)         (ACRES)    NODE
      1       10.47    9.79    4.210  0.30( 0.06) 0.20       2.8      72.00
      2       10.76   10.69    4.004  0.30( 0.06) 0.20       3.0      71.00
      3       10.89   11.90    3.764  0.30( 0.06) 0.20       3.2      68.00
      4       10.59   13.96    3.436  0.30( 0.06) 0.20       3.4      72.00
    TOTAL AREA(ACRES) =          3.4

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       10.89  Tc(MIN.) =   11.901
  EFFECTIVE AREA(ACRES) =      3.21  AREA-AVERAGED Fm(INCH/HR) =  0.06
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.20
  TOTAL AREA(ACRES) =        3.4
  LONGEST FLOWPATH FROM NODE     68.00 TO NODE     70.00 =     550.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     70.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     67.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   155.00  DOWNSTREAM(FEET) =   148.50
  FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  22.08
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.89
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =   11.92
  LONGEST FLOWPATH FROM NODE     68.00 TO NODE     67.00 =     580.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     67.00 TO NODE     67.00 IS CODE =  11
----------------------------------------------------------------------------
```

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

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	10.47	9.81	4.204	0.30(0.06)	0.20	2.8	72.00
2	10.76	10.71	3.999	0.30(0.06)	0.20	3.0	71.00
3	10.89	11.92	3.760	0.30(0.06)	0.20	3.2	68.00
4	10.59	13.98	3.433	0.30(0.06)	0.20	3.4	72.00

LONGEST FLOWPATH FROM NODE 68.00 TO NODE 67.00 = 580.00 FEET.

** MEMORY BANK # 1 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	73.44	9.03	4.410	0.30(0.08)	0.25	15.6	65.00
2	77.90	10.30	4.090	0.30(0.08)	0.25	18.0	51.00
3	78.85	10.57	4.028	0.30(0.08)	0.25	18.6	58.00
4	79.00	10.62	4.018	0.30(0.08)	0.25	18.7	43.00
5	79.44	10.76	3.988	0.30(0.08)	0.25	18.9	45.00
6	79.47	10.77	3.986	0.30(0.08)	0.25	19.0	55.00
7	79.98	10.96	3.947	0.30(0.08)	0.25	19.3	59.00
8	80.45	11.14	3.909	0.30(0.08)	0.25	19.7	30.00
9	80.60	11.21	3.895	0.30(0.08)	0.25	19.8	63.00
10	81.14	11.50	3.838	0.30(0.07)	0.25	20.3	60.00
11	81.36	11.62	3.816	0.30(0.07)	0.25	20.5	38.00
12	82.05	12.01	3.745	0.30(0.07)	0.24	21.2	30.00
13	82.22	12.13	3.724	0.30(0.07)	0.24	21.3	36.00
14	82.95	12.68	3.631	0.30(0.07)	0.24	22.2	14.00
15	83.38	12.97	3.583	0.30(0.07)	0.24	22.7	26.00
16	83.46	13.04	3.573	0.30(0.07)	0.24	22.8	27.00
17	83.77	13.31	3.530	0.30(0.07)	0.24	23.2	38.00
18	84.14	13.70	3.473	0.30(0.07)	0.24	23.9	20.00
19	84.38	14.17	3.406	0.30(0.07)	0.24	24.5	17.00
20	84.41	14.24	3.396	0.30(0.07)	0.24	24.6	23.00
21	84.42	14.27	3.392	0.30(0.07)	0.24	24.6	29.00
22	84.51	15.33	3.256	0.30(0.07)	0.24	25.9	50.00
23	84.19	15.60	3.223	0.30(0.07)	0.23	26.1	39.00
24	83.99	15.72	3.210	0.30(0.07)	0.23	26.2	34.00
25	83.56	15.96	3.182	0.30(0.07)	0.23	26.3	24.00
26	78.86	18.67	2.908	0.30(0.07)	0.23	27.6	12.00
27	73.94	21.94	2.651	0.30(0.07)	0.22	29.0	64.00
28	73.74	22.07	2.642	0.30(0.07)	0.22	29.0	10.00
29	73.44	22.30	2.627	0.30(0.07)	0.22	29.1	32.00

LONGEST FLOWPATH FROM NODE 10.00 TO NODE 67.00 = 2660.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	83.56	9.03	4.410	0.30(0.07)	0.24	18.1	65.00
2	86.68	9.81	4.204	0.30(0.07)	0.24	19.8	72.00
3	88.53	10.30	4.090	0.30(0.07)	0.24	20.9	51.00
4	89.57	10.57	4.028	0.30(0.07)	0.24	21.5	58.00
5	89.74	10.62	4.018	0.30(0.07)	0.24	21.6	43.00

```
      6       90.04   10.71    3.999  0.30( 0.07) 0.24      21.8      71.00
      7       90.21   10.76    3.988  0.30( 0.07) 0.24      21.9      45.00
      8       90.24   10.77    3.986  0.30( 0.07) 0.24      21.9      55.00
      9       90.77   10.96    3.947  0.30( 0.07) 0.24      22.3      59.00
     10       91.26   11.14    3.909  0.30( 0.07) 0.24      22.7      30.00
     11       91.42   11.21    3.895  0.30( 0.07) 0.24      22.9      63.00
     12       91.99   11.50    3.838  0.30( 0.07) 0.24      23.4      60.00
     13       92.22   11.62    3.816  0.30( 0.07) 0.24      23.6      38.00
     14       92.79   11.92    3.760  0.30( 0.07) 0.24      24.2      68.00
     15       92.93   12.01    3.745  0.30( 0.07) 0.24      24.4      30.00
     16       93.08   12.13    3.724  0.30( 0.07) 0.24      24.6      36.00
     17       93.73   12.68    3.631  0.30( 0.07) 0.24      25.5      14.00
     18       94.11   12.97    3.583  0.30( 0.07) 0.24      26.0      26.00
     19       94.19   13.04    3.573  0.30( 0.07) 0.24      26.1      27.00
     20       94.45   13.31    3.530  0.30( 0.07) 0.24      26.6      38.00
     21       94.77   13.70    3.473  0.30( 0.07) 0.24      27.3      20.00
     22       94.88   13.98    3.433  0.30( 0.07) 0.23      27.7      72.00
     23       94.89   14.17    3.406  0.30( 0.07) 0.23      27.9      17.00
     24       94.89   14.24    3.396  0.30( 0.07) 0.23      28.0      23.00
     25       94.89   14.27    3.392  0.30( 0.07) 0.23      28.1      29.00
     26       94.55   15.33    3.256  0.30( 0.07) 0.23      29.4      50.00
     27       94.13   15.60    3.223  0.30( 0.07) 0.23      29.6      39.00
     28       93.89   15.72    3.210  0.30( 0.07) 0.23      29.6      34.00
     29       93.37   15.96    3.182  0.30( 0.07) 0.23      29.8      24.00
     30       87.81   18.67    2.908  0.30( 0.07) 0.23      31.1      12.00
     31       82.07   21.94    2.651  0.30( 0.07) 0.22      32.4      64.00
     32       81.85   22.07    2.642  0.30( 0.07) 0.22      32.4      10.00
     33       81.51   22.30    2.627  0.30( 0.07) 0.22      32.5      32.00
   TOTAL AREA(ACRES) =        32.5

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       94.89  Tc(MIN.) =   14.242
  EFFECTIVE AREA(ACRES) =     28.04  AREA-AVERAGED Fm(INCH/HR) =  0.07
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.23
  TOTAL AREA(ACRES) =       32.5
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     67.00 =    2660.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     67.00 TO NODE     74.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   148.50  DOWNSTREAM(FEET) =   148.00
  FLOW LENGTH(FEET) =   280.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  60.0 INCH PIPE IS  43.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.17
  ESTIMATED PIPE DIAMETER(INCH) =  60.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      94.89
  PIPE TRAVEL TIME(MIN.) =   0.76    Tc(MIN.) =   15.00
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     74.00 =    2940.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     74.00 TO NODE     74.00 IS CODE =  10
```

```
------------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
==============================================================================

******************************************************************************
  FLOW PROCESS FROM NODE     75.00 TO NODE     76.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   275.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.00  DOWNSTREAM(FEET) =    165.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.415
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.305
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.70      0.30     0.350    76    9.41
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      2.65
  TOTAL AREA(ACRES) =      0.70   PEAK FLOW RATE(CFS) =      2.65

******************************************************************************
  FLOW PROCESS FROM NODE     76.00 TO NODE     76.00 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.) =    9.41
  RAINFALL INTENSITY(INCH/HR) =   4.31
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.70
  TOTAL STREAM AREA(ACRES) =       0.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.65

******************************************************************************
  FLOW PROCESS FROM NODE     77.00 TO NODE     76.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   255.00
  ELEVATION DATA: UPSTREAM(FEET) =    167.00  DOWNSTREAM(FEET) =    166.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   10.745
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.991
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
```

```
   DEVELOPMENT TYPE/       SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE             GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS                B        0.51      0.30      0.350    76   10.75
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.78
  TOTAL AREA(ACRES) =      0.51   PEAK FLOW RATE(CFS) =      1.78

****************************************************************************
  FLOW PROCESS FROM NODE     76.00 TO NODE     76.00 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.) =   10.75
  RAINFALL INTENSITY(INCH/HR) =   3.99
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.51
  TOTAL STREAM AREA(ACRES) =       0.51
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.78

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)  (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        2.65    9.41    4.305  0.30( 0.11) 0.35       0.7      75.00
      2        1.78   10.75    3.991  0.30( 0.11) 0.35       0.5      77.00

  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        4.34    9.41    4.305  0.30( 0.11) 0.35       1.1      75.00
      2        4.23   10.75    3.991  0.30( 0.10) 0.35       1.2      77.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       4.34    Tc(MIN.) =     9.41
  EFFECTIVE AREA(ACRES) =       1.15   AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        1.2
  LONGEST FLOWPATH FROM NODE     75.00 TO NODE     76.00 =     275.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     76.00 TO NODE     79.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   154.00  DOWNSTREAM(FEET) =   152.00
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```
  FLOW LENGTH(FEET) =   300.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS  10.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.70
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.34
  PIPE TRAVEL TIME(MIN.) =   1.06    Tc(MIN.) =   10.48
  LONGEST FLOWPATH FROM NODE     75.00 TO NODE     79.00 =     575.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     79.00 TO NODE     79.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.48
  RAINFALL INTENSITY(INCH/HR) =   4.05
  AREA-AVERAGED Fm(INCH/HR) =  0.10
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       1.15
  TOTAL STREAM AREA(ACRES) =       1.21
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       4.34

****************************************************************************
  FLOW PROCESS FROM NODE     78.00 TO NODE     79.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   200.00
  ELEVATION DATA: UPSTREAM(FEET) =    165.90  DOWNSTREAM(FEET) =    165.30

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.578
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.263
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  CONDOMINIUMS               B        0.40      0.30      0.350    76    9.58
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
  SUBAREA RUNOFF(CFS) =      1.50
  TOTAL AREA(ACRES) =      0.40   PEAK FLOW RATE(CFS) =      1.50

****************************************************************************
  FLOW PROCESS FROM NODE     79.00 TO NODE     79.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.58
```

```
  RAINFALL INTENSITY(INCH/HR) =   4.26
  AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.35
  EFFECTIVE STREAM AREA(ACRES) =       0.40
  TOTAL STREAM AREA(ACRES) =       0.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.50

  ** CONFLUENCE DATA **
   STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
   NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
      1        4.34   10.48    4.049  0.30( 0.11) 0.35       1.1      75.00
      1        4.23   11.81    3.780  0.30( 0.10) 0.35       1.2      77.00
      2        1.50    9.58    4.263  0.30( 0.11) 0.35       0.4      78.00

  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        5.67    9.58    4.263  0.30( 0.10) 0.35       1.4      78.00
      2        5.76   10.48    4.049  0.30( 0.11) 0.35       1.5      75.00
      3        5.56   11.81    3.780  0.30( 0.10) 0.35       1.6      77.00

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       5.76    Tc(MIN.) =    10.48
  EFFECTIVE AREA(ACRES) =       1.55   AREA-AVERAGED Fm(INCH/HR) =  0.11
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.35
  TOTAL AREA(ACRES) =        1.6
  LONGEST FLOWPATH FROM NODE     75.00 TO NODE     79.00 =     575.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     79.00 TO NODE     74.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   152.00  DOWNSTREAM(FEET) =   148.00
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.99
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.76
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =   10.54
  LONGEST FLOWPATH FROM NODE     75.00 TO NODE     74.00 =     625.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     74.00 TO NODE     74.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
```

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	5.67	9.64	4.247	0.30(0.10)	0.35	1.4	78.00
2	5.76	10.54	4.035	0.30(0.11)	0.35	1.5	75.00
3	5.56	11.88	3.768	0.30(0.10)	0.35	1.6	77.00

LONGEST FLOWPATH FROM NODE 75.00 TO NODE 74.00 = 625.00 FEET.

** MEMORY BANK # 3 CONFLUENCE DATA **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	83.56	9.81	4.205	0.30(0.07)	0.24	18.1	65.00
2	86.68	10.59	4.024	0.30(0.07)	0.24	19.8	72.00
3	88.53	11.07	3.923	0.30(0.07)	0.24	20.9	51.00
4	89.57	11.35	3.868	0.30(0.07)	0.24	21.5	58.00
5	89.74	11.40	3.859	0.30(0.07)	0.24	21.6	43.00
6	90.04	11.49	3.842	0.30(0.07)	0.24	21.8	71.00
7	90.21	11.54	3.832	0.30(0.07)	0.24	21.9	45.00
8	90.24	11.55	3.830	0.30(0.07)	0.24	21.9	55.00
9	90.77	11.73	3.795	0.30(0.07)	0.24	22.3	59.00
10	91.26	11.92	3.761	0.30(0.07)	0.24	22.7	30.00
11	91.42	11.99	3.749	0.30(0.07)	0.24	22.9	63.00
12	91.99	12.28	3.697	0.30(0.07)	0.24	23.4	60.00
13	92.22	12.40	3.677	0.30(0.07)	0.24	23.6	38.00
14	92.79	12.70	3.627	0.30(0.07)	0.24	24.2	68.00
15	92.93	12.78	3.613	0.30(0.07)	0.24	24.4	30.00
16	93.08	12.90	3.594	0.30(0.07)	0.24	24.6	36.00
17	93.73	13.44	3.512	0.30(0.07)	0.24	25.5	14.00
18	94.11	13.73	3.469	0.30(0.07)	0.24	26.0	26.00
19	94.19	13.79	3.459	0.30(0.07)	0.24	26.1	27.00
20	94.45	14.07	3.420	0.30(0.07)	0.24	26.6	38.00
21	94.77	14.46	3.368	0.30(0.07)	0.24	27.3	20.00
22	94.88	14.74	3.331	0.30(0.07)	0.23	27.7	72.00
23	94.89	14.93	3.306	0.30(0.07)	0.23	27.9	17.00
24	94.89	15.00	3.297	0.30(0.07)	0.23	28.0	23.00
25	94.89	15.03	3.294	0.30(0.07)	0.23	28.1	29.00
26	94.55	16.09	3.167	0.30(0.07)	0.23	29.4	50.00
27	94.13	16.36	3.137	0.30(0.07)	0.23	29.6	39.00
28	93.89	16.47	3.125	0.30(0.07)	0.23	29.6	34.00
29	93.37	16.74	3.096	0.30(0.07)	0.23	29.8	24.00
30	87.81	19.45	2.841	0.30(0.07)	0.23	31.1	12.00
31	82.07	22.72	2.599	0.30(0.07)	0.22	32.4	64.00
32	81.85	22.86	2.590	0.30(0.07)	0.22	32.4	10.00
33	81.51	23.08	2.575	0.30(0.07)	0.22	32.5	32.00

LONGEST FLOWPATH FROM NODE 10.00 TO NODE 74.00 = 2940.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	Q (CFS)	Tc (MIN.)	Intensity (INCH/HR)	Fp(Fm) (INCH/HR)	Ap	Ae (ACRES)	HEADWATER NODE
1	88.63	9.64	4.247	0.30(0.08)	0.25	19.3	78.00
2	89.25	9.81	4.205	0.30(0.08)	0.25	19.6	65.00
3	92.23	10.54	4.035	0.30(0.08)	0.25	21.3	75.00
4	92.42	10.59	4.024	0.30(0.08)	0.25	21.4	72.00
5	94.20	11.07	3.923	0.30(0.08)	0.25	22.4	51.00
6	95.20	11.35	3.868	0.30(0.08)	0.25	23.1	58.00

7	95.36	11.40	3.859	0.30(0.08)	0.25	23.2	43.00
8	95.66	11.49	3.842	0.30(0.08)	0.25	23.4	71.00
9	95.82	11.54	3.832	0.30(0.08)	0.25	23.5	45.00
10	95.84	11.55	3.830	0.30(0.08)	0.25	23.5	55.00
11	96.35	11.73	3.795	0.30(0.08)	0.25	23.9	59.00
12	96.71	11.88	3.768	0.30(0.08)	0.25	24.2	77.00
13	96.80	11.92	3.761	0.30(0.08)	0.25	24.3	30.00
14	96.94	11.99	3.749	0.30(0.08)	0.25	24.5	63.00
15	97.44	12.28	3.697	0.30(0.07)	0.25	25.0	60.00
16	97.64	12.40	3.677	0.30(0.07)	0.25	25.3	38.00
17	98.13	12.70	3.627	0.30(0.07)	0.25	25.8	68.00
18	98.25	12.78	3.613	0.30(0.07)	0.25	26.0	30.00
19	98.37	12.90	3.594	0.30(0.07)	0.25	26.2	36.00
20	98.89	13.44	3.512	0.30(0.07)	0.24	27.1	14.00
21	99.22	13.73	3.469	0.30(0.07)	0.24	27.6	26.00
22	99.27	13.79	3.459	0.30(0.07)	0.24	27.7	27.00
23	99.48	14.07	3.420	0.30(0.07)	0.24	28.2	38.00
24	99.72	14.46	3.368	0.30(0.07)	0.24	28.9	20.00
25	99.77	14.74	3.331	0.30(0.07)	0.24	29.3	72.00
26	99.74	14.93	3.306	0.30(0.07)	0.24	29.6	17.00
27	99.73	15.00	3.297	0.30(0.07)	0.24	29.7	23.00
28	99.72	15.03	3.294	0.30(0.07)	0.24	29.7	29.00
29	99.20	16.09	3.167	0.30(0.07)	0.24	31.0	50.00
30	98.72	16.36	3.137	0.30(0.07)	0.24	31.2	39.00
31	98.47	16.47	3.125	0.30(0.07)	0.24	31.3	34.00
32	97.90	16.74	3.096	0.30(0.07)	0.24	31.4	24.00
33	91.96	19.45	2.841	0.30(0.07)	0.23	32.7	12.00
34	85.86	22.72	2.599	0.30(0.07)	0.23	34.0	64.00
35	85.62	22.86	2.590	0.30(0.07)	0.23	34.0	10.00
36	85.25	23.08	2.575	0.30(0.07)	0.23	34.1	32.00
TOTAL AREA(ACRES) =		34.1					

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 99.77 Tc(MIN.) = 14.736
EFFECTIVE AREA(ACRES) = 29.29 AREA-AVERAGED Fm(INCH/HR) = 0.07
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.24
TOTAL AREA(ACRES) = 34.1
LONGEST FLOWPATH FROM NODE 10.00 TO NODE 74.00 = 2940.00 FEET.

****
FLOW PROCESS FROM NODE 74.00 TO NODE 74.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 3 <<<<<
==

****
FLOW PROCESS FROM NODE 74.00 TO NODE 74.00 IS CODE = 1

>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 1 ARE:
TIME OF CONCENTRATION(MIN.) = 14.74
RAINFALL INTENSITY(INCH/HR) = 3.33

```
 AREA-AVERAGED Fm(INCH/HR) =  0.07
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.24
 EFFECTIVE STREAM AREA(ACRES) =      29.29
 TOTAL STREAM AREA(ACRES) =      34.13
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      99.77

****************************************************************************
 FLOW PROCESS FROM NODE     59.00 TO NODE     74.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
 ELEVATION DATA: UPSTREAM(FEET) =    166.80  DOWNSTREAM(FEET) =    165.00

 Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
 SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.807
 * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.206
 SUBAREA Tc AND LOSS RATE DATA(AMC III):
  DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
      LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
 CONDOMINIUMS               B        0.41      0.30     0.350    76    9.81
 SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
 SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.350
 SUBAREA RUNOFF(CFS) =      1.51
 TOTAL AREA(ACRES) =      0.41   PEAK FLOW RATE(CFS) =      1.51

****************************************************************************
 FLOW PROCESS FROM NODE     74.00 TO NODE     74.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.81
 RAINFALL INTENSITY(INCH/HR) =   4.21
 AREA-AVERAGED Fm(INCH/HR) =  0.11
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.35
 EFFECTIVE STREAM AREA(ACRES) =       0.41
 TOTAL STREAM AREA(ACRES) =       0.41
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       1.51

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)      Ap      Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1       88.63    9.64    4.247  0.30( 0.08) 0.25      19.3      78.00
     1       89.25    9.81    4.205  0.30( 0.08) 0.25      19.6      65.00
     1       92.23   10.54    4.035  0.30( 0.08) 0.25      21.3      75.00
     1       92.42   10.59    4.024  0.30( 0.08) 0.25      21.4      72.00
     1       94.20   11.07    3.923  0.30( 0.08) 0.25      22.4      51.00
     1       95.20   11.35    3.868  0.30( 0.08) 0.25      23.1      58.00
```

1	95.36	11.40	3.859	0.30(0.08)	0.25	23.2	43.00
1	95.66	11.49	3.842	0.30(0.08)	0.25	23.4	71.00
1	95.82	11.54	3.832	0.30(0.08)	0.25	23.5	45.00
1	95.84	11.55	3.830	0.30(0.08)	0.25	23.5	55.00
1	96.35	11.73	3.795	0.30(0.08)	0.25	23.9	59.00
1	96.71	11.88	3.768	0.30(0.08)	0.25	24.2	77.00
1	96.80	11.92	3.761	0.30(0.08)	0.25	24.3	30.00
1	96.94	11.99	3.749	0.30(0.08)	0.25	24.5	63.00
1	97.44	12.28	3.697	0.30(0.07)	0.25	25.0	60.00
1	97.64	12.40	3.677	0.30(0.07)	0.25	25.3	38.00
1	98.13	12.70	3.627	0.30(0.07)	0.25	25.8	68.00
1	98.25	12.78	3.613	0.30(0.07)	0.25	26.0	30.00
1	98.37	12.90	3.594	0.30(0.07)	0.25	26.2	36.00
1	98.89	13.44	3.512	0.30(0.07)	0.24	27.1	14.00
1	99.22	13.73	3.469	0.30(0.07)	0.24	27.6	26.00
1	99.27	13.79	3.459	0.30(0.07)	0.24	27.7	27.00
1	99.48	14.07	3.420	0.30(0.07)	0.24	28.2	38.00
1	99.72	14.46	3.368	0.30(0.07)	0.24	28.9	20.00
1	99.77	14.74	3.331	0.30(0.07)	0.24	29.3	72.00
1	99.74	14.93	3.306	0.30(0.07)	0.24	29.6	17.00
1	99.73	15.00	3.297	0.30(0.07)	0.24	29.7	23.00
1	99.72	15.03	3.294	0.30(0.07)	0.24	29.7	29.00
1	99.20	16.09	3.167	0.30(0.07)	0.24	31.0	50.00
1	98.72	16.36	3.137	0.30(0.07)	0.24	31.2	39.00
1	98.47	16.47	3.125	0.30(0.07)	0.24	31.3	34.00
1	97.90	16.74	3.096	0.30(0.07)	0.24	31.4	24.00
1	91.96	19.45	2.841	0.30(0.07)	0.23	32.7	12.00
1	85.86	22.72	2.599	0.30(0.07)	0.23	34.0	64.00
1	85.62	22.86	2.590	0.30(0.07)	0.23	34.0	10.00
1	85.25	23.08	2.575	0.30(0.07)	0.23	34.1	32.00
2	1.51	9.81	4.206	0.30(0.11)	0.35	0.4	59.00

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	90.14	9.64	4.247	0.30(0.08)	0.25	19.7	78.00
2	90.75	9.81	4.206	0.30(0.08)	0.25	20.0	59.00
3	90.76	9.81	4.205	0.30(0.08)	0.25	20.0	65.00
4	93.68	10.54	4.035	0.30(0.08)	0.25	21.7	75.00
5	93.87	10.59	4.024	0.30(0.08)	0.25	21.8	72.00
6	95.61	11.07	3.923	0.30(0.08)	0.25	22.9	51.00
7	96.59	11.35	3.868	0.30(0.08)	0.25	23.5	58.00
8	96.75	11.40	3.859	0.30(0.08)	0.25	23.6	43.00
9	97.04	11.49	3.842	0.30(0.08)	0.25	23.8	71.00
10	97.19	11.54	3.832	0.30(0.08)	0.25	23.9	45.00
11	97.22	11.55	3.830	0.30(0.08)	0.25	24.0	55.00
12	97.71	11.73	3.795	0.30(0.08)	0.25	24.4	59.00
13	98.06	11.88	3.768	0.30(0.08)	0.25	24.7	77.00
14	98.15	11.92	3.761	0.30(0.08)	0.25	24.7	30.00
15	98.29	11.99	3.749	0.30(0.08)	0.25	24.9	63.00
16	98.76	12.28	3.697	0.30(0.08)	0.25	25.4	60.00

17	98.95	12.40	3.677	0.30(0.08)	0.25	25.7	38.00
18	99.43	12.70	3.627	0.30(0.08)	0.25	26.2	68.00
19	99.54	12.78	3.613	0.30(0.08)	0.25	26.4	30.00
20	99.66	12.90	3.594	0.30(0.08)	0.25	26.6	36.00
21	100.15	13.44	3.512	0.30(0.07)	0.25	27.5	14.00
22	100.46	13.73	3.469	0.30(0.07)	0.25	28.0	26.00
23	100.51	13.79	3.459	0.30(0.07)	0.24	28.2	27.00
24	100.71	14.07	3.420	0.30(0.07)	0.24	28.6	38.00
25	100.92	14.46	3.368	0.30(0.07)	0.24	29.3	20.00
26	100.96	14.74	3.331	0.30(0.07)	0.24	29.7	72.00
27	100.93	14.93	3.306	0.30(0.07)	0.24	30.0	17.00
28	100.91	15.00	3.297	0.30(0.07)	0.24	30.1	23.00
29	100.90	15.03	3.294	0.30(0.07)	0.24	30.1	29.00
30	100.33	16.09	3.167	0.30(0.07)	0.24	31.4	50.00
31	99.84	16.36	3.137	0.30(0.07)	0.24	31.6	39.00
32	99.58	16.47	3.125	0.30(0.07)	0.24	31.7	34.00
33	99.01	16.74	3.096	0.30(0.07)	0.24	31.8	24.00
34	92.97	19.45	2.841	0.30(0.07)	0.23	33.1	12.00
35	86.78	22.72	2.599	0.30(0.07)	0.23	34.4	64.00
36	86.53	22.86	2.590	0.30(0.07)	0.23	34.5	10.00
37	86.16	23.08	2.575	0.30(0.07)	0.23	34.5	32.00

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 100.96 Tc(MIN.) = 14.74
EFFECTIVE AREA(ACRES) = 29.70 AREA-AVERAGED Fm(INCH/HR) = 0.07
AREA-AVERAGED Fp(INCH/HR) = 0.30 AREA-AVERAGED Ap = 0.24
TOTAL AREA(ACRES) = 34.5
LONGEST FLOWPATH FROM NODE 10.00 TO NODE 74.00 = 2940.00 FEET.

****
FLOW PROCESS FROM NODE 80.00 TO NODE 81.00 IS CODE = 21

>>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
>>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
==
INITIAL SUBAREA FLOW-LENGTH(FEET) = 290.00
ELEVATION DATA: UPSTREAM(FEET) = 166.40 DOWNSTREAM(FEET) = 165.90

Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) = 10.484
* 100 YEAR RAINFALL INTENSITY(INCH/HR) = 4.048
SUBAREA Tc AND LOSS RATE DATA(AMC III):

DEVELOPMENT TYPE/ LAND USE	SCS SOIL GROUP	AREA (ACRES)	Fp (INCH/HR)	Ap (DECIMAL)	SCS CN	Tc (MIN.)
COMMERCIAL	B	0.76	0.30	0.100	76	10.48

SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) = 0.30
SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap = 0.100
SUBAREA RUNOFF(CFS) = 2.75
TOTAL AREA(ACRES) = 0.76 PEAK FLOW RATE(CFS) = 2.75

****
FLOW PROCESS FROM NODE 81.00 TO NODE 82.00 IS CODE = 31

>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   153.00  DOWNSTREAM(FEET) =   147.60
  FLOW LENGTH(FEET) =   320.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.03
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.75
  PIPE TRAVEL TIME(MIN.) =   0.89    Tc(MIN.) =   11.37
  LONGEST FLOWPATH FROM NODE     80.00 TO NODE     82.00 =     610.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     82.00 TO NODE     82.00 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.) =   11.37
  RAINFALL INTENSITY(INCH/HR) =   3.86
  AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30
  AREA-AVERAGED Ap =  0.10
  EFFECTIVE STREAM AREA(ACRES) =       0.76
  TOTAL STREAM AREA(ACRES) =       0.76
  PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.75

****************************************************************************
  FLOW PROCESS FROM NODE     81.00 TO NODE     82.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
============================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   320.00
  ELEVATION DATA: UPSTREAM(FEET) =    165.90  DOWNSTREAM(FEET) =    165.40

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =   11.122
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.913
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap      SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        0.59      0.30      0.100    76   11.12
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      2.06
  TOTAL AREA(ACRES) =      0.59   PEAK FLOW RATE(CFS) =      2.06

****************************************************************************
  FLOW PROCESS FROM NODE     82.00 TO NODE     82.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
```

```
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   11.12
 RAINFALL INTENSITY(INCH/HR) =   3.91
 AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30
 AREA-AVERAGED Ap =  0.10
 EFFECTIVE STREAM AREA(ACRES) =       0.59
 TOTAL STREAM AREA(ACRES) =       0.59
 PEAK FLOW RATE(CFS) AT CONFLUENCE =       2.06

 ** CONFLUENCE DATA **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        2.75   11.37    3.864  0.30( 0.03) 0.10       0.8      80.00
     2        2.06   11.12    3.913  0.30( 0.03) 0.10       0.6      81.00

 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        4.79   11.12    3.913  0.30( 0.03) 0.10       1.3      81.00
     2        4.78   11.37    3.864  0.30( 0.03) 0.10       1.3      80.00

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       4.79    Tc(MIN.) =    11.12
 EFFECTIVE AREA(ACRES) =       1.33   AREA-AVERAGED Fm(INCH/HR) =  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
 TOTAL AREA(ACRES) =        1.3
 LONGEST FLOWPATH FROM NODE     80.00 TO NODE     82.00 =     610.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =        1.3  TC(MIN.) =     11.12
 EFFECTIVE AREA(ACRES) =      1.33  AREA-AVERAGED Fm(INCH/HR)=  0.03
 AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.100
 PEAK FLOW RATE(CFS)   =       4.79

 ** PEAK FLOW RATE TABLE **
  STREAM       Q      Tc   Intensity   Fp(Fm)     Ap     Ae     HEADWATER
  NUMBER     (CFS)   (MIN.) (INCH/HR) (INCH/HR)          (ACRES)    NODE
     1        4.79   11.12    3.913  0.30( 0.03) 0.10       1.3      81.00
     2        4.78   11.37    3.864  0.30( 0.03) 0.10       1.3      80.00
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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_____________________________________________________________________________
*****************************************************************************
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                              Analysis prepared by:

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 ************************** DESCRIPTION OF STUDY **************************
* SOUTH STREET ANALYSIS                                                   *
* 100 YEAR                                                                *
*                                                                         *
 *************************************************************************

  FILE NAME: FRS100.DAT
  TIME/DATE OF STUDY: 13:14 07/23/2017
=============================================================================
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
=============================================================================
                     --*TIME-OF-CONCENTRATION MODEL*--

  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =  12.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  *DATA BANK RAINFALL USED*
  *ANTECEDENT MOISTURE CONDITION (AMC) III ASSUMED FOR RATIONAL METHOD*

  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  ========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.67 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

*****************************************************************************
  FLOW PROCESS FROM NODE     10.00 TO NODE     11.00 IS CODE =  21
-----------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   310.00
  ELEVATION DATA: UPSTREAM(FEET) =    168.00  DOWNSTREAM(FEET) =    167.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.499
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.283
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        1.43      0.30     0.100    76    9.50
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      5.47
  TOTAL AREA(ACRES) =      1.43   PEAK FLOW RATE(CFS) =      5.47

********************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     12.00 IS CODE =  62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =  167.00  DOWNSTREAM ELEVATION(FEET) =  165.80
  STREET LENGTH(FEET) =   360.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  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) =      10.65
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.59
    HALFSTREET FLOOD WIDTH(FEET) =   23.71
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.04
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.20
  STREET FLOW TRAVEL TIME(MIN.) =   2.94   Tc(MIN.) =   12.44
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.671
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        3.15      0.30     0.100    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    3.15      SUBAREA RUNOFF(CFS) =   10.32
  EFFECTIVE AREA(ACRES) =      4.58    AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
```

```
  TOTAL AREA(ACRES) =        4.6        PEAK FLOW RATE(CFS) =      15.01

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.65   HALFSTREET FLOOD WIDTH(FEET) =  27.07
  FLOW VELOCITY(FEET/SEC.) =  2.23   DEPTH*VELOCITY(FT*FT/SEC.) =   1.44
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     12.00 =     670.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE     13.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  165.80  DOWNSTREAM ELEVATION(FEET) =  164.00
  STREET LENGTH(FEET) =   265.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

  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) =      15.30
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.59
    HALFSTREET FLOOD WIDTH(FEET) =   23.71
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.93
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.72
  STREET FLOW TRAVEL TIME(MIN.) =   1.51   Tc(MIN.) =   13.94
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.438
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        0.19      0.30     0.100    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    0.19      SUBAREA RUNOFF(CFS) =    0.58
  EFFECTIVE AREA(ACRES) =      4.77    AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        4.8        PEAK FLOW RATE(CFS) =      15.01

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.58   HALFSTREET FLOOD WIDTH(FEET) =  23.55
  FLOW VELOCITY(FEET/SEC.) =  2.91   DEPTH*VELOCITY(FT*FT/SEC.) =   1.70
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     13.00 =     935.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     14.00 TO NODE     15.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
  >>USE TIME-OF-CONCENTRATION NOMOGRAPH FOR INITIAL SUBAREA<<
================================================================================
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   270.00
  ELEVATION DATA: UPSTREAM(FEET) =    166.60  DOWNSTREAM(FEET) =    166.00

  Tc = K*[(LENGTH** 3.00)/(ELEVATION CHANGE)]**0.20
  SUBAREA ANALYSIS USED MINIMUM Tc(MIN.) =    9.684
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  4.236
  SUBAREA Tc AND LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS   Tc
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN  (MIN.)
  COMMERCIAL                 B        0.92      0.30     0.100    76    9.68
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA RUNOFF(CFS) =      3.48
  TOTAL AREA(ACRES) =      0.92   PEAK FLOW RATE(CFS) =      3.48

********************************************************************************
  FLOW PROCESS FROM NODE     15.00 TO NODE     16.00 IS CODE =  62
--------------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) =  166.00  DOWNSTREAM ELEVATION(FEET) =  164.00
  STREET LENGTH(FEET) =   670.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

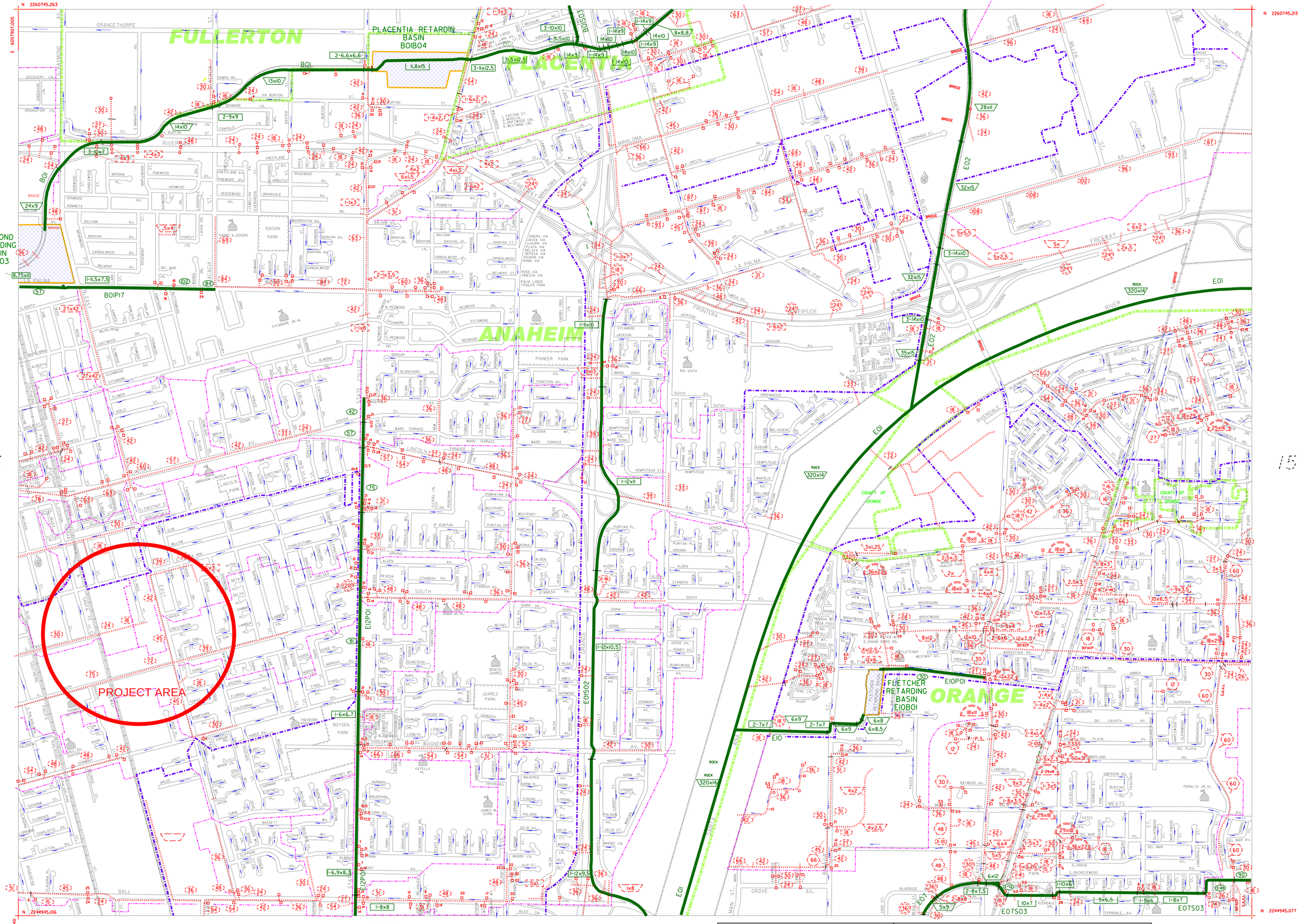
  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.29
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.53
    HALFSTREET FLOOD WIDTH(FEET) =   20.82
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.79
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.96
  STREET FLOW TRAVEL TIME(MIN.) =   6.22   Tc(MIN.) =   15.91
  * 100 YEAR RAINFALL INTENSITY(INCH/HR) =  3.188
  SUBAREA LOSS RATE DATA(AMC III):
   DEVELOPMENT TYPE/      SCS SOIL   AREA      Fp         Ap     SCS
       LAND USE            GROUP   (ACRES)  (INCH/HR)  (DECIMAL)  CN
  COMMERCIAL                 B        2.66      0.30     0.100    76
  SUBAREA AVERAGE PERVIOUS LOSS RATE, Fp(INCH/HR) =  0.30
  SUBAREA AVERAGE PERVIOUS AREA FRACTION, Ap =  0.100
  SUBAREA AREA(ACRES) =    2.66      SUBAREA RUNOFF(CFS) =    7.56
  EFFECTIVE AREA(ACRES) =      3.58    AREA-AVERAGED Fm(INCH/HR) =  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap =  0.10
  TOTAL AREA(ACRES) =        3.6        PEAK FLOW RATE(CFS) =      10.17
```

```
  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.59   HALFSTREET FLOOD WIDTH(FEET) =  23.79
  FLOW VELOCITY(FEET/SEC.) =  1.94   DEPTH*VELOCITY(FT*FT/SEC.) =   1.14
  LONGEST FLOWPATH FROM NODE     14.00 TO NODE     16.00 =     940.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        3.6  TC(MIN.) =     15.91
  EFFECTIVE AREA(ACRES) =      3.58  AREA-AVERAGED Fm(INCH/HR)=  0.03
  AREA-AVERAGED Fp(INCH/HR) =  0.30  AREA-AVERAGED Ap = 0.100
  PEAK FLOW RATE(CFS)   =      10.17
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

APPENDIX 4

OFF SITE DRAINAGE AREA EXHIBIT
(IN POCKET)



NOTICE

The drainage information has been prepared for information purposes only. The location, ownership, facility information and limits have been determined from available information provided by public agencies, but may not be exact, accurate, or up-to-date. The user of this information is responsible for verifying exact location, ownership, accuracy, and the regional versus local character of drainage facilities.

Additional information may be obtained from public plans and recorded deeds. Facility designations included with this information are for convenience only and are not controlling or intended to imply ownership by the County or the Orange County Flood Control District (OCFCD). The information is being provided as a courtesy and neither the County of Orange nor OCFCD assume any liabilities for inaccuracy of the information.

To notify OC Public Works Flood Control Section of additions or corrections, please contact Sal Gutierrez at (714) 834–5396 or by email at sal.gutierrez@ocpw.ocgov.com

N

0 200 400 600 800
FEET

ORANGE COUNTY FLOOD CONTROL DISTRICT

BASE MAP OF DRAINAGE FACILITIES IN ORANGE COUNTY

REVISION	DATE	SHEET NO.	DWG. NO.
S. GUTIERREZ	APR.27.2010	14	MAPS–113–3

- Channel Drainage Area Boundary
- Major Sub–Area Drainage Boundary
- Minor Sub–Area Drainage Boundary
- Existing O.C.F.C.D. Facility
- Existing Local Facility
- Existing Retarding Basin or Reservoir
- Natural Watercourse
- City Limits
- Greenbelt
- P.S. Pump Station
- Catch Basin (length in feet)
- Drop Inlet or Other Entry
- OCFCD Basins or Reservoirs

Ownership (If other than City or County): Private = P State = S Federal = F

EXISTING FACILITIES

O.C.F.C.D.	LOCAL	
		Earth Trapezoidal Channel (base width by height in feet)
		Reinforced Concrete Trapezoidal Channel (base width by height in feet)
		Reinforced Concrete Rectangular Channel (base width by height in feet)
		Reinforced Concrete Box (RCB) (number of barrels–span by height in feet)
		Reinforced Concrete Pipe (RCP) (diameter in inches)
		Metal Sheet Channel (MSC) (Base width by pile height in feet /Sheet pile total length)
		Corrugated Metal Pipe (CMP) (diameter in inches)
		Concrete Pipe (diameter in inches)
		Concrete Oval Pipe (width by height in inches)
		Steel Pipe (diameter in inches)
		Reinforced Concrete Arch (base span by height in inches)
		Corrugated Metal Arch (base span by height in inches)

APPENDIX 5

MASTER PLAN OF DRAINAGE

CITY OF ANAHEIM

Master Plan of Storm Drainage for Anaheim Barber City Channel Tributary Area

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JUNE 2009

6. Drainage Area 19

Drainage Area 19 drains approximately 643 acres, and is generally bounded by East Steet on the east, Ball Road and Vermont Avenue on the south, Union Pacific Railroad and Walnut Street on the west, with the northerly boundary of the Drainage Area meandering along Santa Ana Street, South Street, Lincoln Avenue, and Broadway. Generally, water flows over land and then through pipes from east to west and ties into the South Street storm drain flowing westerly across the I-5 Freeway which then joins the Walnut Street storm drain flowing south then Ball Road storm drain flowing west to the ABC Channel.

7.1 Hydrologic Analysis

The hydrologic analysis was performed for Drainage Area 19 in accordance with the criteria outlined in Chapter 3 and can be found in Appendix C. The hydrology map for Drainage Area 19 can be found in Appendix D. The following table shows the flow rates at the outlet of the Drainage Area for 10-, 25-, and 100-year storm events.

Table 7 – Drainage Area 19 Summary of Hydrology

Node	Location	Cumulative Drainage Area (ac)	10-Year Flow (cfs)	25-Year Flow (cfs)	100-Year Flow (cfs)
1970	West Bellevue Drive & I-5 Fwy	484	537	667	859
1978	Ball Road at ABC Channel	643	615	786	1067

7.2 Analysis of Existing Improvements

Currently the major storm drain system Drainage Area 19 begins in South St. east of S. East St. and continues west along South St. and confluences with several laterals. The line continues to Harbor Blvd, where it confluences with a major storm drain system at the intersection of South Street and Harbor Blvd. The Harbor Blvd storm drain line begins as a 24" RCP at a flow bifurcation structure on a 93" RCP at the intersection of Harbor Blvd and Lincoln Blvd. It continues south and crosses under a 42" RCP at Broadway. Excess flow from the lateral is then forced up an existing junction structure box to the 42" RCP in Broadway. The lateral continues south and increases to a 72" RCP before it confluences with the 78" mainline RCP in South St and transitions to a 96" RCP in South St.

The storm drain continues west to Bellevue Drive, where it turns southerly and transitions to a 12'x 6' RCB. The RCB then turns westerly and crosses under the I-5 Freeway to Hampshire Drive, then south on Walnut St. , west on Ball Road and discharges into the ABC Channel.

As shown in Appendix B, the estimated flow diverted from the 93" RCP in Lincoln Blvd to the 24" lateral in Harbor Blvd is estimated to be 24 CFS. This analysis assumes flows in excess of this amount in the lateral, will be diverted to the 42" RCP in Broadway.

The following street segments do not meet the City's flooded width criteria:

1. Harbor Blvd from Santa Ana St to South St.
2. South St. from Harbor Blvd to Bellevue Dr.
3. Bellevue Dr. from South St. to I-5
4. Hampshire Ave. from Disneyland Dr. to Walnut St.
5. Walnut St. from Hampshire Ave. to Ball Road
6. Ball Road from Walnut St. to ABC Channel

The existing street flow hydraulic calculations for Drainage Area 19 can be found in Appendices A and B.

7.3 Proposed Improvements

As discussed under Section 7.2, several streets in Drainage Area 19 do not meet the City's allowable flood width requirement. A few of the street segments currently do not have underground storm drain improvements.

This report recommends construction of new storm drain improvements to convey the full flow of the 10 year storm along the following street segments:

- Install 700 Ft of 39" RCP in West St from Santa Ana St. to Water St.
- Install 810 Ft of 39" RCP in Janss St from Water St. to South St.
- Install 270 Ft of 39" RCP in Dickel St. from Hampshire. to Clementine St.
- Install 530 Ft of 39" RCP in Hampshire Ave. from Harbor Blvd to Dickel St.

The remaining street segments that do not meet the flood width requirement currently have underground storm drains but do not have sufficient flow capacity. Appendix B provides the specific improvement options for the street segments listed in Section 7.2 in order to meet the flood width criteria.

Alternatives 1 and 2 below provide the approximate sizes of conduits to replace or augment each existing storm drain capacity, respectively. Alternative 3 is a combination of Alternatives 1 and 2 where the smaller sized conduits are removed and replaced and the larger conduits are protected in place and augmented with new parallel conduits.

Drainage Area 19 Alternative Improvements:

Alternative 1-

- **Harbor Blvd from Santa Ana St to South St.-** Remove and replace existing 60″ and 72″ RCP from Santa Ana to South St with a new 84″ RCP.
- **South St. from Harbor Blvd to Bellevue Dr.-** Appendix B shows the proposed new conduits as RCP. However, because of the large sizes of the required pipes, it is recommended to replace the existing storm drains with reinforced concrete box conduits, as follows:
    - **South St. from Harbor to CitronSt. -**Remove and replace existing 96″ RCP with a new 8.5′ x 8′ RCB
    - **South St. from Citron St. to Bellevue Dr.-** Remove and replace existing 96″ RCP with a new 12′ x 9.5′ RCB
- **Bellevue Dr. from South St. to I-5-** Remove and replace existing 12′ x 6′ RCB with a new 11.5′ x 9′-7″ RCB.
- **CalTrans I-5 Crossing at Hampshire from W. Bellvue to Disneyland Dr.-** Remove and replace the existing 12′ x 6′ RCB with a 13.5′ x 10′ RCB.
- **Hampshire Ave. from Disneyland Dr. to Walnut St.-** Remove and replace existing 2-8′ x 5′ RCB with a new 2- 9.5′ x 8′ RCB.
- **Walnut St. from Hampshire Ave. to Ball Road-** Remove and replace existing 6.75′ x 10.5′ RCB with a new 13′ x 11.5′ RCB.
- **Ball Road from Walnut St. to ABC Channel-** Remove and replace existing 6.5′ x 11′ RCB with a new 13′ x 11.5′ RCB.

Alternative 2-

- **Harbor Blvd from Santa Ana St to South St.-** Construct a new 72″ RCP parallel to the existing 60″ and 72″ RCP between Santa Ana and South St.
- **South St. from Harbor Blvd to Bellevue Dr.-** It is also possible to increase the underground storm drain capacity by constructing new storm drains as shown below. However, this option would require extensive utility relocation and may create conflicts with existing sanitary sewer laterals.
    - **South St. from Harbor to Citron St.-** Construct a new 51″ RCP parallel to the existing 96″ RCP.
    - **South St. from Citron St. to Bellevue Dr.-** Construct a 114″ RCP parallel to the existing 96″ RCP.
- **Bellevue Dr. from South St. to I-5-** Construct a new 10.5′ x6′ RCB parallel to the existing 12′ x 6′ RCB.
- **CalTrans I-5 Crossing at Hampshire from W. Bellvue to Disneyland Dr.-** Construct a new 8.5′ x 6′ DRCB parallel to the existing 12′ x 6′ RCB
- **Hampshire Ave. from Disneyland Dr. to Walnut St.-** Construct a new 10.5′ x 5′ DRCB parallel to the existing 2-8′ x 5′ RCB.

- **Walnut St. from Hampshire Ave. to Ball Road-** Construct a new 9′ x 6.5′ DRCB parallel to the existing 6.75′ x 10.5′ RCB.
- **Ball Road from Walnut St. to ABC Channel-** Construct a new 9′ x 6.5′ DRCB parallel to the existing 6.5′ x 11′ RCB.

Alternative 3- (Recommended)

- **Harbor Blvd from Santa Ana St to South St.-** Remove and replace existing 60″ and 72″ RCP from Santa Ana to South St with a new 84″ RCP.
- **South St. from Harbor Blvd to Bellevue Dr.-** Appendix B shows the proposed new conduits as RCP. However, because of the large sizes of the required pipes, it is recommended to replace the existing storm drains with reinforced concrete box conduits, as follows:
    - **South St. from Harbor to CitronSt. -**Remove and replace existing 96″ RCP with a new 8.5′ x 8′ RCB
    - **South St. from Citron St. to Bellevue Dr.-** Remove and replace existing 96″ RCP with a new 12′ x 9.5′ RCB
- **Bellevue Dr. from South St. to I-5-** Construct a new 10.5′ x6′ RCB parallel to the existing 12′ x 6′ RCB.
- **CalTrans I-5 Crossing at Hampshire from W. Bellvue to Disneyland Dr.-** Construct a new 8.5′ x 6′ DRCB parallel to the existing 12′ x 6′ RCB
- **Hampshire Ave. from Disneyland Dr. to Walnut St.-** Construct a new 10.5′ x 5′ DRCB parallel to the existing 2-8′ x 5′ RCB.
- **Walnut St. from Hampshire Ave. to Ball Road-** Construct a new 9′ x 6.5′ DRCB parallel to the existing 6.75′ x 10.5′ RCB.
- **Ball Road from Walnut St. to ABC Channel-** Construct a new 9′ x 6.5′ DRCB parallel to the existing 6.5′ x 11′ RCB.

7.4 Cost Estimates

Summarized in Table 8 are the construction cost estimates by project location for Drainage Area 19. The cost estimates were prepared as discussed in Section 4.4. The detailed cost estimates for Drainage Area 19 can be found in Appendix E.

Table 8 – Drainage Area 19 Cost Estimate (2008 Dollars)

Drainage Area	Street	Type of Facility	Size	Estimated Cost
19	Harbor Blvd. (from Santa Ana to South)	Replacement per Alternative 3	84" RCP	**$1,383,000**
19	South St. (from Harbor to Citron) (from Citron to Bellvue)	Replacement per Alternative 3 Replacement per Alternative 3	8.5'X8 RCB 12'X9.5' RCB	**$2,691,000**
19	Bellvue Dr. (from South to I-5)	New Parallel per Alternative 3	10.5'X6' RCB	**$790,000**
19	CalTrans I-5 crossing (from Belvue to Disneyland Dr.)	New Parallel per Alternative 3	8.5' x 6' DRCB	**$1,702,000**
19	Hampshire Ave. (from Disneyland Dr to Walnut)	New Parallel per Alternative 3	10.5' x 5' DRCB	**$3,380,000**
19	Walnut St. (from Ball to Hampshire)	New Parallel per Alternative 3	9' x 6.5' DRCB	**$894,000**
19	Ball Rd. (from Walnut to ABC Channel)	New Parallel per Alternative 3	9' x 6.5' DRCB	**$2,067,000**
19	West St. (from Water to Santa Ana)	New	39" RCP	**$302,000**
19	Janss St. (from Water to South)	New	39" RCP	**$330,000**
19	Dickel/Hampshire (from Clementine to Harbor)	New	39" RCP	**$328,000**
TOTAL				$13,867,000

PROJECT AREA

LEGEND

- Drainage Area 4
- Drainage Area 12
- Drainage Area 14
- Drainage Area 19
- Drainage Area 20
- Drainage Area 21
- Drainage Area 22
- Drainage Area 23
- Anaheim City Limits
- Anaheim–Barber City Channel
- Existing Storm Drain
- Proposed Storm Drain (New)
- Proposed Storm Drain (R&R)
- Potential Retarding Basin Location

N.T.S.

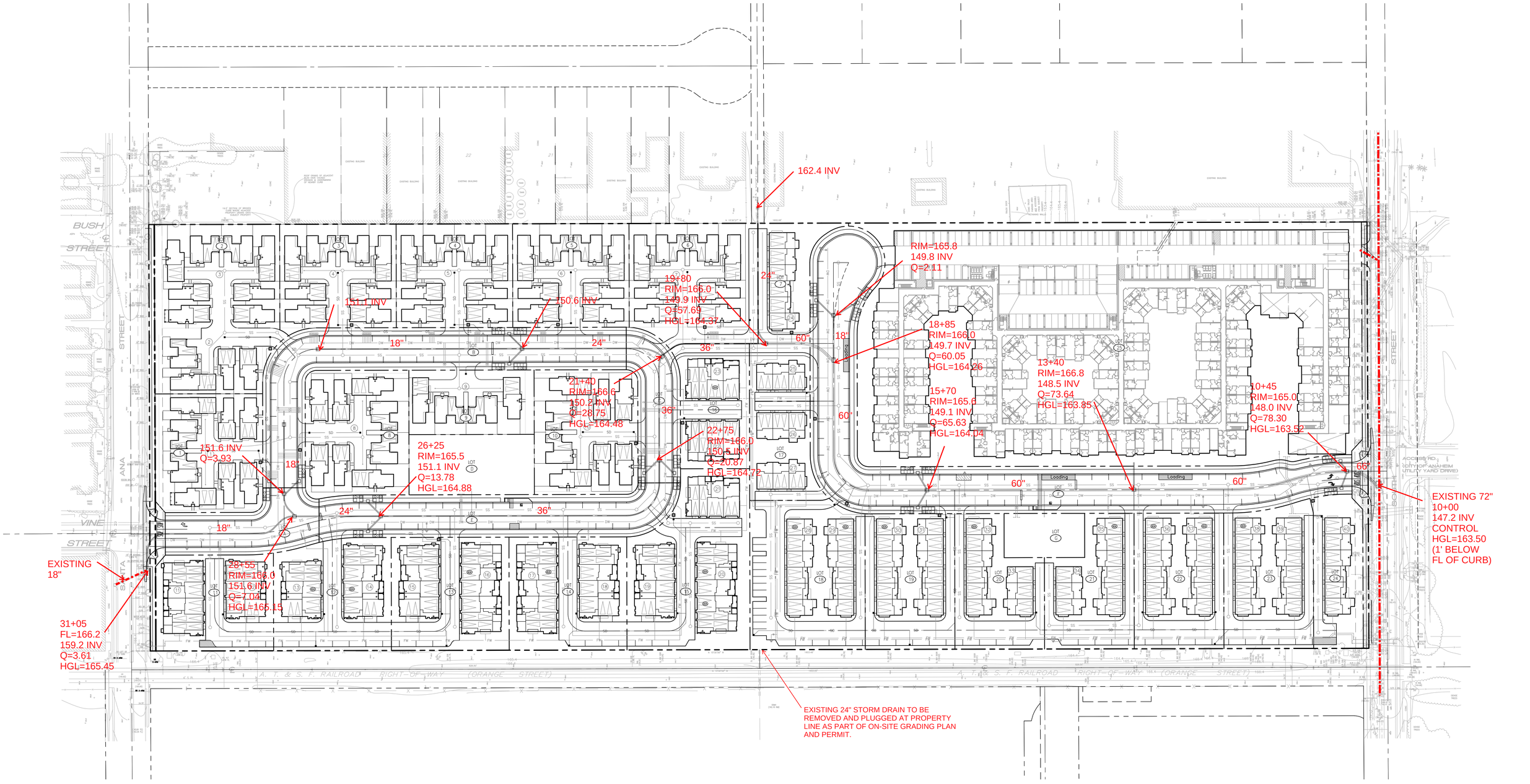
Figure 2
Proposed Storm
Drain Improvements

City of Anaheim Master Plan of Storm Drainage for Anaheim–Barber City Channel Tributary Area

CNC ENGINEERING

APPENDIX 6

PROPOSED STORM DRAIN EXHIBIT
(IN POCKET)



LEGEND

10+50 STORM DRAIN STATION

48" STORM DRAIN LINE SIZE

150.0 STORM DRAIN INVERT

Q=25.00 25 YEAR FLOW

HGL=166.20 HYDRAULIC GRADE LINE

RIM=166.0 MANHOLE RIM

50' 0' 25' 50'

SCALE: 1" = 50'

PROPOSED STORM DRAIN EXHIBIT

TECHNICAL SITE PLAN / EAST SOUTH STREET

THE SHOPOFF GROUP
ANAHEIM, CA

FUSCOE ENGINEERING
16795 Von Karman, Suite 100, Irvine, California 92606
tel 949.474.1960 ◦ fax 949.474.5315 ◦ www.fuscoe.com

MAY 25, 2017

APPENDIX 7

HYDRAULIC ANALYSIS OF PROPOSED STORM DRAIN

Program Package Serial Number: 7048

WATER SURFACE PROFILE LISTING

Date: 5-29-2017 Time:11: 1:49

FREEMAN

MAIN LINE

25 YEAR ANALYSIS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1000.000	147.200	16.300	163.500	78.30	3.30	.17	163.67	.00	2.43	.00	5.500	.000	.00	1 .0
45.000	.0178					.0005	.02	.00	.00	1.56	.013	.00	.00	PIPE
1045.000	148.000	15.551	163.551	78.30	3.30	.17	163.72	.00	2.43	.00	5.500	.000	.00	1 .0
JUNCT STR	.0178					.0007	.00	15.55	.00		.013	.00	.00	PIPE
1050.000	148.089	15.434	163.523	73.64	3.75	.22	163.74	.00	2.42	.00	5.000	.000	.00	1 .0
290.000	.0014					.0008	.23	15.43	.00	3.26	.013	.00	.00	PIPE
1340.000	148.490	15.264	163.754	73.64	3.75	.22	163.97	.00	2.42	.00	5.000	.000	.00	1 .0
JUNCT STR	.0020					.0007	.00	15.26	.00		.013	.00	.00	PIPE
1345.000	148.500	15.348	163.848	65.63	3.34	.17	164.02	.00	2.28	.00	5.000	.000	.00	1 .0
225.000	.0025					.0006	.14	15.35	.00	2.52	.013	.00	.00	PIPE
1570.000	149.060	14.931	163.991	65.63	3.34	.17	164.16	.00	2.28	.00	5.000	.000	.00	1 .0
JUNCT STR	.0024					.0006	.00	.00	.00		.013	.00	.00	PIPE
1575.000	149.072	14.968	164.040	60.05	3.06	.15	164.19	.00	2.18	.00	5.000	.000	.00	1 .0
310.000	.0020					.0005	.16	.00	.00	2.56	.013	.00	.00	PIPE
1885.000	149.680	14.554	164.234	60.05	3.06	.15	164.38	.00	2.18	.00	5.000	.000	.00	1 .0
JUNCT STR	.0020					.0005	.00	.00	.00		.013	.00	.00	PIPE
1890.000	149.690	14.566	164.256	57.69	2.94	.13	164.39	.00	2.13	.00	5.000	.000	.00	1 .0
90.000	.0020					.0005	.04	.00	.00	2.49	.013	.00	.00	PIPE

FREEMAN
MAIN LINE
25 YEAR ANALYSIS

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1980.000	149.870	14.449	164.319	57.69	2.94	.13	164.45	.00	2.13	.00	5.000	.000	.00	1 .0
JUNCT STR	.0020					.0004	.00	14.45	.00		.013	.00	.00	PIPE
1985.000	149.880	14.494	164.374	28.75	2.29	.08	164.46	.00	1.59	.00	4.000	.000	.00	1 .0
155.000	.0020					.0004	.06	14.49	.00	1.88	.013	.00	.00	PIPE
2140.000	150.190	14.271	164.461	28.75	2.29	.08	164.54	.00	1.59	.00	4.000	.000	.00	1 .0
JUNCT STR	.0020					.0007	.00	.00	.00		.013	.00	.00	PIPE
2145.000	150.200	14.277	164.477	20.87	2.95	.14	164.61	.00	1.47	.00	3.000	.000	.00	1 .0
130.000	.0020					.0010	.13	14.28	.00	1.85	.013	.00	.00	PIPE
2275.000	150.460	14.144	164.604	20.87	2.95	.14	164.74	.00	1.47	.00	3.000	.000	.00	1 .0
JUNCT STR	.0020					.0007	.00	14.14	.00		.013	.00	.00	PIPE
2280.000	150.470	14.246	164.716	13.78	1.95	.06	164.78	.00	1.18	.00	3.000	.000	.00	1 .0
345.000	.0019					.0004	.15	14.25	.00	1.46	.013	.00	.00	PIPE
2625.000	151.110	13.754	164.864	13.78	1.95	.06	164.92	.00	1.18	.00	3.000	.000	.00	1 .0
JUNCT STR	.0020					.0007	.00	13.75	.00		.013	.00	.00	PIPE
2630.000	151.120	13.759	164.879	7.04	2.24	.08	164.96	.00	.94	.00	2.000	.000	.00	1 .0
225.000	.0019					.0010	.22	13.76	.00	1.25	.013	.00	.00	PIPE
2855.000	151.550	13.547	165.097	7.04	2.24	.08	165.18	.00	.94	.00	2.000	.000	.00	1 .0
JUNCT STR	.0018					.0011	.01	.00	.00		.013	.00	.00	PIPE

Program Package Serial Number: 7048

WATER SURFACE PROFILE LISTING Date: 5-29-2017 Time:11: 1:49

FREEMAN
MAIN LINE
25 YEAR ANALYSIS

Station / L/Elem	Invert Elev / Ch Slope	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS) / SF Ave	Vel Head / HF	Energy Grd.El. / SE Dpth	Super Elev / Froude N	Critical Depth / Norm Dp	Flow Top Width / "N"	Height/ Dia.-FT / X-Fall	Base Wt or I.D. / ZR	ZL	No Wth Prs/Pip / Type Ch
2860.000	151.559	13.590	165.149	3.61	2.04	.06	165.21	.00	.73	.00	1.500	.000	.00	1 .0
245.000	.0312				.0012	.29	.00	.00	.45	.013		.00	.00	PIPE
WALL	ENTRANCE													
3105.000	159.200	6.252	165.452	3.61	2.04	.06	165.52	.00	.73	.00	1.500	.000	.00	0 .0

APPENDIX 8

STREET FLOW ANALYSIS OF SANTA ANA AND SOUTH STREETS

Hydraulic Analysis Report

Project Data

Project Title: Freeman Site

Designer:

Project Date: July 24, 2017

Project Units: U.S. Customary Units

Channel Analysis: Channel Analysis North Side of South Street

Input Parameters

Channel Type: Custom Cross Section

Cross Section Data

Elevation (ft)	Elevation (ft)	Manning's n
0.00	164.50	0.0150
20.00	164.20	0.0150
22.00	164.03	0.0150
22.10	164.70	0.0150
30.00	164.86	-----

Longitudinal Slope: 0.0050 ft/ft

Flow: 15.0100 cfs

Result Parameters

Depth: 0.5474 ft

Area of Flow: 5.4946 ft^2

Wetted Perimeter: 22.6403 ft

Hydraulic Radius: 0.2427 ft

Average Velocity: 2.7318 ft/s

Top Width: 22.0817 ft

Froude Number: 0.9651

Critical Depth: 0.5415 ft

Critical Velocity: 2.7973 ft/s

Critical Slope: 0.0054 ft/ft

Critical Top Width: 22.08 ft

Calculated Max Shear Stress: 0.1708 lb/ft^2

Calculated Avg Shear Stress: 0.0757 lb/ft^2

Composite Manning's n Equation: Lotter method

Manning's n: 0.0150

Results: Depth of 0.55 is below TC

Hydraulic Analysis Report

Project Data

Project Title: Freeman Site

Project Date: July 17, 2017

Project Units: U.S. Customary Units

Channel Analysis: Channel Analysis of Santa Ana Street Flow

Input Parameters

Channel Type: Street Cross Section

Cross Section Data

Station (ft)	Elevation (ft)	Manning's n
0.00	167.00	0.0150
20.00	166.70	0.0150
22.00	166.53	0.0150
22.10	167.13	0.0150
30.00	167.29	-----

Longitudinal Slope: 0.0050 ft/ft

Flow: 4.1900 cfs Q100

Result Parameters

Depth: 0.3937 ft

Area of Flow: 2.2990 ft^2

Wetted Perimeter: 17.3238 ft

Hydraulic Radius: 0.1327 ft

Average Velocity: 1.8225 ft/s

Top Width: 16.9814 ft

Froude Number: 0.8729

Critical Depth: 0.3792 ft

Critical Velocity: 2.0350 ft/s

Critical Slope: 0.0067 ft/ft

Critical Top Width: 16.01 ft

Calculated Max Shear Stress: 0.1228 lb/ft^2

Calculated Avg Shear Stress: 0.0414 lb/ft^2

Composite Manning's n Equation: Lotter method

Manning's n: 0.0150

Result: Depth of 0.3937 ft is below TC.

Hydraulic Analysis Report

Project Data

Project Title: Freeman Site

Designer:

Project Date: July 24, 2017

Project Units: U.S. Customary Units

Channel Analysis: Channel Analysis South Side of South Street

Input Parameters

Channel Type: Custom Cross Section

Cross Section Data

Elevation (ft)	Elevation (ft)	Manning's n
0.00	164.50	0.0150
20.00	164.20	0.0150
22.00	164.03	0.0150
22.10	164.70	0.0150
30.00	164.86	-----

Longitudinal Slope: 0.0050 ft/ft

Flow: 10.1700 cfs

Result Parameters

Depth: 0.4954 ft

Area of Flow: 4.3461 ft^2

Wetted Perimeter: 22.5357 ft

Hydraulic Radius: 0.1929 ft

Average Velocity: 2.3400 ft/s

Top Width: 22.0739 ft

Froude Number: 0.9294

Critical Depth: 0.4860 ft

Critical Velocity: 2.4572 ft/s

Critical Slope: 0.0059 ft/ft

Critical Top Width: 22.07 ft

Calculated Max Shear Stress: 0.1546 lb/ft^2

Calculated Avg Shear Stress: 0.0602 lb/ft^2

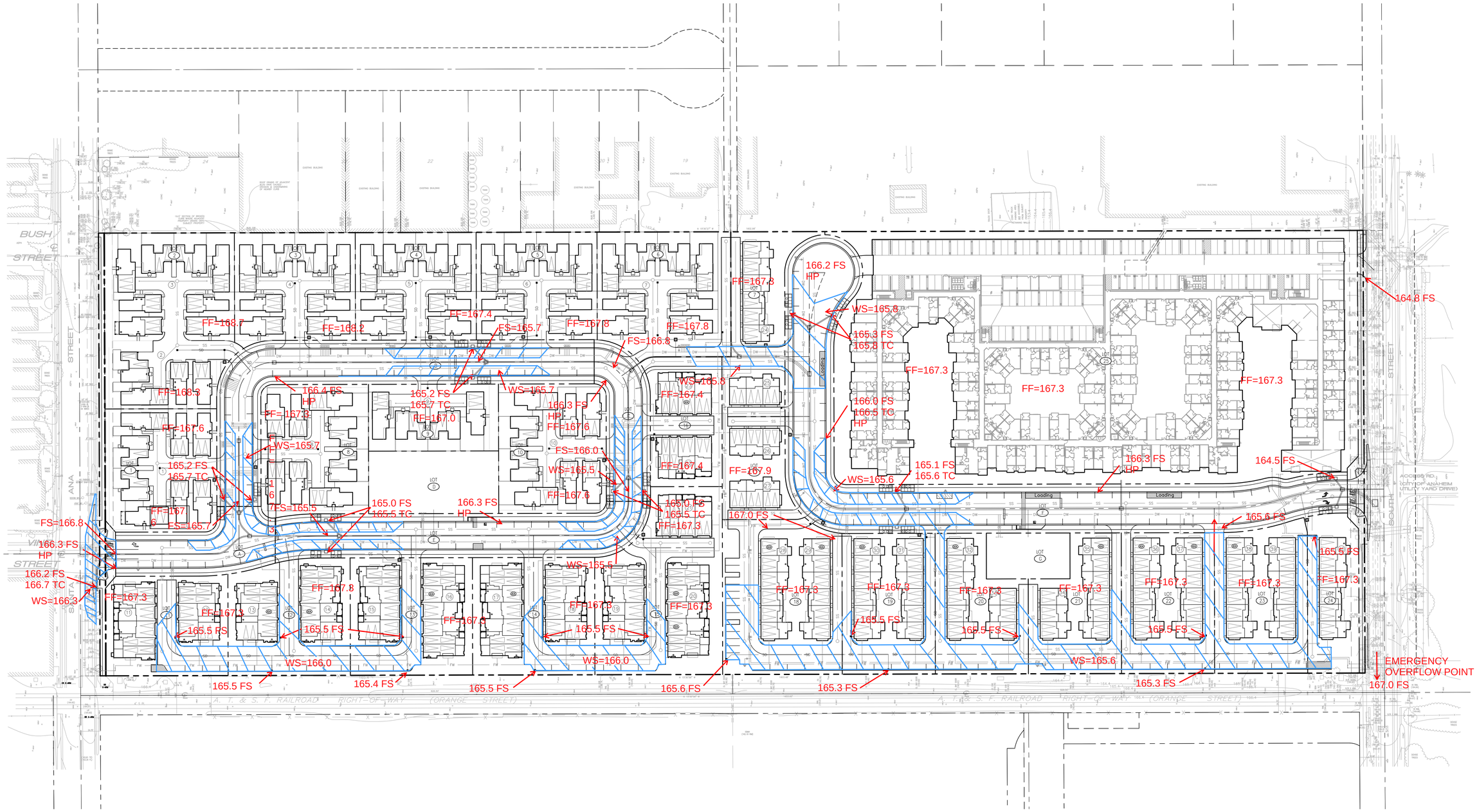
Composite Manning's n Equation: Lotter method

Manning's n: 0.0150

Result: Depth of 0.49 is below TC

APPENDIX 9

PONDING EXHIBIT
(IN POCKET)



LEGEND

PAD=166.0 BUILDING PAD

WS=165.0 MAXIMUM WATER SURFACE ELEVATION ASSUMING PLUGGED INLET

LIMITS OF PONDING

50' 0' 25' 50'

SCALE: 1" = 50'

PONDING EXHIBIT

TECHNICAL SITE PLAN / EAST SOUTH STREET

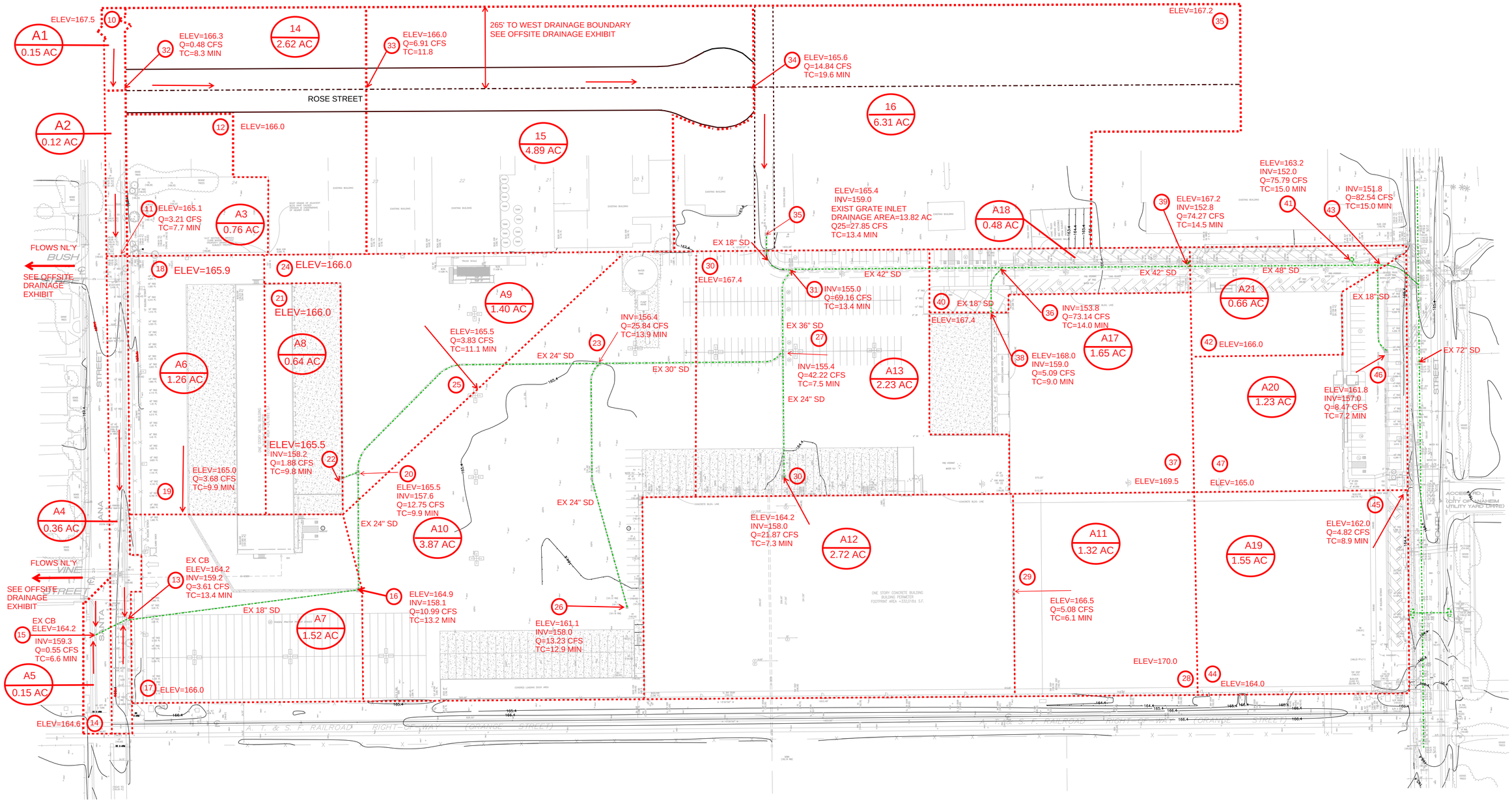
THE SHOPOFF GROUP
ANAHEIM, CA

FUSCOE ENGINEERING
16795 Von Karman, Suite 100, Irvine, California 92606
tel 949.474.1960 ◦ fax 949.474.5315 ◦ www.fuscoe.com

MAY 25, 2017

APPENDIX 10

EXISTING HYDROLOGY MAP
(IN POCKET)



LEGEND

- DRAINAGE AREA BOUNDARY
- A1 / 0.22 AC — AREA DESIGNATION / AREA (ACRES)
- 14 — HYDROLOGY NODE
- Q=10.00 CFS / TC=9.0 MIN — 25 YEAR FLOW RATE / TIME OF CONCENTRATION

NORTH
1"=50'

NOTE: ADD 2.4' TO ELEVATIONS SHOWN FOR CURRENT DATUM

EXISTING CONDITION HYDROLOGY MAP

APPENDIX 11

PROPOSED HYDROLOGY MAP SOUTH STREET (IN POCKET)

CITY OF ANAHEIM

0 100 200 Feet

Legend

- Manholes
- Laterals
- Catch Basin
- Main Line
- Private Line
- Cal Trans Line
- County Line
- On-Site Private Line
- Other

Point Structure

TYPE

- ANCHOR
- BULKHEAD
- CLEAN OUT
- COLLAR
- CONTERCEPTOR DRAIN
- CURB OPENING
- DESILTING BASIN
- DETECTION BOX
- DRAIN BOX
- DROP INLET
- FLOW THUR
- GRATE INLET
- HEADWALL
- INLET
- JUNCTION
- OUTLET
- PLUG
- PUMP STATION
- RISER
- SAND-OIL INTERCEPTOR
- STILLING WELL
- TRANSITION
- TRASH ENCLOSURE

Building Footprints

83	93	103
84	94	104
85	95	105

STORM DRAIN

94

PROJECT SITE

A1 — 1.43 AC

A2 — 3.15 AC

A3 — 0.19 AC

A4 — 0.92 AC

A5 — 2.66 AC

A8 — 0.15 AC

10 ELEV=168.0

11 ELEV=167.0 Q=5.47 CFS

12 ELEV=165.8 Q=15.01 CFS

13 ELEV=164.0 Q=15.01 CFS

14 ELEV=166.6

15 ELEV=166.0 Q=3.48 CFS

16 ELEV=164.0 Q=10.17 CFS

LEGEND

DRAINAGE AREA BOUNDARY

AREA DESIGNATION

AREA

25 HYDROLOGY NODE

Q=10.0 CFS 100 YEAR FLOW RATE

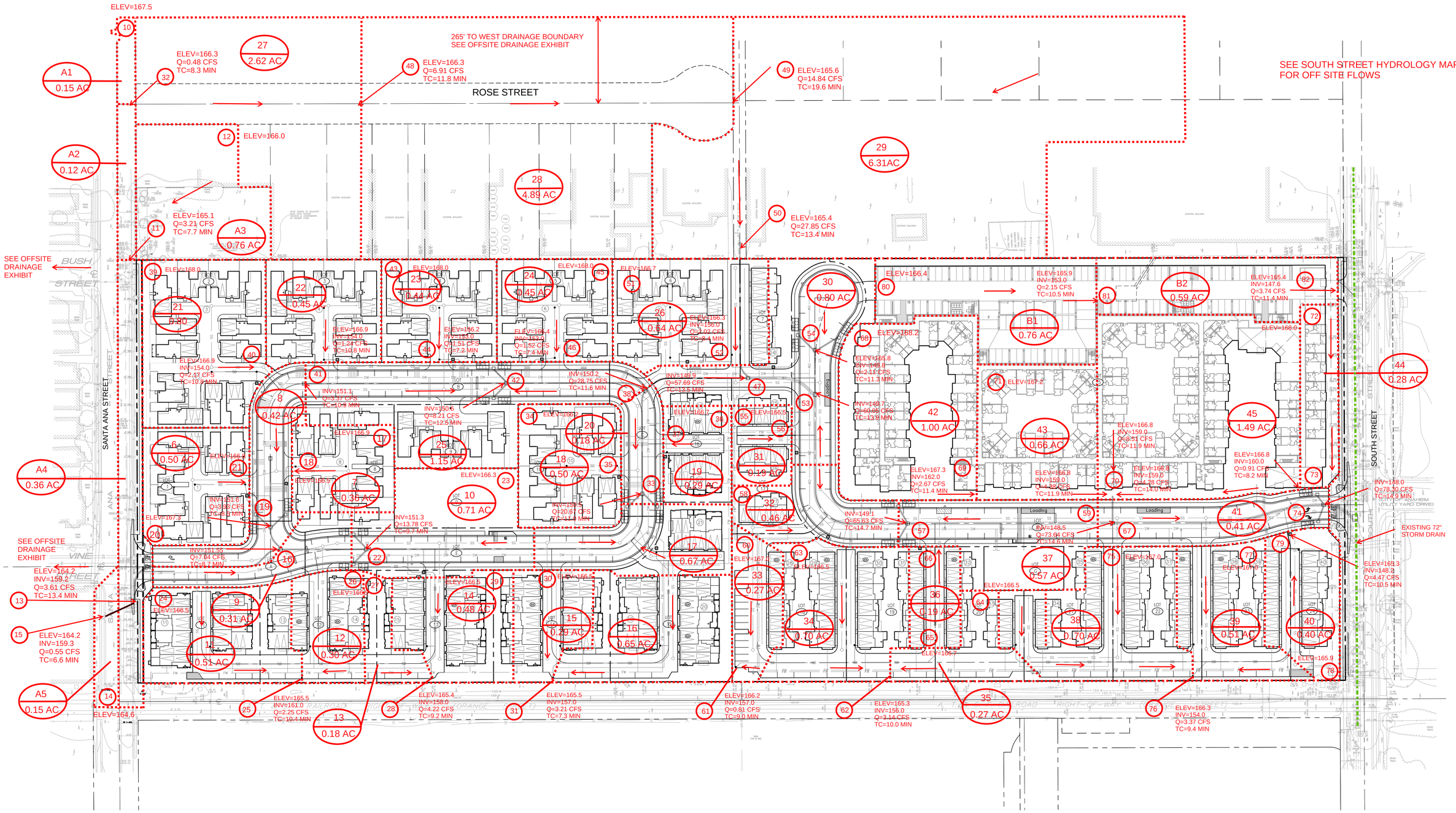
TC=9.0 MIN TIME OF CONCENTRATION

SOUTH STREET HYDROLOGY MAP

Plot Date: 8/8/2016

APPENDIX 12

PROPOSED HYDROLOGY MAP
(IN POCKET)



LEGEND

- DRAINAGE AREA BOUNDARY
- A8 / 0.15 AC — AREA DESIGNATION / AREA
- 25 — HYDROLOGY NODE
- Q=10.0 CFS — 25 YEAR FLOW RATE
- TC=9.0 MIN — TIME OF CONCENTRATION

50' 0' 25' 50'
SCALE: 1" = 50'

PROPOSED CONDITION HYDROLOGY MAP

TECHNICAL SITE PLAN / EAST SOUTH STREET

THE SHOPOFF GROUP
ANAHEIM, CA

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MAY 25, 2017