PRELIMINARY DRAINAGE REPORT FOR CLAIREMONT VILLAGE

3001 to 3089 Clairemont Drive

For the City of San Diego

April 20, 2022

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OBJECTIVE

This preliminary drainage report will show how the impacts of post-development flows will remain approximately the same as pre-development flows. Additionally, flows will not be diverted and will confluence at the same point during post development condition.

ASSUMPTIONS

This drainage report assumes the site is underlain by soil type D per the City of San Diego Drainage Design Manual, January 2017 Edition (Note 1 below Table A-1) and will have low permeability into the site's underlying soils. The project site is currently fully developed land covered by primarily impervious areas such as a long concrete driveway, concrete walkways, AC parking lots, and rooftops for existing structures. The Post-development condition will create a 224 multi-unit apartment community development located within the southern corner of the property, directly adjacent to Field Street and Cowley Way. Based on Table A-1 on Appendix A, Section A1.2 Runoff Coefficient for Rational Method of the City of San Diego Drainage Design Manual, January 2017 Edition, the proposed development area runoff coefficient corresponds to a C value of 0.70 for "Multi Units". Based on the existing land use type consisting of commercial buildings and parking lots servicing the existing commercial structures, the pre-project areas and undisturbed areas of the site in post development conditions shall correspond to a C value of 0.85 for "Commercial" land use type per Table A-1 from the City's Drainage Design Manual. Commercial area runoff coefficient's will be adjusted based on actual vs. tabulated % imperviousness as outlined under Table A-1 in the city's manual.

INTRODUCTION

This drainage report shall serve to depict existing and proposed drainage patterns for the Clairemont Village project located at 3001-3089 Clairemont Drive which is located directly northwest of the intersection of Field Street and Cowley Way. The proposed development portion of the project site is bound to the northwest by Sprouts' grocery store and other existing shops that make up the existing shopping mall within the property boundary, bound to the north by Rite-Aid, bound to the east by Cowley Way, and bound to the south by Field Street.

The project is not required to obtain approval from the Regional Water Quality Control Board (SWRCB) Under Federal Clean Water Act (CWA) Section 401 or 404. The project does no propose to discharge fill and dredged material to waters of the State, including waters of the U.S.

EXISTING DRAINAGE PATTERN

The onsite overland drainage to be analyzed for the proposed development is part of a bigger drainage area, which consists of several subareas such as: rooftops and partial rooftop footprints of the existing structures to the north and northwest, a portion of the AC parking lot on the west side of these structures that routes to an existing drainage inlet located in front of Sprouts (which ties back into the existing underground storm drain system routing southerly to the project's point of compliance), the existing concrete driveway located behind sprouts, the entire larger existing AC paved parking lot at the east side of the property boundary where the proposed apartment complex will be located, and the existing landscaped slope located along the Northeasterly property line. The general drainage pattern of the site can be simplified into two main directions of flow. The westerly drainage subareas either sheet flow or pipe flow easterly into a series of existing surface level drainage inlets located from North to South along the existing larger easterly AC parking lot. The easterly portions of the drainage subareas located along Cowley Way and the northeasterly property line sheet flow westerly to the same series of existing surface level drainage inlets located from North to South along the existing larger easterly AC parking lot. The entire tributary drainage area for this project flows southerly to the existing curb inlet located at the southerly corner of the existing AC paved parking lot. This existing curb inlet is located directly adjacent to the northwest curb return of the intersection of Field Street and Cowley Way. Flows are routed to this existing curb inlet via surface drainage as well as existing underground storm drain piping. This existing curb inlet location acts as the point of confluence for this project and will be utilized to compare post -development flows to pre-development flows. The westerly portion of the site however, the portion that is unaffected by the proposed development, sheet flows westerly to another Point of Compliance located at the corner of Burgener Blvd and Clairemont Drive. As this westerly draining portion of the site lies within the overall property boundary, it has also been analyzed within this report for pre-development and post development flows to ensure there is no net increase in flow leaving the site on this half of the development as well.

PROPOSED DRAINAGE PATTERN

Under post development conditions, the westerly drainage existing subareas either sheet flow or pipe flow easterly via a series of roof drains or existing surface level drainage inlets and existing storm drain piping. The westerly drainage will be picked up by a proposed length of underground storm drain piping that runs from the northerly corner of the site in front of rite-aid, to the northerly end of the existing concrete driveway at the central portion of the site. At this location, the proposed storm drain pipe run will tie into an existing preserved drainage inlet and then runoff will continue out to the the ultimate discharge point/point of confluence for the site at the corner of Cowley Way and Field Street via existing 24″ storm drain pipes. The main difference in drainage pattern under post development conditions, is runoff that is collected on the rooftops of the proposed structure being constructed in the rear AC parking lot, will now be diverted and routed into a series of biofiltration planters located along the sides of the building. These planters will treat the runoff, and discharge the stormwater collected from the proposed building northerly via a proposed discharge pipe. This pipe will route the stormwater captured from the structure footprint into a hydromodification storage vault located beneath the AC surface at the northerly corner of the site as shown on the post-development hydrology map. Runoff captured from the easterly most corner of the site will also differ slightly in post development conditions. The runoff in this area will be captured along the fire accessible

entrance road adjacent to the structure and will be routed along a proposed curb northerly. This runoff will empty into a proposed drainage inlet connected to a proposed modular wetland system. The MWS will treat the runoff and then discharge the runoff to the same northerly hydromodification storage vault. Once runoff is detained from both this tributary area and the larger tributary area of the proposed structure's footprint, the storage vault will discharge the runoff at controlled rates via an 18″ proposed storm drain outlet pipe that will route southwesterly, parallel to the other proposed storm drain that is picking up all the runoff from the existing westerly portions of the site. These two proposed storm drains will tie together at a proposed inlet and the combined flow will route into one more reach of proposed 18″ pipe. This last reach of proposed piping ties into the existing preserved drainage inlet previously mentioned and runoff is then carried off to the ultimate discharge point/point of confluence located at the existing curb inlet at the southerly corner of the project site. Due to the increase in overall stormwater flow length to the point of compliance as discussed above, there will be an increase in Time of Concentration. However, the general overall drainage pattern will be preserved under post development conditions.

This study contains 100-year hydrologic analyses to determine the existing and proposed flows generated by the project. The City of San Diego Drainage Design Manual, Jan. 2017 edition criteria along with the City of San Diego Rational Method was utilized in calculating runoff flows. This report utilizes AES, advanced engineering software, which incorporates the rational method to determine 100-year peak flows at all nodes of the entire drainage basin under both pre and post development conditions. Please see below for the City of San Diego's Drainage Design Manual's detailed description of the rational method procedure.

Rational Method and Modified Rational Method

A.1. Rational Method (RM)

The Rational Method (RM) is a mathematical formula used to determine the maximum runoff rate from a given rainfall. It has particular application in urban storm drainage where it is used to estimate peak runoff rates from small urban and rural watersheds for the design of storm drains and drainage structures. The RM is recommended for analyzing the runoff response from drainage areas for watersheds less than 0.5 square miles. It should not be used in instances where there is a junction of independent drainage systems or for drainage areas greater than approximately 0.5 square mile in size. In these instances, the Modified Rational Method (MRM) should be used for junctions of independent drainage systems in watersheds up to approximately 1 square mile in size (see Section A.2); or the NRCS Hydrologic Method should be used for watersheds greater than approximately 1 square mile in size (see Appendix B).

A1.1. Rational Method Formula

The RM formula estimates the peak rate of runoff at any location in a watershed as a function of the drainage area (A), runoff coefficient (C), and rainfall intensity (I) for a duration equal to the time of concentration (T_c), which is the time required for water to flow from the most remote point of the basin to the location being analyzed. The RM formula is expressed in Equation A-1.

Equation A-1. RM Formula Expression

$$Q = C\ I\ A$$

where:		
Q	=	peak discharge, in cubic feet per second (cfs)
C	=	runoff coefficient expressed as that percentage of rainfall which becomes surface runoff (no units); Refer to Appendix A.1.2
I	=	average rainfall intensity for a storm duration equal to the time of concentration (T_c) of the contributing drainage area, in inches per hour; Refer to Appendix A.1.3 and Appendix A.1.4
A	=	drainage area contributing to the design location, in acres

Combining the units for the expression CIA yields:

For

$$\left(\frac{1 \text{ acre} \times \text{inch}}{\text{hour}}\right)\left(\frac{43{,}560 \text{ ft}^2}{\text{acre}}\right)\left(\frac{1 \text{ foot}}{12 \text{ inches}}\right)\left(\frac{1 \text{ hour}}{3{,}600 \text{ seconds}}\right) \Rightarrow 1.008 \text{ cfs}$$

practical purposes, the unit conversion coefficient difference of 0.8% can be ignored.

The RM formula is based on the assumption that for constant rainfall intensity, the peak discharge rate at a point will occur when the raindrop that falls at the most upstream point in the tributary drainage basin arrives at the point of interest.

Unlike the MRM (discussed in Appendix A.2) or the NRCS hydrologic method (discussed in Appendix B), the RM does not create hydrographs and therefore does not add separate subarea hydrographs at collection points. Instead, the RM develops peak discharges in the main line by increasing the T_c as flow travels downstream.

Characteristics of, or assumptions inherent to, the RM are listed below:

1. The discharge resulting from any I is maximum when the I lasts as long as or longer than the T_c.
2. The storm frequency of peak discharges is the same as that of I for the given T_c.
3. The fraction of rainfall that becomes runoff (or the runoff coefficient, C) is independent of I or precipitation zone number (PZN) condition (PZN Condition is discussed in the NRCS method).
4. The peak rate of runoff is the only information produced by using the RM.

A.1.2. Runoff Coefficient

The runoff coefficients are based on land use (see Table A–1). Soil type “D” is used throughout the City of San Diego for storm drain conveyance design. An appropriate runoff coefficient (C) for each type of land use in the subarea should be selected from this table and multiplied by the percentage of the total area (A) included in that class. The sum of the products for all land uses is the weighted runoff coefficient (Σ[CA]). Good engineering judgment should be used when applying the values presented in Table A–1, as adjustments to these values may be appropriate based on site-specific characteristics.

Table A-1. Runoff Coefficients for Rational Method

Land Use	Runoff Coefficient (C)
	Soil Type [1]
Residential:	
Single Family	0.55
Multi–Units	0.70
Mobile Homes	0.65
Rural (lots greater than ½ acre)	0.45
Commercial [2]	
80% Impervious	0.85
Industrial [2]	
90% Impervious	0.95

Note:
[1] Type D soil to be used for all areas.
[2] Where actual conditions deviate significantly from the tabulated imperviousness values of 80% or 90%, the values given for coefficient C, may be revised by multiplying 80% or 90% by the ratio of actual imperviousness to the tabulated imperviousness. However, in case shall the final coefficient be less than 0.50. For example: Consider commercial property on D soil.

Actual imperviousness	=	50%
Tabulated imperviousness	=	80%
Revised C = (50/80) x 0.85	=	0.53

The values in Table A–1 are typical for urban areas. However, if the basin contains rural or agricultural land use, parks, golf courses, or other types of nonurban land use that are expected to be permanent, the appropriate value should be selected based upon the soil and cover and approved by the City.

Rainfall Intensity

The rainfall intensity (I) is the rainfall in inches per hour (in/hr.) for a duration equal to the T_C for a selected storm frequency. Once a particular storm frequency has been selected for design and a T_C calculated for the drainage area, the rainfall intensity can be determined from the Intensity-

Duration-Frequency Design Chart (Figure A-1).

CONCLUSION

The table below summarizes the existing Q100 flow vs. the proposed Q100 flow. The design of the proposed drainage systems precautions were taken to limit adverse downstream affects and to maintain existing drainage characteristics. Therefore, the Q100 for the project will just slightly decrease from 18.27 cfs in pre-development to 18.24 cfs during Post-Development conditions. Also, as anticipated, the flow to the second POC (node 500) was not altered from pre project to post project conditions. No increase in runoff was generated on this side of the project site either. The project has no increase in peak flows in the unmitigated 100-year storm condition, however onsite biofiltration planters, a modular wetland system, and an underground storage vault will further detain runoff onsite to adhere to water quality and hydromodification requirements.

PEAK Q-100 FLOWS

	C (avg)	**Tc Min**	**I In/hr**	**A (ac)**	**Q_{100} cfs**
Pre-Development					
Node 130	0.79	7.2	3.915	5.9	18.27
Post-Development					
Node 130	0.83	9.95	3.718	5.9	18.24
Net Increase					-.03
Pre-Development					
Node 500	0.85	8.9	3.99	6.6	22.47
Post-Development					
Node 500	0.85	8.9	3.99	6.6	22.47
Net Increase					.00

- The project will not alter the overall drainage patterns on the site.
- The ultimate discharge point for the project will not be changed
- Graded areas and slopes will be landscaped to reduce or eliminate sediment discharge.
- Construction and post-construction BMPs will address mitigation measures to protect water quality and protection of water quality objectives and beneficial uses to the maximum extent practicable.
- The storm drain system for the project is designed to route and convey all resulting runoff from developed conditions to the existing point of discharge.

APPENDIX A

AES CALCULATIONS

PRE-DEVELOPMENT

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          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                       2003,1985,1981 HYDROLOGY MANUAL
       (c) Copyright 1982-2007 Advanced Engineering Software (aes)
           Ver. 13.9 Release Date: 04/04/2008  License ID 1402

                          Analysis prepared by:

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                            San Diego, California 92108
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 ************************** DESCRIPTION OF STUDY **************************
* 1239 PROPOSED CONDITIONS - 100 YEAR STORM                               *
*                                                                         *
*                                                                         *
 *************************************************************************

  FILE NAME: 1239P100.DAT
  TIME/DATE OF STUDY: 09:27 09/22/2016
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  RAINFALL-INTENSITY ADJUSTMENT FACTOR = 1.000
  *USER SPECIFIED:
  NUMBER OF [TIME,INTENSITY] DATA PAIRS =  7
   1)   5.000;  4.400
   2)  10.000;  3.300
   3)  15.000;  2.900
   4)  30.000;  2.000
   5)  45.000;  1.550
   6)  60.000;  1.300
   7) 600.000;  0.330
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: ONLY PEAK CONFLUENCE VALUES CONSIDERED
  *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 0.0313 0.167 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  0.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint =  6.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

************************************************************************
  FLOW PROCESS FROM NODE     10.00 TO NODE     10.00 IS CODE =  22
------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
========================================================================
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8500
```

```
  S.C.S. CURVE NUMBER (AMC II) =   0
  USER SPECIFIED Tc(MIN.) =    5.000
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.400
  SUBAREA RUNOFF(CFS) =      1.23
  TOTAL AREA(ACRES) =      0.33   TOTAL RUNOFF(CFS) =      1.23

****************************************************************************
  FLOW PROCESS FROM NODE     10.00 TO NODE     10.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.400
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .5500
  S.C.S. CURVE NUMBER (AMC II) =   0
  SUBAREA AREA(ACRES) =    0.36   SUBAREA RUNOFF(CFS) =    0.87
  TOTAL AREA(ACRES) =        0.7   TOTAL RUNOFF(CFS) =       2.11
  TC(MIN.) =    5.00

****************************************************************************
  FLOW PROCESS FROM NODE     10.00 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) =   301.58  DOWNSTREAM(FEET) =   299.78
  FLOW LENGTH(FEET) =   180.00   MANNING'S N =  0.010
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   5.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.65
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.11
  PIPE TRAVEL TIME(MIN.) =   0.53    Tc(MIN.) =    5.53
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     20.00 =     180.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     20.00 TO NODE     20.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.283
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8100
  S.C.S. CURVE NUMBER (AMC II) =   0
  SUBAREA AREA(ACRES) =    0.60   SUBAREA RUNOFF(CFS) =    2.08
  TOTAL AREA(ACRES) =        1.3   TOTAL RUNOFF(CFS) =       4.19
  TC(MIN.) =    5.53

****************************************************************************
  FLOW PROCESS FROM NODE     20.00 TO NODE     30.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   299.78  DOWNSTREAM(FEET) =   298.70
  FLOW LENGTH(FEET) =   108.00   MANNING'S N =  0.010
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   9.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.52
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.19
  PIPE TRAVEL TIME(MIN.) =   0.28    Tc(MIN.) =    5.81
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     30.00 =     288.00 FEET.

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

```
 FLOW PROCESS FROM NODE     30.00 TO NODE     30.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.223
 *USER SPECIFIED(SUBAREA):
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8500
 S.C.S. CURVE NUMBER (AMC II) =   0
 SUBAREA AREA(ACRES) =    1.12   SUBAREA RUNOFF(CFS) =    4.02
 TOTAL AREA(ACRES) =        2.4   TOTAL RUNOFF(CFS) =       8.21
 TC(MIN.) =    5.81

****************************************************************************
 FLOW PROCESS FROM NODE     30.00 TO NODE     40.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   298.20  DOWNSTREAM(FEET) =   297.35
 FLOW LENGTH(FEET) =    85.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.44
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       8.21
 PIPE TRAVEL TIME(MIN.) =   0.22    Tc(MIN.) =    6.03
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     40.00 =     373.00 FEET.

+--------------------------------------------------------------------------+
| The slope of the exist. 10" SD has been calculated to be ~1.0.           |
| AES has been used to calculate the capacity of a 10" SD with a slope     |
| of 1.0%. 0.50 CFS have been added as a safety. Q 10" SD = ~3.45 CFS      |
+--------------------------------------------------------------------------+

****************************************************************************
 FLOW PROCESS FROM NODE     40.00 TO NODE     40.00 IS CODE =  16
----------------------------------------------------------------------------
 >>>>>USER SPECIFIED CONSTANT SOURCE FLOW AT NODE<<<<<
============================================================================
 USER-SPECIFIED CONSTANT SOURCE FLOW =     3.45(CFS)
 USER-SPECIFIED AREA ASSOCIATED TO SOURCE FLOW =     1.51(ACRES)
 * CUMULATIVE SOURCE FLOW DATA: FLOW(CFS) =     3.45  AREA(AC.) =     1.51
 * SUMMED DATA: FLOW(CFS) =    11.66    TOTAL AREA(ACRES) =     3.92

****************************************************************************
 FLOW PROCESS FROM NODE     40.00 TO NODE     50.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   297.35  DOWNSTREAM(FEET) =   293.98
 FLOW LENGTH(FEET) =   250.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.67
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      11.66
 PIPE TRAVEL TIME(MIN.) =   0.54    Tc(MIN.) =    6.57
 * TOTAL SOURCE FLOW(CFS) =       3.45
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     50.00 =     623.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     50.00 TO NODE     50.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
```

```
==========================================================================

**************************************************************************
  FLOW PROCESS FROM NODE     60.00 TO NODE     60.00 IS CODE =  22
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  USER SPECIFIED Tc(MIN.) =    5.000
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.400
  SUBAREA RUNOFF(CFS) =      1.08
  TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      1.08

**************************************************************************
  FLOW PROCESS FROM NODE     60.00 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) =   297.33  DOWNSTREAM(FEET) =   296.57
  FLOW LENGTH(FEET) =    32.00   MANNING'S N =  0.010
  DEPTH OF FLOW IN   6.0 INCH PIPE IS   4.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.35
  ESTIMATED PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.08
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    5.08
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     70.00 =      49.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     80.00 IS CODE =  31
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   296.57  DOWNSTREAM(FEET) =   295.61
  FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.010
  DEPTH OF FLOW IN   6.0 INCH PIPE IS   4.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.40
  ESTIMATED PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.08
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =    5.19
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     80.00 =      89.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE     80.00 TO NODE     80.00 IS CODE =  10
--------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
==========================================================================

**************************************************************************
  FLOW PROCESS FROM NODE     90.00 TO NODE     90.00 IS CODE =  22
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  USER SPECIFIED Tc(MIN.) =    5.000
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.400
  SUBAREA RUNOFF(CFS) =      0.71
  TOTAL AREA(ACRES) =      0.19   TOTAL RUNOFF(CFS) =      0.71
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     90.00 TO NODE     80.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   299.00  DOWNSTREAM(FEET) =   298.68
  FLOW LENGTH(FEET) =    16.00   MANNING'S N =  0.010
  DEPTH OF FLOW IN   6.0 INCH PIPE IS   3.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.56
  ESTIMATED PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.71
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    5.05
  LONGEST FLOWPATH FROM NODE     90.00 TO NODE     80.00 =      56.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     80.00 TO NODE     80.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF       Tc       INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)    (INCH/HOUR)   (ACRE)
      1        0.71     5.05       4.389        0.19
  LONGEST FLOWPATH FROM NODE     90.00 TO NODE     80.00 =      56.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF       Tc       INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)    (INCH/HOUR)   (ACRE)
      1        1.08     5.19       4.359        0.29
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     80.00 =      89.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc       INTENSITY
  NUMBER     (CFS)     (MIN.)    (INCH/HOUR)
      1       1.79       5.05        4.389
      2       1.79       5.19        4.359

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       1.79   Tc(MIN.) =    5.19
  TOTAL AREA(ACRES) =        0.5

****************************************************************************
  FLOW PROCESS FROM NODE     80.00 TO NODE     80.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     80.00 TO NODE     95.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   295.61  DOWNSTREAM(FEET) =   294.89
  FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.010
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   4.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.52
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.79
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =    5.25
```

```
 LONGEST FLOWPATH FROM NODE     60.00 TO NODE     95.00 =     119.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     95.00 TO NODE     95.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 IS CODE =  22
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 *USER SPECIFIED(SUBAREA):
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8500
 S.C.S. CURVE NUMBER (AMC II) =   0
 USER SPECIFIED Tc(MIN.) =    5.000
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.400
 SUBAREA RUNOFF(CFS) =      0.19
 TOTAL AREA(ACRES) =      0.05   TOTAL RUNOFF(CFS) =      0.19

****************************************************************************
 FLOW PROCESS FROM NODE    100.00 TO NODE     95.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   298.00  DOWNSTREAM(FEET) =   296.39
 FLOW LENGTH(FEET) =   109.00   MANNING'S N =  0.010
 DEPTH OF FLOW IN   6.0 INCH PIPE IS   1.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.45
 ESTIMATED PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.19
 PIPE TRAVEL TIME(MIN.) =   0.53    Tc(MIN.) =    5.53
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE     95.00 =     125.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     95.00 TO NODE     95.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
 STREAM     RUNOFF      Tc       INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
    1         0.19     5.53       4.284        0.05
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE     95.00 =     125.00 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc       INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
    1         1.79     5.25       4.344        0.48
 LONGEST FLOWPATH FROM NODE     60.00 TO NODE     95.00 =     119.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc       INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
    1       1.97       5.25        4.344
    2       1.95       5.53        4.284

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       1.97   Tc(MIN.) =    5.25
 TOTAL AREA(ACRES) =        0.5
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     95.00 TO NODE     95.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     95.00 TO NODE     50.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   294.89  DOWNSTREAM(FEET) =   294.48
  FLOW LENGTH(FEET) =    17.00   MANNING'S N =  0.010
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   5.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.72
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.97
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =    5.29
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE     50.00 =     142.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     50.00 TO NODE     50.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        1.97     5.29       4.336        0.53
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE     50.00 =     142.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY     AREA     SOURCE
  NUMBER      (CFS)   ( MIN.)   (INCH/HOUR)   (ACRE)     FLOW
      1        8.21     6.57       4.055        2.41      3.45
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     50.00 =     623.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1       9.65       5.29        4.336
      2      10.05       6.57        4.055

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      10.05   Tc(MIN.) =    6.57
  TOTAL AREA(ACRES) =        2.9

  * SOURCE FLOW DATA: FLOW(CFS) =       3.45     AREA(ACRES) =        1.5
  * SUMMED DATA: FLOW(CFS) =      13.50    TOTAL AREA(ACRES) =        4.4

****************************************************************************
  FLOW PROCESS FROM NODE     50.00 TO NODE     50.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     50.00 TO NODE    110.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   293.48  DOWNSTREAM(FEET) =   292.97
  FLOW LENGTH(FEET) =    79.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.21
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      13.50
  PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =    6.78
  * TOTAL SOURCE FLOW(CFS) =       3.45
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE    110.00 =     702.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    120.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   292.97  DOWNSTREAM(FEET) =   292.73
  FLOW LENGTH(FEET) =    37.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.22
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      13.50
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =    6.88
  * TOTAL SOURCE FLOW(CFS) =       3.45
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE    120.00 =     739.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    120.00 TO NODE    130.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   292.73  DOWNSTREAM(FEET) =   291.94
  FLOW LENGTH(FEET) =   121.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.24
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      13.50
  PIPE TRAVEL TIME(MIN.) =   0.32    Tc(MIN.) =    7.20
  * TOTAL SOURCE FLOW(CFS) =       3.45
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE    130.00 =     860.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    130.00 TO NODE    130.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
================================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    140.00 TO NODE    150.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  *USER SPECIFIED(SUBAREA):
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =   0
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =    309.00
  DOWNSTREAM ELEVATION(FEET) =    307.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  URBAN SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.966
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.610
SUBAREA RUNOFF(CFS) =      0.16
TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.16

****************************************************************************
FLOW PROCESS FROM NODE    150.00 TO NODE    130.00 IS CODE =  51
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =    308.00  DOWNSTREAM(FEET) =    294.00
CHANNEL LENGTH THRU SUBAREA(FEET) =   461.00   CHANNEL SLOPE =  0.0304
CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   0.000
MANNING'S FACTOR = 0.013   MAXIMUM DEPTH(FEET) =   0.25
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.384
*USER SPECIFIED(SUBAREA):
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8500
S.C.S. CURVE NUMBER (AMC II) =   0
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.68
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.65
AVERAGE FLOW DEPTH(FEET) =   0.07   TRAVEL TIME(MIN.) =   2.11
Tc(MIN.) =    5.07
SUBAREA AREA(ACRES) =     1.39       SUBAREA RUNOFF(CFS) =    5.18
TOTAL AREA(ACRES) =        1.5         PEAK FLOW RATE(CFS) =       5.33

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  0.12   FLOW VELOCITY(FEET/SEC.) =   4.55
LONGEST FLOWPATH FROM NODE    140.00 TO NODE    130.00 =     541.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    130.00 TO NODE    130.00 IS CODE =  11
----------------------------------------------------------------------------
>>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

** MAIN STREAM CONFLUENCE DATA **
STREAM     RUNOFF       Tc       INTENSITY     AREA
NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
    1        5.33     5.07       4.384        1.46
LONGEST FLOWPATH FROM NODE    140.00 TO NODE    130.00 =     541.00 FEET.

** MEMORY BANK #  1 CONFLUENCE DATA **
STREAM     RUNOFF       Tc       INTENSITY     AREA     SOURCE
NUMBER      (CFS)   ( MIN.)   (INCH/HOUR)   (ACRE)     FLOW
    1       10.05     7.20       3.915        2.94      3.45
LONGEST FLOWPATH FROM NODE     10.00 TO NODE    130.00 =     860.00 FEET.

** PEAK FLOW RATE TABLE **
STREAM    RUNOFF       Tc       INTENSITY
NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
    1      14.31       5.07        4.384
    2      14.82       7.20        3.915

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =      14.82   Tc(MIN.) =    7.20
TOTAL AREA(ACRES) =        4.4

* SOURCE FLOW DATA: FLOW(CFS) =       3.45     AREA(ACRES) =        1.5
* SUMMED DATA: FLOW(CFS) =      18.27    TOTAL AREA(ACRES) =        5.9

****************************************************************************
FLOW PROCESS FROM NODE    130.00 TO NODE    130.00 IS CODE =  12
----------------------------------------------------------------------------
```

```
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
================================================================================
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        4.4  TC(MIN.) =      7.20
  PEAK FLOW RATE(CFS)   =      14.82
  * CUMULATIVE SOURCE FLOW DATA: FLOW(CFS) =       3.45  AREA(AC.) =        1.5
  * SUMMED DATA: FLOW(CFS) =      18.27    TOTAL AREA(ACRES) =        5.9
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

♀

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

          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                     2003,1985,1981 HYDROLOGY MANUAL
       (c) Copyright 1982-2012 Advanced Engineering Software (aes)
           Ver. 19.0 Release Date: 06/01/2012  License ID 1503

                          Analysis prepared by:

                            LANDMARK CONSULTING
                          9555 GENESEE AVE. SUITE 200
                              SAN DIEGO, CA 92121
                        TEL:  858-587-8070, FAX:  858-587-8750

 ************************** DESCRIPTION OF STUDY **************************
* 325-17 CLAIREMONT VILLAGE                                               *
* WESTERLY POC 2 ANALYSIS                                                 *
* DOES NOT CONFLUENCE WITH PROJECT SITE                                   *
 **************************************************************************

                          FILE NAME: 325E100.DAT
                       TIME/DATE OF STUDY: 16:50 04/20/2022
--------------------------------------------------------------------------
          USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
                        2003 SAN DIEGO MANUAL CRITERIA

                  USER SPECIFIED STORM EVENT(YEAR) = 100.00
                6-HOUR DURATION PRECIPITATION (INCHES) =   2.200
                  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
       SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
    NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *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   10.0      5.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0130

                    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 = 10.0 (FT*FT/S)
                     *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
                      OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
      FLOW PROCESS FROM NODE     10.00 TO NODE     20.00 IS CODE =  22
--------------------------------------------------------------------------
             >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
                        *USER SPECIFIED(SUBAREA):
                  USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                     S.C.S. CURVE NUMBER (AMC II) =   0
                     USER SPECIFIED Tc(MIN.) =    5.000
               100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.796
                        SUBAREA RUNOFF(CFS) =      0.25
```

```
      TOTAL AREA(ACRES) =      0.05   TOTAL RUNOFF(CFS) =      0.25

****************************************************************************
      FLOW PROCESS FROM NODE     20.00 TO NODE     30.00 IS CODE =  51
----------------------------------------------------------------------------
               >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
            >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    298.94  DOWNSTREAM(FEET) =    296.75
   CHANNEL LENGTH THRU SUBAREA(FEET) =   146.00   CHANNEL SLOPE =  0.0150
            CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   5.000
          MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
              100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.773
                        *USER SPECIFIED(SUBAREA):
                  USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                     S.C.S. CURVE NUMBER (AMC II) =   0
        TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.58
       TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.38
       AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   1.76
                           Tc(MIN.) =    6.76
     SUBAREA AREA(ACRES) =     0.16       SUBAREA RUNOFF(CFS) =    0.65
                  AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
   TOTAL AREA(ACRES) =        0.2         PEAK FLOW RATE(CFS) =       0.86

                  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
          DEPTH(FEET) =  0.05   FLOW VELOCITY(FEET/SEC.) =   1.65
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     30.00 =     146.00 FEET.

****************************************************************************
      FLOW PROCESS FROM NODE     30.00 TO NODE     30.00 IS CODE =  81
----------------------------------------------------------------------------
            >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
              100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.773
                        *USER SPECIFIED(SUBAREA):
                  USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                     S.C.S. CURVE NUMBER (AMC II) =   0
                  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8500
       SUBAREA AREA(ACRES) =    0.25   SUBAREA RUNOFF(CFS) =    1.00
      TOTAL AREA(ACRES) =        0.5   TOTAL RUNOFF(CFS) =       1.86
                           TC(MIN.) =    6.76

****************************************************************************
      FLOW PROCESS FROM NODE     30.00 TO NODE     30.00 IS CODE =   1
----------------------------------------------------------------------------
            >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
                        TOTAL NUMBER OF STREAMS =  2
            CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
                    TIME OF CONCENTRATION(MIN.) =    6.76
                     RAINFALL INTENSITY(INCH/HR) =   4.77
                      TOTAL STREAM AREA(ACRES) =     0.46
                PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.86

****************************************************************************
      FLOW PROCESS FROM NODE     40.00 TO NODE     50.00 IS CODE =  22
----------------------------------------------------------------------------
            >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
                        *USER SPECIFIED(SUBAREA):
```

USER-SPECIFIED RUNOFF COEFFICIENT = .8500
S.C.S. CURVE NUMBER (AMC II) = 0
USER SPECIFIED Tc(MIN.) = 5.000
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.796
SUBAREA RUNOFF(CFS) = 0.27
TOTAL AREA(ACRES) = 0.05 TOTAL RUNOFF(CFS) = 0.27

****
FLOW PROCESS FROM NODE 50.00 TO NODE 30.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 303.66 DOWNSTREAM(FEET) = 302.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 232.00 CHANNEL SLOPE = 0.0072
CHANNEL BASE(FEET) = 10.00 "Z" FACTOR = 5.000
MANNING'S FACTOR = 0.015 MAXIMUM DEPTH(FEET) = 2.00
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.332
*USER SPECIFIED(SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = .8500
S.C.S. CURVE NUMBER (AMC II) = 0
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1.00
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 1.36
AVERAGE FLOW DEPTH(FEET) = 0.07 TRAVEL TIME(MIN.) = 2.85
Tc(MIN.) = 7.85
SUBAREA AREA(ACRES) = 0.39 SUBAREA RUNOFF(CFS) = 1.44
AREA-AVERAGE RUNOFF COEFFICIENT = 0.850
TOTAL AREA(ACRES) = 0.4 PEAK FLOW RATE(CFS) = 1.64

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.09 FLOW VELOCITY(FEET/SEC.) = 1.66
LONGEST FLOWPATH FROM NODE 40.00 TO NODE 30.00 = 378.00 FEET.

****
FLOW PROCESS FROM NODE 30.00 TO NODE 30.00 IS CODE = 1

>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==========
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 7.85
RAINFALL INTENSITY(INCH/HR) = 4.33
TOTAL STREAM AREA(ACRES) = 0.45
PEAK FLOW RATE(CFS) AT CONFLUENCE = 1.64

** CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	1.86	6.76	4.773	0.46
2	1.64	7.85	4.332	0.45

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	3.27	6.76	4.773
2	3.33	7.85	4.332

```
          COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
       PEAK FLOW RATE(CFS) =       3.33   Tc(MIN.) =    7.85
                  TOTAL AREA(ACRES) =        0.9
 LONGEST FLOWPATH FROM NODE     40.00 TO NODE     30.00 =     378.00 FEET.

****************************************************************************
     FLOW PROCESS FROM NODE     30.00 TO NODE     60.00 IS CODE =  62
----------------------------------------------------------------------------
          >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
               >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  302.00  DOWNSTREAM ELEVATION(FEET) =  293.00
       STREET LENGTH(FEET) =   309.00   CURB HEIGHT(INCHES) =  6.0
                  STREET HALFWIDTH(FEET) = 10.00

        DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   5.00
                INSIDE STREET CROSSFALL(DECIMAL) =  0.020
               OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

           SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
               STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
    Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

       **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.35
             STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                   STREET FLOW DEPTH(FEET) =  0.29
                 HALFSTREET FLOOD WIDTH(FEET) =    8.40
               AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.06
             PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.20
        STREET FLOW TRAVEL TIME(MIN.) =   1.27   Tc(MIN.) =    9.12
             100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.934
                       *USER SPECIFIED(SUBAREA):
                  USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                     S.C.S. CURVE NUMBER (AMC II) =   0
                  AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
    SUBAREA AREA(ACRES) =    0.01      SUBAREA RUNOFF(CFS) =    0.04
  TOTAL AREA(ACRES) =        0.9       PEAK FLOW RATE(CFS) =       3.33

                  END OF SUBAREA STREET FLOW HYDRAULICS:
       DEPTH(FEET) = 0.29   HALFSTREET FLOOD WIDTH(FEET) =   8.40
  FLOW VELOCITY(FEET/SEC.) =  4.04   DEPTH*VELOCITY(FT*FT/SEC.) =   1.19
 LONGEST FLOWPATH FROM NODE     40.00 TO NODE     60.00 =     687.00 FEET.

****************************************************************************
     FLOW PROCESS FROM NODE     60.00 TO NODE     60.00 IS CODE =  10
----------------------------------------------------------------------------
          >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
     FLOW PROCESS FROM NODE     70.00 TO NODE     80.00 IS CODE =  22
----------------------------------------------------------------------------
          >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
                       *USER SPECIFIED(SUBAREA):
                  USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                     S.C.S. CURVE NUMBER (AMC II) =   0
                     USER SPECIFIED Tc(MIN.) =    5.000
```

```
100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.796
SUBAREA RUNOFF(CFS) =      0.28
TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.28

****************************************************************************
FLOW PROCESS FROM NODE     80.00 TO NODE     90.00 IS CODE =  51
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =    303.90  DOWNSTREAM(FEET) =    300.61
CHANNEL LENGTH THRU SUBAREA(FEET) =   139.00   CHANNEL SLOPE =  0.0237
CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   5.000
MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.051
*USER SPECIFIED(SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = .8500
S.C.S. CURVE NUMBER (AMC II) =   0
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.85
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.95
AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   1.19
Tc(MIN.) =    6.19
SUBAREA AREA(ACRES) =     0.27       SUBAREA RUNOFF(CFS) =    1.15
AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
TOTAL AREA(ACRES) =        0.3         PEAK FLOW RATE(CFS) =       1.40

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  0.06   FLOW VELOCITY(FEET/SEC.) =   2.33
LONGEST FLOWPATH FROM NODE     70.00 TO NODE     90.00 =     448.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE     90.00 TO NODE     90.10 IS CODE =  91
----------------------------------------------------------------------------
>>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
UPSTREAM NODE ELEVATION(FEET) =    300.61
DOWNSTREAM NODE ELEVATION(FEET) =    293.66
CHANNEL LENGTH THRU SUBAREA(FEET) =   166.00
"V" GUTTER WIDTH(FEET) =   1.50   GUTTER HIKE(FEET) =  0.250
PAVEMENT LIP(FEET) =  0.100   MANNING'S N = .0150
PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
MAXIMUM DEPTH(FEET) =   1.00
100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.845
*USER SPECIFIED(SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = .8500
S.C.S. CURVE NUMBER (AMC II) =   0
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      1.42
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.69
AVERAGE FLOW DEPTH(FEET) =   0.35   FLOOD WIDTH(FEET) =    1.50
"V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.41   Tc(MIN.) =    6.60
SUBAREA AREA(ACRES) =    0.01       SUBAREA RUNOFF(CFS) =    0.04
AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
TOTAL AREA(ACRES) =        0.3         PEAK FLOW RATE(CFS) =       1.40

NOTE:TRAVEL TIME ESTIMATES BASED ON NORMAL
DEPTH EQUAL TO [GUTTER-HIKE + PAVEMENT LIP]

END OF SUBAREA "V" GUTTER HYDRAULICS:
DEPTH(FEET) =  0.35   FLOOD WIDTH(FEET) =    1.50
FLOW VELOCITY(FEET/SEC.) =   6.69   DEPTH*VELOCITY(FT*FT/SEC) =   2.34
```

```
 LONGEST FLOWPATH FROM NODE     70.00 TO NODE     90.10 =     614.00 FEET.

****************************************************************************
      FLOW PROCESS FROM NODE     90.10 TO NODE     90.10 IS CODE =   1
----------------------------------------------------------------------------
           >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
                        TOTAL NUMBER OF STREAMS =  2
          CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
                  TIME OF CONCENTRATION(MIN.) =    6.60
                   RAINFALL INTENSITY(INCH/HR) =   4.84
                    TOTAL STREAM AREA(ACRES) =     0.34
               PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.40

****************************************************************************
      FLOW PROCESS FROM NODE    100.00 TO NODE    110.00 IS CODE =  22
----------------------------------------------------------------------------
           >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
                         *USER SPECIFIED(SUBAREA):
                  USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                     S.C.S. CURVE NUMBER (AMC II) =   0
                     USER SPECIFIED Tc(MIN.) =    5.000
            100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.796
                       SUBAREA RUNOFF(CFS) =      0.37
      TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.37

****************************************************************************
      FLOW PROCESS FROM NODE    110.00 TO NODE     90.10 IS CODE =  51
----------------------------------------------------------------------------
           >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
         >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    303.90  DOWNSTREAM(FEET) =    293.66
   CHANNEL LENGTH THRU SUBAREA(FEET) =   252.00   CHANNEL SLOPE =  0.0406
            CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   5.000
         MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
             100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.853
                         *USER SPECIFIED(SUBAREA):
                  USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                     S.C.S. CURVE NUMBER (AMC II) =   0
       TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.37
      TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.65
      AVERAGE FLOW DEPTH(FEET) =   0.05   TRAVEL TIME(MIN.) =   1.59
                           Tc(MIN.) =    6.59
    SUBAREA AREA(ACRES) =     0.49       SUBAREA RUNOFF(CFS) =    2.00
                AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
  TOTAL AREA(ACRES) =        0.6         PEAK FLOW RATE(CFS) =       2.31

                END OF SUBAREA CHANNEL FLOW HYDRAULICS:
          DEPTH(FEET) =  0.07   FLOW VELOCITY(FEET/SEC.) =   3.40
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE     90.10 =     418.00 FEET.

****************************************************************************
      FLOW PROCESS FROM NODE     90.10 TO NODE     90.10 IS CODE =   1
----------------------------------------------------------------------------
           >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
          >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
                        TOTAL NUMBER OF STREAMS =  2
```

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 6.59
RAINFALL INTENSITY(INCH/HR) = 4.85
TOTAL STREAM AREA(ACRES) = 0.56
PEAK FLOW RATE(CFS) AT CONFLUENCE = 2.31

** CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	1.40	6.60	4.845	0.34
2	2.31	6.59	4.853	0.56

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	3.70	6.59	4.853
2	3.70	6.60	4.845

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 3.70 Tc(MIN.) = 6.59
TOTAL AREA(ACRES) = 0.9
LONGEST FLOWPATH FROM NODE 70.00 TO NODE 90.10 = 614.00 FEET.

****
FLOW PROCESS FROM NODE 90.10 TO NODE 60.00 IS CODE = 91

>>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
==
UPSTREAM NODE ELEVATION(FEET) = 293.66
DOWNSTREAM NODE ELEVATION(FEET) = 293.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 10.00
"V" GUTTER WIDTH(FEET) = 1.50 GUTTER HIKE(FEET) = 0.250
PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
MAXIMUM DEPTH(FEET) = 2.00
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.844
*USER SPECIFIED(SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = .8500
S.C.S. CURVE NUMBER (AMC II) = 0
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.72
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.28
AVERAGE FLOW DEPTH(FEET) = 0.38 FLOOD WIDTH(FEET) = 4.96
"V" GUTTER FLOW TRAVEL TIME(MIN.) = 0.02 Tc(MIN.) = 6.61
SUBAREA AREA(ACRES) = 0.01 SUBAREA RUNOFF(CFS) = 0.04
AREA-AVERAGE RUNOFF COEFFICIENT = 0.850
TOTAL AREA(ACRES) = 0.9 PEAK FLOW RATE(CFS) = 3.73

END OF SUBAREA "V" GUTTER HYDRAULICS:
DEPTH(FEET) = 0.39 FLOOD WIDTH(FEET) = 5.13
FLOW VELOCITY(FEET/SEC.) = 8.14 DEPTH*VELOCITY(FT*FT/SEC) = 3.14
LONGEST FLOWPATH FROM NODE 70.00 TO NODE 60.00 = 624.00 FEET.

****
FLOW PROCESS FROM NODE 60.00 TO NODE 60.00 IS CODE = 10

>>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
==

```
****************************************************************************
      FLOW PROCESS FROM NODE    120.00 TO NODE    130.00 IS CODE =  22
----------------------------------------------------------------------------
            >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
                        *USER SPECIFIED(SUBAREA):
                 USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                    S.C.S. CURVE NUMBER (AMC II) =   0
                    USER SPECIFIED Tc(MIN.) =    5.000
              100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.796
                     SUBAREA RUNOFF(CFS) =      0.49
       TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.49

****************************************************************************
      FLOW PROCESS FROM NODE    130.00 TO NODE     60.00 IS CODE =  51
----------------------------------------------------------------------------
               >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
            >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    297.42  DOWNSTREAM(FEET) =    293.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   150.00   CHANNEL SLOPE =  0.0295
          CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   5.000
        MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
            100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.018
                        *USER SPECIFIED(SUBAREA):
                 USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                    S.C.S. CURVE NUMBER (AMC II) =   0
       TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.83
      TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.99
      AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   1.25
                           Tc(MIN.) =    6.25
    SUBAREA AREA(ACRES) =     0.16       SUBAREA RUNOFF(CFS) =    0.68
                AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
  TOTAL AREA(ACRES) =        0.3         PEAK FLOW RATE(CFS) =       1.11

                END OF SUBAREA CHANNEL FLOW HYDRAULICS:
          DEPTH(FEET) =  0.05   FLOW VELOCITY(FEET/SEC.) =   2.23
 LONGEST FLOWPATH FROM NODE    120.00 TO NODE     60.00 =     160.00 FEET.

****************************************************************************
      FLOW PROCESS FROM NODE     60.00 TO NODE     60.00 IS CODE =  11
----------------------------------------------------------------------------
      >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

                    ** MAIN STREAM CONFLUENCE DATA **
             STREAM     RUNOFF      Tc      INTENSITY     AREA
             NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
               1        1.11     6.25       5.018        0.26
 LONGEST FLOWPATH FROM NODE    120.00 TO NODE     60.00 =     160.00 FEET.

                  ** MEMORY BANK #  1 CONFLUENCE DATA **
             STREAM     RUNOFF      Tc      INTENSITY     AREA
             NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
               1        3.33     9.12       3.934        0.91
 LONGEST FLOWPATH FROM NODE     40.00 TO NODE     60.00 =     687.00 FEET.

                        ** PEAK FLOW RATE TABLE **
                STREAM    RUNOFF       Tc      INTENSITY
```

NUMBER	(CFS)	(MIN.)	(INCH/HOUR)
1	3.39	6.25	5.018
2	4.20	9.12	3.934

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 4.20 Tc(MIN.) = 9.12
TOTAL AREA(ACRES) = 1.2

****
FLOW PROCESS FROM NODE 60.00 TO NODE 60.00 IS CODE = 12

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

****
FLOW PROCESS FROM NODE 60.00 TO NODE 60.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	4.20	9.12	3.934	1.17

LONGEST FLOWPATH FROM NODE 40.00 TO NODE 60.00 = 687.00 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	3.73	6.61	4.844	0.90

LONGEST FLOWPATH FROM NODE 70.00 TO NODE 60.00 = 624.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	6.77	6.61	4.844
2	7.22	9.12	3.934

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 7.22 Tc(MIN.) = 9.12
TOTAL AREA(ACRES) = 2.1

****
FLOW PROCESS FROM NODE 60.00 TO NODE 60.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 2 <<<<<
==========

****
FLOW PROCESS FROM NODE 60.00 TO NODE 140.00 IS CODE = 62

>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STREET TABLE SECTION # 1 USED)<<<<<
==========
UPSTREAM ELEVATION(FEET) = 293.00 DOWNSTREAM ELEVATION(FEET) = 291.87
STREET LENGTH(FEET) = 158.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 10.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 5.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020

```
                OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

          SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
              STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
    Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

       **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.24
                         ***STREET FLOWING FULL***
                STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                       STREET FLOW DEPTH(FEET) =  0.36
                    HALFSTREET FLOOD WIDTH(FEET) =   10.00
                  AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.55
                PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.91
         STREET FLOW TRAVEL TIME(MIN.) =   1.03   Tc(MIN.) =   10.15
               100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.671
                         *USER SPECIFIED(SUBAREA):
                   USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                      S.C.S. CURVE NUMBER (AMC II) =   0
                   AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
      SUBAREA AREA(ACRES) =    0.01      SUBAREA RUNOFF(CFS) =    0.03
    TOTAL AREA(ACRES) =        2.1       PEAK FLOW RATE(CFS) =       7.22

                    END OF SUBAREA STREET FLOW HYDRAULICS:
         DEPTH(FEET) = 0.36   HALFSTREET FLOOD WIDTH(FEET) =  10.00
    FLOW VELOCITY(FEET/SEC.) =  2.55   DEPTH*VELOCITY(FT*FT/SEC.) =   0.91
  LONGEST FLOWPATH FROM NODE     40.00 TO NODE    140.00 =     845.00 FEET.

****************************************************************************
      FLOW PROCESS FROM NODE    140.00 TO NODE    140.00 IS CODE =   1
----------------------------------------------------------------------------
            >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
                         TOTAL NUMBER OF STREAMS =  2
            CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
                    TIME OF CONCENTRATION(MIN.) =   10.15
                     RAINFALL INTENSITY(INCH/HR) =   3.67
                      TOTAL STREAM AREA(ACRES) =     2.09
                  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.22

****************************************************************************
      FLOW PROCESS FROM NODE    150.00 TO NODE    160.00 IS CODE =  22
----------------------------------------------------------------------------
              >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
                         *USER SPECIFIED(SUBAREA):
                   USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                      S.C.S. CURVE NUMBER (AMC II) =   0
                      USER SPECIFIED Tc(MIN.) =    5.000
                100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.796
                         SUBAREA RUNOFF(CFS) =      0.49
        TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.49

****************************************************************************
      FLOW PROCESS FROM NODE    160.00 TO NODE    140.00 IS CODE =  51
----------------------------------------------------------------------------
                >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
            >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    294.85  DOWNSTREAM(FEET) =    291.87
```

CHANNEL LENGTH THRU SUBAREA(FEET) = 115.00 CHANNEL SLOPE = 0.0259
CHANNEL BASE(FEET) = 10.00 "Z" FACTOR = 5.000
MANNING'S FACTOR = 0.015 MAXIMUM DEPTH(FEET) = 2.00
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.161
*USER SPECIFIED(SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = .8500
S.C.S. CURVE NUMBER (AMC II) = 0
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 0.81
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 1.94
AVERAGE FLOW DEPTH(FEET) = 0.04 TRAVEL TIME(MIN.) = 0.99
Tc(MIN.) = 5.99
SUBAREA AREA(ACRES) = 0.15 SUBAREA RUNOFF(CFS) = 0.64
AREA-AVERAGE RUNOFF COEFFICIENT = 0.850
TOTAL AREA(ACRES) = 0.2 PEAK FLOW RATE(CFS) = 1.08

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.05 FLOW VELOCITY(FEET/SEC.) = 2.08
LONGEST FLOWPATH FROM NODE 150.00 TO NODE 140.00 = 15915.00 FEET.

****
FLOW PROCESS FROM NODE 140.00 TO NODE 140.00 IS CODE = 1

>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 5.99
RAINFALL INTENSITY(INCH/HR) = 5.16
TOTAL STREAM AREA(ACRES) = 0.25
PEAK FLOW RATE(CFS) AT CONFLUENCE = 1.08

** CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	7.22	10.15	3.671	2.09
2	1.08	5.99	5.161	0.25

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	5.34	5.99	5.161
2	7.99	10.15	3.671

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 7.99 Tc(MIN.) = 10.15
TOTAL AREA(ACRES) = 2.3
LONGEST FLOWPATH FROM NODE 150.00 TO NODE 140.00 = 15915.00 FEET.

****
FLOW PROCESS FROM NODE 140.00 TO NODE 140.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.671
*USER SPECIFIED(SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = .8500

```
                S.C.S. CURVE NUMBER (AMC II) =   0
             AREA-AVERAGE RUNOFF COEFFICIENT = 0.8500
    SUBAREA AREA(ACRES) =    0.19   SUBAREA RUNOFF(CFS) =    0.60
   TOTAL AREA(ACRES) =        2.5   TOTAL RUNOFF(CFS) =       7.99
                      TC(MIN.) =   10.15
        NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE    140.00 TO NODE    500.00 IS CODE =  62
----------------------------------------------------------------------------
       >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
            >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  291.87  DOWNSTREAM ELEVATION(FEET) =  291.00
    STREET LENGTH(FEET) =    56.00   CURB HEIGHT(INCHES) =  6.0
                  STREET HALFWIDTH(FEET) = 10.00

     DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   5.00
             INSIDE STREET CROSSFALL(DECIMAL) =  0.020
            OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

       SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
           STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
    Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.01
                    ***STREET FLOWING FULL***
          STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                 STREET FLOW DEPTH(FEET) =  0.33
              HALFSTREET FLOOD WIDTH(FEET) =   10.00
            AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.38
          PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.12
     STREET FLOW TRAVEL TIME(MIN.) =   0.28   Tc(MIN.) =   10.43
          100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.608
                    *USER SPECIFIED(SUBAREA):
              USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                 S.C.S. CURVE NUMBER (AMC II) =   0
              AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
   SUBAREA AREA(ACRES) =    0.01      SUBAREA RUNOFF(CFS) =    0.03
 TOTAL AREA(ACRES) =        2.5       PEAK FLOW RATE(CFS) =       7.99

            END OF SUBAREA STREET FLOW HYDRAULICS:
     DEPTH(FEET) = 0.33   HALFSTREET FLOOD WIDTH(FEET) =  10.00
 FLOW VELOCITY(FEET/SEC.) =  3.37   DEPTH*VELOCITY(FT*FT/SEC.) =   1.12
LONGEST FLOWPATH FROM NODE    150.00 TO NODE    500.00 =   15971.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    500.00 TO NODE    500.00 IS CODE =  10
----------------------------------------------------------------------------
       >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    170.00 TO NODE    180.00 IS CODE =  22
----------------------------------------------------------------------------
       >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
                    *USER SPECIFIED(SUBAREA):
              USER-SPECIFIED RUNOFF COEFFICIENT = .8500
```

```
                S.C.S. CURVE NUMBER (AMC II) =   0
                USER SPECIFIED Tc(MIN.) =    5.000
          100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.796
                SUBAREA RUNOFF(CFS) =      0.49
     TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.49

****************************************************************************
      FLOW PROCESS FROM NODE    180.00 TO NODE    500.00 IS CODE =  51
----------------------------------------------------------------------------
            >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
         >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    303.90  DOWNSTREAM(FEET) =    291.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   345.00   CHANNEL SLOPE =  0.0374
          CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   5.000
        MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
          100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.708
                    *USER SPECIFIED(SUBAREA):
               USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                  S.C.S. CURVE NUMBER (AMC II) =   0
       TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.81
      TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.02
      AVERAGE FLOW DEPTH(FEET) =   0.06   TRAVEL TIME(MIN.) =   1.90
                        Tc(MIN.) =    6.90
    SUBAREA AREA(ACRES) =     0.65       SUBAREA RUNOFF(CFS) =    2.62
              AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
  TOTAL AREA(ACRES) =        0.8         PEAK FLOW RATE(CFS) =       3.02

               END OF SUBAREA CHANNEL FLOW HYDRAULICS:
         DEPTH(FEET) =  0.08   FLOW VELOCITY(FEET/SEC.) =   3.58
 LONGEST FLOWPATH FROM NODE    170.00 TO NODE    500.00 =     401.00 FEET.

****************************************************************************
      FLOW PROCESS FROM NODE    500.00 TO NODE    500.00 IS CODE =  10
----------------------------------------------------------------------------
         >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
      FLOW PROCESS FROM NODE    190.00 TO NODE    200.00 IS CODE =  22
----------------------------------------------------------------------------
            >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
                    *USER SPECIFIED(SUBAREA):
               USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                  S.C.S. CURVE NUMBER (AMC II) =   0
                  USER SPECIFIED Tc(MIN.) =    5.000
            100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.796
                  SUBAREA RUNOFF(CFS) =      0.72
       TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.72

****************************************************************************
      FLOW PROCESS FROM NODE    200.00 TO NODE    210.00 IS CODE =  51
----------------------------------------------------------------------------
            >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
         >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    316.00  DOWNSTREAM(FEET) =    304.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   397.00   CHANNEL SLOPE =  0.0302
          CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   5.000
```

```
MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.851
              *USER SPECIFIED(SUBAREA):
          USER-SPECIFIED RUNOFF COEFFICIENT = .8500
             S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.26
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.16
 AVERAGE FLOW DEPTH(FEET) =   0.12   TRAVEL TIME(MIN.) =   1.59
                    Tc(MIN.) =    6.59
 SUBAREA AREA(ACRES) =     2.19       SUBAREA RUNOFF(CFS) =    9.02
          AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
TOTAL AREA(ACRES) =        2.3         PEAK FLOW RATE(CFS) =       9.62

          END OF SUBAREA CHANNEL FLOW HYDRAULICS:
    DEPTH(FEET) =  0.17   FLOW VELOCITY(FEET/SEC.) =   5.13
LONGEST FLOWPATH FROM NODE    190.00 TO NODE    210.00 =     742.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    210.00 TO NODE    220.00 IS CODE =  91
----------------------------------------------------------------------------
    >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
          UPSTREAM NODE ELEVATION(FEET) =    304.00
        DOWNSTREAM NODE ELEVATION(FEET) =    300.40
       CHANNEL LENGTH THRU SUBAREA(FEET) =   271.00
  "V" GUTTER WIDTH(FEET) =   1.50   GUTTER HIKE(FEET) =  0.250
       PAVEMENT LIP(FEET) =  0.100   MANNING'S N = .0150
        PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
                 MAXIMUM DEPTH(FEET) =   2.00
       100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.299
              *USER SPECIFIED(SUBAREA):
          USER-SPECIFIED RUNOFF COEFFICIENT = .8500
             S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      9.64
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.32
 AVERAGE FLOW DEPTH(FEET) =   0.56   FLOOD WIDTH(FEET) =   22.69
 "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.36   Tc(MIN.) =    7.95
 SUBAREA AREA(ACRES) =    0.01       SUBAREA RUNOFF(CFS) =    0.04
          AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
TOTAL AREA(ACRES) =        2.3         PEAK FLOW RATE(CFS) =       9.62

          END OF SUBAREA "V" GUTTER HYDRAULICS:
    DEPTH(FEET) =  0.56   FLOOD WIDTH(FEET) =   22.69
FLOW VELOCITY(FEET/SEC.) =   3.32   DEPTH*VELOCITY(FT*FT/SEC) =   1.86
LONGEST FLOWPATH FROM NODE    190.00 TO NODE    220.00 =    1013.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    220.00 TO NODE    220.00 IS CODE =   1
----------------------------------------------------------------------------
    >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
          TOTAL NUMBER OF STREAMS =  2
    CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
          TIME OF CONCENTRATION(MIN.) =    7.95
           RAINFALL INTENSITY(INCH/HR) =   4.30
            TOTAL STREAM AREA(ACRES) =     2.34
       PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.62

****************************************************************************
 FLOW PROCESS FROM NODE    230.00 TO NODE    240.00 IS CODE =  22
```

```
--------------------------------------------------------------------------
          >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
                        *USER SPECIFIED(SUBAREA):
                 USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                    S.C.S. CURVE NUMBER (AMC II) =   0
                    USER SPECIFIED Tc(MIN.) =    5.000
             100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.796
                      SUBAREA RUNOFF(CFS) =      0.49
       TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.49

**************************************************************************
     FLOW PROCESS FROM NODE    240.00 TO NODE    220.00 IS CODE =  51
--------------------------------------------------------------------------
          >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
        >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    303.90  DOWNSTREAM(FEET) =    300.40
   CHANNEL LENGTH THRU SUBAREA(FEET) =   210.00   CHANNEL SLOPE =  0.0167
            CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   5.000
         MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
             100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.790
                        *USER SPECIFIED(SUBAREA):
                 USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                    S.C.S. CURVE NUMBER (AMC II) =   0
       TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.22
      TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.04
      AVERAGE FLOW DEPTH(FEET) =   0.06   TRAVEL TIME(MIN.) =   1.72
                           Tc(MIN.) =    6.72
    SUBAREA AREA(ACRES) =     0.36       SUBAREA RUNOFF(CFS) =    1.45
                AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
   TOTAL AREA(ACRES) =        0.5         PEAK FLOW RATE(CFS) =       1.86

                END OF SUBAREA CHANNEL FLOW HYDRAULICS:
          DEPTH(FEET) =  0.08   FLOW VELOCITY(FEET/SEC.) =   2.26
  LONGEST FLOWPATH FROM NODE    230.00 TO NODE    220.00 =     481.00 FEET.

**************************************************************************
     FLOW PROCESS FROM NODE    220.00 TO NODE    220.00 IS CODE =  81
--------------------------------------------------------------------------
          >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
             100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.790
                        *USER SPECIFIED(SUBAREA):
                 USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                    S.C.S. CURVE NUMBER (AMC II) =   0
                AREA-AVERAGE RUNOFF COEFFICIENT = 0.8500
       SUBAREA AREA(ACRES) =    0.49   SUBAREA RUNOFF(CFS) =    2.00
      TOTAL AREA(ACRES) =        0.9   TOTAL RUNOFF(CFS) =       3.86
                          TC(MIN.) =    6.72

**************************************************************************
     FLOW PROCESS FROM NODE    220.00 TO NODE    220.00 IS CODE =   1
--------------------------------------------------------------------------
          >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
        >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==========================================================================
                       TOTAL NUMBER OF STREAMS =  2
          CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
                  TIME OF CONCENTRATION(MIN.) =    6.72
```

RAINFALL INTENSITY(INCH/HR) = 4.79
TOTAL STREAM AREA(ACRES) = 0.95
PEAK FLOW RATE(CFS) AT CONFLUENCE = 3.86

** CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	9.62	7.95	4.299	2.34
2	3.86	6.72	4.790	0.95

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	12.00	6.72	4.790
2	13.09	7.95	4.299

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 13.09 Tc(MIN.) = 7.95
TOTAL AREA(ACRES) = 3.3
LONGEST FLOWPATH FROM NODE 190.00 TO NODE 220.00 = 1013.00 FEET.

****
FLOW PROCESS FROM NODE 220.00 TO NODE 500.00 IS CODE = 62

>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STREET TABLE SECTION # 1 USED)<<<<<
==
UPSTREAM ELEVATION(FEET) = 300.40 DOWNSTREAM ELEVATION(FEET) = 291.00
STREET LENGTH(FEET) = 290.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 10.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 5.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0130
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 13.11
STREET FLOWING FULL
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.34
HALFSTREET FLOOD WIDTH(FEET) = 10.00
AVERAGE FLOW VELOCITY(FEET/SEC.) = 5.11
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.75
STREET FLOW TRAVEL TIME(MIN.) = 0.95 Tc(MIN.) = 8.89
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.998
*USER SPECIFIED(SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = .8500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.850
SUBAREA AREA(ACRES) = 0.01 SUBAREA RUNOFF(CFS) = 0.03
TOTAL AREA(ACRES) = 3.3 PEAK FLOW RATE(CFS) = 13.09

END OF SUBAREA STREET FLOW HYDRAULICS:

```
        DEPTH(FEET) = 0.34   HALFSTREET FLOOD WIDTH(FEET) =  10.00
  FLOW VELOCITY(FEET/SEC.) =  5.10   DEPTH*VELOCITY(FT*FT/SEC.) =   1.75
 LONGEST FLOWPATH FROM NODE    190.00 TO NODE    500.00 =    1303.00 FEET.

****************************************************************************
      FLOW PROCESS FROM NODE    500.00 TO NODE    500.00 IS CODE =  11
----------------------------------------------------------------------------
      >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

                    ** MAIN STREAM CONFLUENCE DATA **
             STREAM     RUNOFF      Tc      INTENSITY     AREA
             NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
               1       13.09     8.89       3.998        3.30
 LONGEST FLOWPATH FROM NODE    190.00 TO NODE    500.00 =    1303.00 FEET.

                  ** MEMORY BANK #  1 CONFLUENCE DATA **
             STREAM     RUNOFF      Tc      INTENSITY     AREA
             NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
               1        7.99    10.43       3.608        2.54
 LONGEST FLOWPATH FROM NODE    150.00 TO NODE    500.00 =   15971.00 FEET.

                       ** PEAK FLOW RATE TABLE **
                  STREAM    RUNOFF       Tc      INTENSITY
                  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
                    1      19.91       8.89        3.998
                    2      19.81      10.43        3.608

              COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
          PEAK FLOW RATE(CFS) =      19.91   Tc(MIN.) =    8.89
                    TOTAL AREA(ACRES) =        5.8

****************************************************************************
      FLOW PROCESS FROM NODE    500.00 TO NODE    500.00 IS CODE =  12
----------------------------------------------------------------------------
                      >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
      FLOW PROCESS FROM NODE    500.00 TO NODE    500.00 IS CODE =  11
----------------------------------------------------------------------------
      >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

                    ** MAIN STREAM CONFLUENCE DATA **
             STREAM     RUNOFF      Tc      INTENSITY     AREA
             NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
               1       19.91     8.89       3.998        5.84
 LONGEST FLOWPATH FROM NODE    150.00 TO NODE    500.00 =   15971.00 FEET.

                  ** MEMORY BANK #  2 CONFLUENCE DATA **
             STREAM     RUNOFF      Tc      INTENSITY     AREA
             NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
               1        3.02     6.90       4.708        0.75
 LONGEST FLOWPATH FROM NODE    170.00 TO NODE    500.00 =     401.00 FEET.

                       ** PEAK FLOW RATE TABLE **
                  STREAM    RUNOFF       Tc      INTENSITY
                  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
                    1      18.47       6.90        4.708
```

```
    2      22.47       8.89        3.998

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =      22.47   Tc(MIN.) =    8.89
            TOTAL AREA(ACRES) =        6.6

****************************************************************************
      FLOW PROCESS FROM NODE    500.00 TO NODE    500.00 IS CODE =  12
----------------------------------------------------------------------------
                     >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================
============================================================================
                          END OF STUDY SUMMARY:
         TOTAL AREA(ACRES)     =         6.6  TC(MIN.) =      8.89
                    PEAK FLOW RATE(CFS)    =      22.47
============================================================================
============================================================================
                      END OF RATIONAL METHOD ANALYSIS
```

APPENDIX B

AES CALCULATIONS

POST-DEVELOPMENT

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

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2012 Advanced Engineering Software (aes)
              Ver. 19.0 Release Date: 06/01/2012  License ID 1503

                              Analysis prepared by:

                                 LANDMARK CONSULTING
                              9555 GENESEE AVE. SUITE 200
                                 SAN DIEGO, CA 92121
                          TEL:  858-587-8070, FAX:  858-587-8750

 ************************** DESCRIPTION OF STUDY **************************
* CLAIREMONT VILLAGE                                                      *
* 100 YEAR STORM                                                          *
* POST DEVELOPMENT CONDITIONS                                             *
 **************************************************************************

  FILE NAME: CVP100.DAT
  TIME/DATE OF STUDY: 10:31 09/10/2021
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.200
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   4.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *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    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0150

  GLOBAL STREET FLOW-DEPTH CONSTRAINTS:
    1. Relative Flow-Depth =  1.00 FEET
       as (Maximum Allowable Street Flow Depth) - (Top-of-Curb)
    2. (Depth)*(Velocity) Constraint = 10.0 (FT*FT/S)
  *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
   OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
  FLOW PROCESS FROM NODE     10.00 TO NODE     10.10 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .7900
  SOIL CLASSIFICATION IS "D"
  S.C.S. CURVE NUMBER (AMC II) =  94
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    327.00
  DOWNSTREAM ELEVATION(FEET) =    324.00
```

```
  ELEVATION DIFFERENCE(FEET) =      3.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.567
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    85.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.796
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.32
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.32

****************************************************************************
  FLOW PROCESS FROM NODE     10.10 TO NODE     10.20 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    324.00  DOWNSTREAM(FEET) =    311.00
  CHANNEL LENGTH THRU SUBAREA(FEET) =   345.00   CHANNEL SLOPE =  0.0377
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.302
  *USER SPECIFIED(SUBAREA):
  STREETS & ROADS (DIRT) RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =  94
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.64
  AVERAGE FLOW DEPTH(FEET) =   0.06   TRAVEL TIME(MIN.) =   2.17
  Tc(MIN.) =    5.74
  SUBAREA AREA(ACRES) =     0.28       SUBAREA RUNOFF(CFS) =    1.26
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.838
  TOTAL AREA(ACRES) =        0.3         PEAK FLOW RATE(CFS) =       1.56

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.08   FLOW VELOCITY(FEET/SEC.) =   3.30
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     10.20 =     445.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     10.20 TO NODE     10.30 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   303.00  DOWNSTREAM(FEET) =   301.65
  FLOW LENGTH(FEET) =   135.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   7.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.15
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.56
  PIPE TRAVEL TIME(MIN.) =   0.54    Tc(MIN.) =    6.28
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     10.30 =     580.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     10.30 TO NODE     10.30 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.002
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8500
```

```
  S.C.S. CURVE NUMBER (AMC II) =  94
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8438
  SUBAREA AREA(ACRES) =    0.33   SUBAREA RUNOFF(CFS) =    1.40
  TOTAL AREA(ACRES) =        0.7   TOTAL RUNOFF(CFS) =       2.87
  TC(MIN.) =    6.28

****************************************************************************
  FLOW PROCESS FROM NODE     10.30 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) =   301.65  DOWNSTREAM(FEET) =   299.05
  FLOW LENGTH(FEET) =   260.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   8.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.94
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.87
  PIPE TRAVEL TIME(MIN.) =   0.88    Tc(MIN.) =    7.16
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     20.00 =     840.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     20.00 TO NODE     20.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.597
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =  94
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8456
  SUBAREA AREA(ACRES) =    0.28   SUBAREA RUNOFF(CFS) =    1.09
  TOTAL AREA(ACRES) =        1.0   TOTAL RUNOFF(CFS) =       3.73
  TC(MIN.) =    7.16

****************************************************************************
  FLOW PROCESS FROM NODE     20.00 TO NODE     30.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   299.05  DOWNSTREAM(FEET) =   298.74
  FLOW LENGTH(FEET) =    31.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.35
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.73
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =    7.26
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     30.00 =     871.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE     30.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     40.00 TO NODE     50.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
==========================================================================
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =  94
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    55.00
  UPSTREAM ELEVATION(FEET) =    310.00
  DOWNSTREAM ELEVATION(FEET) =    309.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.734
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.796
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.44
  TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.44

**************************************************************************
  FLOW PROCESS FROM NODE     50.00 TO NODE     60.00 IS CODE =  62
--------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
==========================================================================
  UPSTREAM ELEVATION(FEET) =  309.00  DOWNSTREAM ELEVATION(FEET) =  306.00
  STREET LENGTH(FEET) =   105.00   CURB HEIGHT(INCHES) =  6.0
  STREET HALFWIDTH(FEET) = 30.00

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

  SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
  STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
  Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0150
  Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.91
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.22
    HALFSTREET FLOOD WIDTH(FEET) =    4.59
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.77
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.60
  STREET FLOW TRAVEL TIME(MIN.) =   0.63   Tc(MIN.) =    3.37
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.796
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =  94
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
  SUBAREA AREA(ACRES) =    0.19      SUBAREA RUNOFF(CFS) =    0.94
  TOTAL AREA(ACRES) =        0.3        PEAK FLOW RATE(CFS) =       1.38

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.24   HALFSTREET FLOOD WIDTH(FEET) =   5.85
  FLOW VELOCITY(FEET/SEC.) =  3.00   DEPTH*VELOCITY(FT*FT/SEC.) =   0.73
  LONGEST FLOWPATH FROM NODE     40.00 TO NODE     60.00 =     160.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE     60.00 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) =   304.00  DOWNSTREAM(FEET) =   303.00
  FLOW LENGTH(FEET) =    87.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   6.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.35
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.38
  PIPE TRAVEL TIME(MIN.) =   0.33    Tc(MIN.) =    3.70
  LONGEST FLOWPATH FROM NODE     40.00 TO NODE     70.00 =     247.00 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.) =    3.70
  RAINFALL INTENSITY(INCH/HR) =   5.80
  TOTAL STREAM AREA(ACRES) =     0.28
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.38

****************************************************************************
  FLOW PROCESS FROM NODE     80.00 TO NODE     80.10 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (43. DU/AC OR LESS) RUNOFF COEFFICIENT = .7000
  S.C.S. CURVE NUMBER (AMC II) =  94
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    40.00
  UPSTREAM ELEVATION(FEET) =    317.00
  DOWNSTREAM ELEVATION(FEET) =    316.60
  ELEVATION DIFFERENCE(FEET) =      0.40
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.554
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.796
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.16
  TOTAL AREA(ACRES) =      0.04   TOTAL RUNOFF(CFS) =      0.16

****************************************************************************
  FLOW PROCESS FROM NODE     80.10 TO NODE     90.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    316.60  DOWNSTREAM(FEET) =    311.60
  CHANNEL LENGTH THRU SUBAREA(FEET) =   495.00   CHANNEL SLOPE =  0.0101
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.297
  *USER SPECIFIED(SUBAREA):
  RESIDENTIAL (43. DU/AC OR LESS) RUNOFF COEFFICIENT = .7000
  S.C.S. CURVE NUMBER (AMC II) =  94
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.43
  AVERAGE FLOW DEPTH(FEET) =   0.15   TRAVEL TIME(MIN.) =   3.40
  Tc(MIN.) =    7.95
  SUBAREA AREA(ACRES) =     1.43       SUBAREA RUNOFF(CFS) =    4.30
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.700
  TOTAL AREA(ACRES) =       1.5         PEAK FLOW RATE(CFS) =       4.42
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.21   FLOW VELOCITY(FEET/SEC.) =   2.95
  LONGEST FLOWPATH FROM NODE     80.00 TO NODE     90.00 =     535.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     90.00 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) =   303.00  DOWNSTREAM(FEET) =   302.50
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   9.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.55
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.42
  PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =    8.10
  LONGEST FLOWPATH FROM NODE     80.00 TO NODE     70.00 =     585.00 FEET.

****************************************************************************
  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.) =    8.10
  RAINFALL INTENSITY(INCH/HR) =   4.25
  TOTAL STREAM AREA(ACRES) =     1.47
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.42

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER       (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1         1.38     3.70        5.796          0.28
      2         4.42     8.10        4.246          1.47

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER       (CFS)    (MIN.)   (INCH/HOUR)
      1         3.40     3.70       5.796
      2         5.43     8.10       4.246

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       5.43   Tc(MIN.) =    8.10
  TOTAL AREA(ACRES) =        1.7
  LONGEST FLOWPATH FROM NODE     80.00 TO NODE     70.00 =     585.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     30.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   300.00  DOWNSTREAM(FEET) =   298.23
```

```
  FLOW LENGTH(FEET) =   177.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS  10.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.77
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.43
  PIPE TRAVEL TIME(MIN.) =   0.51    Tc(MIN.) =    8.61
  LONGEST FLOWPATH FROM NODE     80.00 TO NODE     30.00 =     762.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE     30.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        5.43     8.61       4.082        1.75
  LONGEST FLOWPATH FROM NODE     80.00 TO NODE     30.00 =     762.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        3.73     7.26       4.558        0.96
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     30.00 =     871.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1       8.31       7.26        4.558
      2       8.77       8.61        4.082

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       8.77   Tc(MIN.) =    8.61
  TOTAL AREA(ACRES) =        2.7

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE     30.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE    110.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   298.23  DOWNSTREAM(FEET) =   297.35
  FLOW LENGTH(FEET) =    97.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.25
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.77
  PIPE TRAVEL TIME(MIN.) =   0.26    Tc(MIN.) =    8.87
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE    110.00 =     968.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 IS CODE =  10
----------------------------------------------------------------------------
```

```
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
================================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    120.00 TO NODE    120.10 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =  94
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    63.00
  UPSTREAM ELEVATION(FEET) =    304.60
  DOWNSTREAM ELEVATION(FEET) =    304.30
  ELEVATION DIFFERENCE(FEET) =      0.30
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.009
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    50.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.796
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.34
  TOTAL AREA(ACRES) =      0.07   TOTAL RUNOFF(CFS) =      0.34

****************************************************************************
  FLOW PROCESS FROM NODE    120.10 TO NODE    120.20 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    304.30  DOWNSTREAM(FEET) =    303.28
  CHANNEL LENGTH THRU SUBAREA(FEET) =   100.00   CHANNEL SLOPE =  0.0102
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.796
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =  94
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.60
  AVERAGE FLOW DEPTH(FEET) =   0.16   TRAVEL TIME(MIN.) =   0.64
  Tc(MIN.) =    4.65
  SUBAREA AREA(ACRES) =     0.95       SUBAREA RUNOFF(CFS) =    4.68
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
  TOTAL AREA(ACRES) =        1.0         PEAK FLOW RATE(CFS) =       5.03

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.22   FLOW VELOCITY(FEET/SEC.) =   3.10
  LONGEST FLOWPATH FROM NODE    120.00 TO NODE    120.20 =     163.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    120.20 TO NODE    120.20 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.796
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
```

```
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =  94
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8500
  SUBAREA AREA(ACRES) =    0.13   SUBAREA RUNOFF(CFS) =    0.64
  TOTAL AREA(ACRES) =        1.1   TOTAL RUNOFF(CFS) =       5.67
  TC(MIN.) =    4.65

****************************************************************************
  FLOW PROCESS FROM NODE    120.20 TO NODE    110.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   302.24  DOWNSTREAM(FEET) =   300.00
  FLOW LENGTH(FEET) =   211.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS  10.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.96
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.67
  PIPE TRAVEL TIME(MIN.) =   0.59    Tc(MIN.) =    5.24
  LONGEST FLOWPATH FROM NODE    120.00 TO NODE    110.00 =     374.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.623
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =  94
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8500
  SUBAREA AREA(ACRES) =    0.33   SUBAREA RUNOFF(CFS) =    1.58
  TOTAL AREA(ACRES) =        1.5   TOTAL RUNOFF(CFS) =       7.07
  TC(MIN.) =    5.24

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    100.10 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =  94
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    30.00
  UPSTREAM ELEVATION(FEET) =    304.60
  DOWNSTREAM ELEVATION(FEET) =    304.30
  ELEVATION DIFFERENCE(FEET) =      0.30
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.465
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.796
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.44
  TOTAL AREA(ACRES) =      0.09   TOTAL RUNOFF(CFS) =      0.44
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    100.10 TO NODE    110.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    304.30  DOWNSTREAM(FEET) =    303.70
  CHANNEL LENGTH THRU SUBAREA(FEET) =   335.00   CHANNEL SLOPE =  0.0018
  CHANNEL BASE(FEET) =    5.00   "Z" FACTOR =  10.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   5.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.695
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =  94
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.87
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.25
  AVERAGE FLOW DEPTH(FEET) =   0.21   TRAVEL TIME(MIN.) =   4.47
  Tc(MIN.) =    6.93
  SUBAREA AREA(ACRES) =     0.70       SUBAREA RUNOFF(CFS) =    2.79
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
  TOTAL AREA(ACRES) =        0.8         PEAK FLOW RATE(CFS) =       3.15

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.28   FLOW VELOCITY(FEET/SEC.) =   1.46
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    110.00 =     365.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        3.15     6.93       4.695        0.79
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    110.00 =     365.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        8.77     8.87       4.004        2.71
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE    110.00 =     968.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      10.01       6.93        4.695
      2      11.46       8.87        4.004

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      11.46   Tc(MIN.) =    8.87
  TOTAL AREA(ACRES) =        3.5

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       11.46     8.87       4.004        3.50
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE    110.00 =     968.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        7.07     5.24       5.623        1.48
  LONGEST FLOWPATH FROM NODE    120.00 TO NODE    110.00 =     374.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      13.85       5.24        5.623
      2      16.50       8.87        4.004

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      16.50   Tc(MIN.) =    8.87
  TOTAL AREA(ACRES) =        5.0

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    110.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    140.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   297.35  DOWNSTREAM(FEET) =   293.98
  FLOW LENGTH(FEET) =   250.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.46
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      16.50
  PIPE TRAVEL TIME(MIN.) =   0.49    Tc(MIN.) =    9.36
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE    140.00 =    1218.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    140.00 TO NODE    140.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    150.00 TO NODE    150.10 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
```

```
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =  94
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =    304.00
  DOWNSTREAM ELEVATION(FEET) =    303.52
  ELEVATION DIFFERENCE(FEET) =      0.48
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.009
  WARNING: INITIAL SUBAREA FLOW PATH LENGTH IS GREATER THAN
           THE MAXIMUM OVERLAND FLOW LENGTH =    50.00
           (Reference: Table 3-1B of Hydrology Manual)
           THE MAXIMUM OVERLAND FLOW LENGTH IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.796
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.43
  TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      1.43

****************************************************************************
  FLOW PROCESS FROM NODE    150.10 TO NODE    150.20 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   297.33  DOWNSTREAM(FEET) =   296.57
  FLOW LENGTH(FEET) =    29.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   4.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.03
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.43
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    4.09
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    150.20 =     129.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    150.20 TO NODE    150.20 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    150.30 TO NODE    150.30 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =  94
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    20.00
  UPSTREAM ELEVATION(FEET) =    301.70
  DOWNSTREAM ELEVATION(FEET) =    301.50
  ELEVATION DIFFERENCE(FEET) =      0.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.012
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.796
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.25
  TOTAL AREA(ACRES) =      0.05   TOTAL RUNOFF(CFS) =      0.25

****************************************************************************
  FLOW PROCESS FROM NODE    150.30 TO NODE    150.20 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   301.50  DOWNSTREAM(FEET) =   297.02
  FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.013
  ESTIMATED PIPE DIAMETER(INCH) INCREASED TO  4.000
  DEPTH OF FLOW IN   4.0 INCH PIPE IS   1.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.43
  ESTIMATED PIPE DIAMETER(INCH) =   4.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.25
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =    2.08
  LONGEST FLOWPATH FROM NODE    150.30 TO NODE    150.20 =      50.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    150.20 TO NODE    150.20 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
      1        0.25     2.08       5.796        0.05
  LONGEST FLOWPATH FROM NODE    150.30 TO NODE    150.20 =      50.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
      1        1.43     4.09       5.796        0.29
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    150.20 =     129.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1       0.97       2.08        5.796
      2       1.68       4.09        5.796

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       1.68   Tc(MIN.) =    4.09
  TOTAL AREA(ACRES) =        0.3

****************************************************************************
  FLOW PROCESS FROM NODE    150.20 TO NODE    150.20 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    150.20 TO NODE    160.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   296.57  DOWNSTREAM(FEET) =   295.61
  FLOW LENGTH(FEET) =    34.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   5.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.47
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.68
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =    4.18
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    160.00 =     163.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    160.00 TO NODE    160.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.796
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =  94
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8500
  SUBAREA AREA(ACRES) =    0.19   SUBAREA RUNOFF(CFS) =    0.94
  TOTAL AREA(ACRES) =        0.5   TOTAL RUNOFF(CFS) =       2.61
  TC(MIN.) =    4.18

****************************************************************************
  FLOW PROCESS FROM NODE    160.00 TO NODE    170.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   295.61  DOWNSTREAM(FEET) =   294.89
  FLOW LENGTH(FEET) =    27.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   7.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.79
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.61
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =    4.24
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    170.00 =     190.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    170.00 TO NODE    140.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   294.89  DOWNSTREAM(FEET) =   294.48
  FLOW LENGTH(FEET) =    22.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.19
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.61
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =    4.30
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    140.00 =     212.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    140.00 TO NODE    140.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER       (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
      1         2.61     4.30       5.796        0.53
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    140.00 =     212.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
```

```
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       16.50      9.36       3.867         4.98
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE    140.00 =    1218.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc       INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      10.19       4.30        5.796
      2      18.24       9.36        3.867

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      18.24   Tc(MIN.) =    9.36
  TOTAL AREA(ACRES) =        5.5

****************************************************************************
  FLOW PROCESS FROM NODE    140.00 TO NODE    140.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    140.00 TO NODE    190.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   293.48  DOWNSTREAM(FEET) =   292.97
  FLOW LENGTH(FEET) =    79.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.70
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      18.24
  PIPE TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =    9.56
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE    190.00 =    1297.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    190.00 TO NODE    190.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.816
  *USER SPECIFIED(SUBAREA):
  NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8500
  S.C.S. CURVE NUMBER (AMC II) =  94
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8116
  SUBAREA AREA(ACRES) =    0.34   SUBAREA RUNOFF(CFS) =    1.10
  TOTAL AREA(ACRES) =        5.9   TOTAL RUNOFF(CFS) =      18.24
  TC(MIN.) =    9.56
  NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE    190.00 TO NODE    200.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   292.97  DOWNSTREAM(FEET) =   292.73
  FLOW LENGTH(FEET) =    37.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.71
```

```
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      18.24
 PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =    9.65
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE    200.00 =    1334.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    200.00 TO NODE    130.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =   292.73  DOWNSTREAM(FEET) =   291.94
 FLOW LENGTH(FEET) =   121.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.73
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      18.24
 PIPE TRAVEL TIME(MIN.) =   0.30    Tc(MIN.) =    9.95
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE    130.00 =    1455.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    130.00 TO NODE    130.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.718
 *USER SPECIFIED(SUBAREA):
 NEIGHBORHOOD COMMERCIAL RUNOFF COEFFICIENT = .8500
 S.C.S. CURVE NUMBER (AMC II) =  94
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.8120
 SUBAREA AREA(ACRES) =    0.07   SUBAREA RUNOFF(CFS) =    0.22
 TOTAL AREA(ACRES) =        5.9   TOTAL RUNOFF(CFS) =      18.24
 TC(MIN.) =    9.95
 NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =        5.9  TC(MIN.) =      9.95
 PEAK FLOW RATE(CFS)   =      18.24
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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

          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
          Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                     2003,1985,1981 HYDROLOGY MANUAL
       (c) Copyright 1982-2012 Advanced Engineering Software (aes)
           Ver. 19.0 Release Date: 06/01/2012  License ID 1503

                          Analysis prepared by:

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 ************************** DESCRIPTION OF STUDY **************************
* 325-17 CLAIREMONT VILLAGE                                               *
* WESTERLY POC 2 ANALYSIS                                                 *
* DOES NOT CONFLUENCE WITH PROJECT SITE                                   *
 **************************************************************************

                          FILE NAME: 325E100.DAT
                       TIME/DATE OF STUDY: 16:50 04/20/2022
--------------------------------------------------------------------------
          USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
                        2003 SAN DIEGO MANUAL CRITERIA

                  USER SPECIFIED STORM EVENT(YEAR) = 100.00
                6-HOUR DURATION PRECIPITATION (INCHES) =   2.200
                  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
       SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
    NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *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   10.0      5.0    0.020/0.020/0.020   0.50    1.50 0.0313 0.125 0.0130

                    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 = 10.0 (FT*FT/S)
                     *SIZE PIPE WITH A FLOW CAPACITY GREATER THAN
                      OR EQUAL TO THE UPSTREAM TRIBUTARY PIPE.*

**************************************************************************
      FLOW PROCESS FROM NODE     10.00 TO NODE     20.00 IS CODE =  22
--------------------------------------------------------------------------
             >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
                        *USER SPECIFIED(SUBAREA):
                  USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                     S.C.S. CURVE NUMBER (AMC II) =   0
                     USER SPECIFIED Tc(MIN.) =    5.000
               100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.796
                        SUBAREA RUNOFF(CFS) =      0.25
```

```
      TOTAL AREA(ACRES) =      0.05   TOTAL RUNOFF(CFS) =      0.25

****************************************************************************
      FLOW PROCESS FROM NODE     20.00 TO NODE     30.00 IS CODE =  51
----------------------------------------------------------------------------
               >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
            >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    298.94  DOWNSTREAM(FEET) =    296.75
   CHANNEL LENGTH THRU SUBAREA(FEET) =   146.00   CHANNEL SLOPE =  0.0150
            CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   5.000
          MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
              100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.773
                        *USER SPECIFIED(SUBAREA):
                  USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                     S.C.S. CURVE NUMBER (AMC II) =   0
        TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.58
       TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.38
       AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   1.76
                           Tc(MIN.) =    6.76
     SUBAREA AREA(ACRES) =     0.16       SUBAREA RUNOFF(CFS) =    0.65
                  AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
   TOTAL AREA(ACRES) =        0.2         PEAK FLOW RATE(CFS) =       0.86

                  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
          DEPTH(FEET) =  0.05   FLOW VELOCITY(FEET/SEC.) =   1.65
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     30.00 =     146.00 FEET.

****************************************************************************
      FLOW PROCESS FROM NODE     30.00 TO NODE     30.00 IS CODE =  81
----------------------------------------------------------------------------
            >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
              100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.773
                        *USER SPECIFIED(SUBAREA):
                  USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                     S.C.S. CURVE NUMBER (AMC II) =   0
                  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8500
       SUBAREA AREA(ACRES) =    0.25   SUBAREA RUNOFF(CFS) =    1.00
      TOTAL AREA(ACRES) =        0.5   TOTAL RUNOFF(CFS) =       1.86
                           TC(MIN.) =    6.76

****************************************************************************
      FLOW PROCESS FROM NODE     30.00 TO NODE     30.00 IS CODE =   1
----------------------------------------------------------------------------
            >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
                        TOTAL NUMBER OF STREAMS =  2
            CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
                    TIME OF CONCENTRATION(MIN.) =    6.76
                     RAINFALL INTENSITY(INCH/HR) =   4.77
                      TOTAL STREAM AREA(ACRES) =     0.46
                PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.86

****************************************************************************
      FLOW PROCESS FROM NODE     40.00 TO NODE     50.00 IS CODE =  22
----------------------------------------------------------------------------
            >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
                        *USER SPECIFIED(SUBAREA):
```

USER-SPECIFIED RUNOFF COEFFICIENT = .8500
S.C.S. CURVE NUMBER (AMC II) = 0
USER SPECIFIED Tc(MIN.) = 5.000
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.796
SUBAREA RUNOFF(CFS) = 0.27
TOTAL AREA(ACRES) = 0.05 TOTAL RUNOFF(CFS) = 0.27

****
FLOW PROCESS FROM NODE 50.00 TO NODE 30.00 IS CODE = 51

>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========
ELEVATION DATA: UPSTREAM(FEET) = 303.66 DOWNSTREAM(FEET) = 302.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 232.00 CHANNEL SLOPE = 0.0072
CHANNEL BASE(FEET) = 10.00 "Z" FACTOR = 5.000
MANNING'S FACTOR = 0.015 MAXIMUM DEPTH(FEET) = 2.00
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.332
*USER SPECIFIED(SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = .8500
S.C.S. CURVE NUMBER (AMC II) = 0
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 1.00
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 1.36
AVERAGE FLOW DEPTH(FEET) = 0.07 TRAVEL TIME(MIN.) = 2.85
Tc(MIN.) = 7.85
SUBAREA AREA(ACRES) = 0.39 SUBAREA RUNOFF(CFS) = 1.44
AREA-AVERAGE RUNOFF COEFFICIENT = 0.850
TOTAL AREA(ACRES) = 0.4 PEAK FLOW RATE(CFS) = 1.64

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.09 FLOW VELOCITY(FEET/SEC.) = 1.66
LONGEST FLOWPATH FROM NODE 40.00 TO NODE 30.00 = 378.00 FEET.

****
FLOW PROCESS FROM NODE 30.00 TO NODE 30.00 IS CODE = 1

>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==========
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 7.85
RAINFALL INTENSITY(INCH/HR) = 4.33
TOTAL STREAM AREA(ACRES) = 0.45
PEAK FLOW RATE(CFS) AT CONFLUENCE = 1.64

** CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	1.86	6.76	4.773	0.46
2	1.64	7.85	4.332	0.45

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	3.27	6.76	4.773
2	3.33	7.85	4.332

```
          COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
       PEAK FLOW RATE(CFS) =       3.33   Tc(MIN.) =    7.85
                  TOTAL AREA(ACRES) =        0.9
 LONGEST FLOWPATH FROM NODE     40.00 TO NODE     30.00 =     378.00 FEET.

****************************************************************************
     FLOW PROCESS FROM NODE     30.00 TO NODE     60.00 IS CODE =  62
----------------------------------------------------------------------------
          >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
               >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  302.00  DOWNSTREAM ELEVATION(FEET) =  293.00
       STREET LENGTH(FEET) =   309.00   CURB HEIGHT(INCHES) =  6.0
                  STREET HALFWIDTH(FEET) = 10.00

        DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   5.00
                INSIDE STREET CROSSFALL(DECIMAL) =  0.020
               OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

           SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
               STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
    Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

       **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.35
             STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                   STREET FLOW DEPTH(FEET) =  0.29
                 HALFSTREET FLOOD WIDTH(FEET) =    8.40
               AVERAGE FLOW VELOCITY(FEET/SEC.) =    4.06
             PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.20
        STREET FLOW TRAVEL TIME(MIN.) =   1.27   Tc(MIN.) =    9.12
             100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.934
                       *USER SPECIFIED(SUBAREA):
                  USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                     S.C.S. CURVE NUMBER (AMC II) =   0
                  AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
    SUBAREA AREA(ACRES) =    0.01      SUBAREA RUNOFF(CFS) =    0.04
  TOTAL AREA(ACRES) =        0.9       PEAK FLOW RATE(CFS) =       3.33

                  END OF SUBAREA STREET FLOW HYDRAULICS:
       DEPTH(FEET) = 0.29   HALFSTREET FLOOD WIDTH(FEET) =   8.40
  FLOW VELOCITY(FEET/SEC.) =  4.04   DEPTH*VELOCITY(FT*FT/SEC.) =   1.19
 LONGEST FLOWPATH FROM NODE     40.00 TO NODE     60.00 =     687.00 FEET.

****************************************************************************
     FLOW PROCESS FROM NODE     60.00 TO NODE     60.00 IS CODE =  10
----------------------------------------------------------------------------
          >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
     FLOW PROCESS FROM NODE     70.00 TO NODE     80.00 IS CODE =  22
----------------------------------------------------------------------------
          >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
                       *USER SPECIFIED(SUBAREA):
                  USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                     S.C.S. CURVE NUMBER (AMC II) =   0
                     USER SPECIFIED Tc(MIN.) =    5.000
```

```
100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.796
SUBAREA RUNOFF(CFS) =      0.28
TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.28

****************************************************************************
FLOW PROCESS FROM NODE     80.00 TO NODE     90.00 IS CODE =  51
----------------------------------------------------------------------------
>>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
>>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
ELEVATION DATA: UPSTREAM(FEET) =    303.90  DOWNSTREAM(FEET) =    300.61
CHANNEL LENGTH THRU SUBAREA(FEET) =   139.00   CHANNEL SLOPE =  0.0237
CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   5.000
MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.051
*USER SPECIFIED(SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = .8500
S.C.S. CURVE NUMBER (AMC II) =   0
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.85
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.95
AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   1.19
Tc(MIN.) =    6.19
SUBAREA AREA(ACRES) =     0.27       SUBAREA RUNOFF(CFS) =    1.15
AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
TOTAL AREA(ACRES) =        0.3         PEAK FLOW RATE(CFS) =       1.40

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) =  0.06   FLOW VELOCITY(FEET/SEC.) =   2.33
LONGEST FLOWPATH FROM NODE     70.00 TO NODE     90.00 =     448.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE     90.00 TO NODE     90.10 IS CODE =  91
----------------------------------------------------------------------------
>>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
UPSTREAM NODE ELEVATION(FEET) =    300.61
DOWNSTREAM NODE ELEVATION(FEET) =    293.66
CHANNEL LENGTH THRU SUBAREA(FEET) =   166.00
"V" GUTTER WIDTH(FEET) =   1.50   GUTTER HIKE(FEET) =  0.250
PAVEMENT LIP(FEET) =  0.100   MANNING'S N = .0150
PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
MAXIMUM DEPTH(FEET) =   1.00
100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.845
*USER SPECIFIED(SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = .8500
S.C.S. CURVE NUMBER (AMC II) =   0
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      1.42
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.69
AVERAGE FLOW DEPTH(FEET) =   0.35   FLOOD WIDTH(FEET) =    1.50
"V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.41   Tc(MIN.) =    6.60
SUBAREA AREA(ACRES) =    0.01       SUBAREA RUNOFF(CFS) =    0.04
AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
TOTAL AREA(ACRES) =        0.3         PEAK FLOW RATE(CFS) =       1.40

NOTE:TRAVEL TIME ESTIMATES BASED ON NORMAL
DEPTH EQUAL TO [GUTTER-HIKE + PAVEMENT LIP]

END OF SUBAREA "V" GUTTER HYDRAULICS:
DEPTH(FEET) =  0.35   FLOOD WIDTH(FEET) =    1.50
FLOW VELOCITY(FEET/SEC.) =   6.69   DEPTH*VELOCITY(FT*FT/SEC) =   2.34
```

```
 LONGEST FLOWPATH FROM NODE     70.00 TO NODE     90.10 =     614.00 FEET.

****************************************************************************
      FLOW PROCESS FROM NODE     90.10 TO NODE     90.10 IS CODE =   1
----------------------------------------------------------------------------
           >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
                        TOTAL NUMBER OF STREAMS =  2
          CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
                  TIME OF CONCENTRATION(MIN.) =    6.60
                   RAINFALL INTENSITY(INCH/HR) =   4.84
                    TOTAL STREAM AREA(ACRES) =     0.34
               PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.40

****************************************************************************
      FLOW PROCESS FROM NODE    100.00 TO NODE    110.00 IS CODE =  22
----------------------------------------------------------------------------
           >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
                         *USER SPECIFIED(SUBAREA):
                  USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                     S.C.S. CURVE NUMBER (AMC II) =   0
                     USER SPECIFIED Tc(MIN.) =    5.000
            100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.796
                       SUBAREA RUNOFF(CFS) =      0.37
      TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.37

****************************************************************************
      FLOW PROCESS FROM NODE    110.00 TO NODE     90.10 IS CODE =  51
----------------------------------------------------------------------------
           >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
         >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    303.90  DOWNSTREAM(FEET) =    293.66
   CHANNEL LENGTH THRU SUBAREA(FEET) =   252.00   CHANNEL SLOPE =  0.0406
            CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   5.000
         MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
             100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.853
                         *USER SPECIFIED(SUBAREA):
                  USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                     S.C.S. CURVE NUMBER (AMC II) =   0
       TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.37
      TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.65
      AVERAGE FLOW DEPTH(FEET) =   0.05   TRAVEL TIME(MIN.) =   1.59
                           Tc(MIN.) =    6.59
    SUBAREA AREA(ACRES) =     0.49       SUBAREA RUNOFF(CFS) =    2.00
                AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
  TOTAL AREA(ACRES) =        0.6         PEAK FLOW RATE(CFS) =       2.31

                END OF SUBAREA CHANNEL FLOW HYDRAULICS:
          DEPTH(FEET) =  0.07   FLOW VELOCITY(FEET/SEC.) =   3.40
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE     90.10 =     418.00 FEET.

****************************************************************************
      FLOW PROCESS FROM NODE     90.10 TO NODE     90.10 IS CODE =   1
----------------------------------------------------------------------------
           >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
          >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
                        TOTAL NUMBER OF STREAMS =  2
```

CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 6.59
RAINFALL INTENSITY(INCH/HR) = 4.85
TOTAL STREAM AREA(ACRES) = 0.56
PEAK FLOW RATE(CFS) AT CONFLUENCE = 2.31

** CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	1.40	6.60	4.845	0.34
2	2.31	6.59	4.853	0.56

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	3.70	6.59	4.853
2	3.70	6.60	4.845

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 3.70 Tc(MIN.) = 6.59
TOTAL AREA(ACRES) = 0.9
LONGEST FLOWPATH FROM NODE 70.00 TO NODE 90.10 = 614.00 FEET.

****
FLOW PROCESS FROM NODE 90.10 TO NODE 60.00 IS CODE = 91

>>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
==
UPSTREAM NODE ELEVATION(FEET) = 293.66
DOWNSTREAM NODE ELEVATION(FEET) = 293.00
CHANNEL LENGTH THRU SUBAREA(FEET) = 10.00
"V" GUTTER WIDTH(FEET) = 1.50 GUTTER HIKE(FEET) = 0.250
PAVEMENT LIP(FEET) = 0.100 MANNING'S N = .0150
PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
MAXIMUM DEPTH(FEET) = 2.00
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 4.844
*USER SPECIFIED(SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = .8500
S.C.S. CURVE NUMBER (AMC II) = 0
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 3.72
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 8.28
AVERAGE FLOW DEPTH(FEET) = 0.38 FLOOD WIDTH(FEET) = 4.96
"V" GUTTER FLOW TRAVEL TIME(MIN.) = 0.02 Tc(MIN.) = 6.61
SUBAREA AREA(ACRES) = 0.01 SUBAREA RUNOFF(CFS) = 0.04
AREA-AVERAGE RUNOFF COEFFICIENT = 0.850
TOTAL AREA(ACRES) = 0.9 PEAK FLOW RATE(CFS) = 3.73

END OF SUBAREA "V" GUTTER HYDRAULICS:
DEPTH(FEET) = 0.39 FLOOD WIDTH(FEET) = 5.13
FLOW VELOCITY(FEET/SEC.) = 8.14 DEPTH*VELOCITY(FT*FT/SEC) = 3.14
LONGEST FLOWPATH FROM NODE 70.00 TO NODE 60.00 = 624.00 FEET.

****
FLOW PROCESS FROM NODE 60.00 TO NODE 60.00 IS CODE = 10

>>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
==

```
****************************************************************************
      FLOW PROCESS FROM NODE    120.00 TO NODE    130.00 IS CODE =  22
----------------------------------------------------------------------------
            >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
                        *USER SPECIFIED(SUBAREA):
                 USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                    S.C.S. CURVE NUMBER (AMC II) =   0
                    USER SPECIFIED Tc(MIN.) =    5.000
              100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.796
                     SUBAREA RUNOFF(CFS) =      0.49
       TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.49

****************************************************************************
      FLOW PROCESS FROM NODE    130.00 TO NODE     60.00 IS CODE =  51
----------------------------------------------------------------------------
               >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
            >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    297.42  DOWNSTREAM(FEET) =    293.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   150.00   CHANNEL SLOPE =  0.0295
          CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   5.000
        MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
            100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.018
                        *USER SPECIFIED(SUBAREA):
                 USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                    S.C.S. CURVE NUMBER (AMC II) =   0
       TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.83
      TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.99
      AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   1.25
                           Tc(MIN.) =    6.25
    SUBAREA AREA(ACRES) =     0.16       SUBAREA RUNOFF(CFS) =    0.68
                AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
  TOTAL AREA(ACRES) =        0.3         PEAK FLOW RATE(CFS) =       1.11

                END OF SUBAREA CHANNEL FLOW HYDRAULICS:
          DEPTH(FEET) =  0.05   FLOW VELOCITY(FEET/SEC.) =   2.23
 LONGEST FLOWPATH FROM NODE    120.00 TO NODE     60.00 =     160.00 FEET.

****************************************************************************
      FLOW PROCESS FROM NODE     60.00 TO NODE     60.00 IS CODE =  11
----------------------------------------------------------------------------
      >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

                    ** MAIN STREAM CONFLUENCE DATA **
             STREAM     RUNOFF      Tc      INTENSITY     AREA
             NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
               1        1.11     6.25       5.018        0.26
 LONGEST FLOWPATH FROM NODE    120.00 TO NODE     60.00 =     160.00 FEET.

                  ** MEMORY BANK #  1 CONFLUENCE DATA **
             STREAM     RUNOFF      Tc      INTENSITY     AREA
             NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
               1        3.33     9.12       3.934        0.91
 LONGEST FLOWPATH FROM NODE     40.00 TO NODE     60.00 =     687.00 FEET.

                        ** PEAK FLOW RATE TABLE **
                STREAM    RUNOFF       Tc      INTENSITY
```

NUMBER	(CFS)	(MIN.)	(INCH/HOUR)
1	3.39	6.25	5.018
2	4.20	9.12	3.934

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 4.20 Tc(MIN.) = 9.12
TOTAL AREA(ACRES) = 1.2

****
FLOW PROCESS FROM NODE 60.00 TO NODE 60.00 IS CODE = 12

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

****
FLOW PROCESS FROM NODE 60.00 TO NODE 60.00 IS CODE = 11

>>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
==========

** MAIN STREAM CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	4.20	9.12	3.934	1.17

LONGEST FLOWPATH FROM NODE 40.00 TO NODE 60.00 = 687.00 FEET.

** MEMORY BANK # 2 CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	3.73	6.61	4.844	0.90

LONGEST FLOWPATH FROM NODE 70.00 TO NODE 60.00 = 624.00 FEET.

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	6.77	6.61	4.844
2	7.22	9.12	3.934

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 7.22 Tc(MIN.) = 9.12
TOTAL AREA(ACRES) = 2.1

****
FLOW PROCESS FROM NODE 60.00 TO NODE 60.00 IS CODE = 12

>>>>>CLEAR MEMORY BANK # 2 <<<<<
==========

****
FLOW PROCESS FROM NODE 60.00 TO NODE 140.00 IS CODE = 62

>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STREET TABLE SECTION # 1 USED)<<<<<
==========
UPSTREAM ELEVATION(FEET) = 293.00 DOWNSTREAM ELEVATION(FEET) = 291.87
STREET LENGTH(FEET) = 158.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 10.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 5.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020

```
                OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

          SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
              STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
    Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

       **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.24
                         ***STREET FLOWING FULL***
                STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                       STREET FLOW DEPTH(FEET) =  0.36
                    HALFSTREET FLOOD WIDTH(FEET) =   10.00
                  AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.55
                PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.91
         STREET FLOW TRAVEL TIME(MIN.) =   1.03   Tc(MIN.) =   10.15
               100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.671
                         *USER SPECIFIED(SUBAREA):
                   USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                      S.C.S. CURVE NUMBER (AMC II) =   0
                   AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
      SUBAREA AREA(ACRES) =    0.01      SUBAREA RUNOFF(CFS) =    0.03
    TOTAL AREA(ACRES) =        2.1       PEAK FLOW RATE(CFS) =       7.22

                    END OF SUBAREA STREET FLOW HYDRAULICS:
         DEPTH(FEET) = 0.36   HALFSTREET FLOOD WIDTH(FEET) =  10.00
    FLOW VELOCITY(FEET/SEC.) =  2.55   DEPTH*VELOCITY(FT*FT/SEC.) =   0.91
  LONGEST FLOWPATH FROM NODE     40.00 TO NODE    140.00 =     845.00 FEET.

****************************************************************************
      FLOW PROCESS FROM NODE    140.00 TO NODE    140.00 IS CODE =   1
----------------------------------------------------------------------------
            >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
                         TOTAL NUMBER OF STREAMS =  2
            CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
                    TIME OF CONCENTRATION(MIN.) =   10.15
                     RAINFALL INTENSITY(INCH/HR) =   3.67
                      TOTAL STREAM AREA(ACRES) =     2.09
                  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.22

****************************************************************************
      FLOW PROCESS FROM NODE    150.00 TO NODE    160.00 IS CODE =  22
----------------------------------------------------------------------------
              >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
                         *USER SPECIFIED(SUBAREA):
                   USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                      S.C.S. CURVE NUMBER (AMC II) =   0
                      USER SPECIFIED Tc(MIN.) =    5.000
                100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.796
                         SUBAREA RUNOFF(CFS) =      0.49
        TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.49

****************************************************************************
      FLOW PROCESS FROM NODE    160.00 TO NODE    140.00 IS CODE =  51
----------------------------------------------------------------------------
                >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
            >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    294.85  DOWNSTREAM(FEET) =    291.87
```

CHANNEL LENGTH THRU SUBAREA(FEET) = 115.00 CHANNEL SLOPE = 0.0259
CHANNEL BASE(FEET) = 10.00 "Z" FACTOR = 5.000
MANNING'S FACTOR = 0.015 MAXIMUM DEPTH(FEET) = 2.00
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 5.161
*USER SPECIFIED(SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = .8500
S.C.S. CURVE NUMBER (AMC II) = 0
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 0.81
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) = 1.94
AVERAGE FLOW DEPTH(FEET) = 0.04 TRAVEL TIME(MIN.) = 0.99
Tc(MIN.) = 5.99
SUBAREA AREA(ACRES) = 0.15 SUBAREA RUNOFF(CFS) = 0.64
AREA-AVERAGE RUNOFF COEFFICIENT = 0.850
TOTAL AREA(ACRES) = 0.2 PEAK FLOW RATE(CFS) = 1.08

END OF SUBAREA CHANNEL FLOW HYDRAULICS:
DEPTH(FEET) = 0.05 FLOW VELOCITY(FEET/SEC.) = 2.08
LONGEST FLOWPATH FROM NODE 150.00 TO NODE 140.00 = 15915.00 FEET.

****
FLOW PROCESS FROM NODE 140.00 TO NODE 140.00 IS CODE = 1

>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==
TOTAL NUMBER OF STREAMS = 2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM 2 ARE:
TIME OF CONCENTRATION(MIN.) = 5.99
RAINFALL INTENSITY(INCH/HR) = 5.16
TOTAL STREAM AREA(ACRES) = 0.25
PEAK FLOW RATE(CFS) AT CONFLUENCE = 1.08

** CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	7.22	10.15	3.671	2.09
2	1.08	5.99	5.161	0.25

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	5.34	5.99	5.161
2	7.99	10.15	3.671

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 7.99 Tc(MIN.) = 10.15
TOTAL AREA(ACRES) = 2.3
LONGEST FLOWPATH FROM NODE 150.00 TO NODE 140.00 = 15915.00 FEET.

****
FLOW PROCESS FROM NODE 140.00 TO NODE 140.00 IS CODE = 81

>>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.671
*USER SPECIFIED(SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = .8500

```
                S.C.S. CURVE NUMBER (AMC II) =   0
             AREA-AVERAGE RUNOFF COEFFICIENT = 0.8500
    SUBAREA AREA(ACRES) =    0.19   SUBAREA RUNOFF(CFS) =    0.60
   TOTAL AREA(ACRES) =        2.5   TOTAL RUNOFF(CFS) =       7.99
                      TC(MIN.) =   10.15
        NOTE: PEAK FLOW RATE DEFAULTED TO UPSTREAM VALUE

****************************************************************************
  FLOW PROCESS FROM NODE    140.00 TO NODE    500.00 IS CODE =  62
----------------------------------------------------------------------------
       >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
            >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) =  291.87  DOWNSTREAM ELEVATION(FEET) =  291.00
    STREET LENGTH(FEET) =    56.00   CURB HEIGHT(INCHES) =  6.0
                  STREET HALFWIDTH(FEET) = 10.00

     DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =   5.00
             INSIDE STREET CROSSFALL(DECIMAL) =  0.020
            OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.020

       SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF =  1
           STREET PARKWAY CROSSFALL(DECIMAL)  =  0.020
 Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) =   0.0130
    Manning's FRICTION FACTOR for Back-of-Walk Flow Section =   0.0200

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.01
                    ***STREET FLOWING FULL***
          STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
                 STREET FLOW DEPTH(FEET) =  0.33
              HALFSTREET FLOOD WIDTH(FEET) =   10.00
            AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.38
          PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.12
     STREET FLOW TRAVEL TIME(MIN.) =   0.28   Tc(MIN.) =   10.43
          100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.608
                    *USER SPECIFIED(SUBAREA):
              USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                 S.C.S. CURVE NUMBER (AMC II) =   0
              AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
   SUBAREA AREA(ACRES) =    0.01      SUBAREA RUNOFF(CFS) =    0.03
 TOTAL AREA(ACRES) =        2.5       PEAK FLOW RATE(CFS) =       7.99

            END OF SUBAREA STREET FLOW HYDRAULICS:
     DEPTH(FEET) = 0.33   HALFSTREET FLOOD WIDTH(FEET) =  10.00
 FLOW VELOCITY(FEET/SEC.) =  3.37   DEPTH*VELOCITY(FT*FT/SEC.) =   1.12
LONGEST FLOWPATH FROM NODE    150.00 TO NODE    500.00 =   15971.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    500.00 TO NODE    500.00 IS CODE =  10
----------------------------------------------------------------------------
       >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    170.00 TO NODE    180.00 IS CODE =  22
----------------------------------------------------------------------------
       >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
                    *USER SPECIFIED(SUBAREA):
              USER-SPECIFIED RUNOFF COEFFICIENT = .8500
```

```
                S.C.S. CURVE NUMBER (AMC II) =   0
                USER SPECIFIED Tc(MIN.) =    5.000
          100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.796
                SUBAREA RUNOFF(CFS) =      0.49
     TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.49

****************************************************************************
      FLOW PROCESS FROM NODE    180.00 TO NODE    500.00 IS CODE =  51
----------------------------------------------------------------------------
            >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
         >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    303.90  DOWNSTREAM(FEET) =    291.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   345.00   CHANNEL SLOPE =  0.0374
          CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   5.000
        MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
          100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.708
                    *USER SPECIFIED(SUBAREA):
               USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                  S.C.S. CURVE NUMBER (AMC II) =   0
       TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.81
      TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.02
      AVERAGE FLOW DEPTH(FEET) =   0.06   TRAVEL TIME(MIN.) =   1.90
                        Tc(MIN.) =    6.90
    SUBAREA AREA(ACRES) =     0.65       SUBAREA RUNOFF(CFS) =    2.62
              AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
  TOTAL AREA(ACRES) =        0.8         PEAK FLOW RATE(CFS) =       3.02

               END OF SUBAREA CHANNEL FLOW HYDRAULICS:
         DEPTH(FEET) =  0.08   FLOW VELOCITY(FEET/SEC.) =   3.58
 LONGEST FLOWPATH FROM NODE    170.00 TO NODE    500.00 =     401.00 FEET.

****************************************************************************
      FLOW PROCESS FROM NODE    500.00 TO NODE    500.00 IS CODE =  10
----------------------------------------------------------------------------
         >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
      FLOW PROCESS FROM NODE    190.00 TO NODE    200.00 IS CODE =  22
----------------------------------------------------------------------------
            >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
                    *USER SPECIFIED(SUBAREA):
               USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                  S.C.S. CURVE NUMBER (AMC II) =   0
                  USER SPECIFIED Tc(MIN.) =    5.000
            100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.796
                  SUBAREA RUNOFF(CFS) =      0.72
       TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.72

****************************************************************************
      FLOW PROCESS FROM NODE    200.00 TO NODE    210.00 IS CODE =  51
----------------------------------------------------------------------------
            >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
         >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    316.00  DOWNSTREAM(FEET) =    304.00
   CHANNEL LENGTH THRU SUBAREA(FEET) =   397.00   CHANNEL SLOPE =  0.0302
          CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   5.000
```

```
MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
    100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.851
              *USER SPECIFIED(SUBAREA):
          USER-SPECIFIED RUNOFF COEFFICIENT = .8500
             S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.26
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.16
 AVERAGE FLOW DEPTH(FEET) =   0.12   TRAVEL TIME(MIN.) =   1.59
                    Tc(MIN.) =    6.59
 SUBAREA AREA(ACRES) =     2.19       SUBAREA RUNOFF(CFS) =    9.02
          AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
TOTAL AREA(ACRES) =        2.3         PEAK FLOW RATE(CFS) =       9.62

          END OF SUBAREA CHANNEL FLOW HYDRAULICS:
    DEPTH(FEET) =  0.17   FLOW VELOCITY(FEET/SEC.) =   5.13
LONGEST FLOWPATH FROM NODE    190.00 TO NODE    210.00 =     742.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    210.00 TO NODE    220.00 IS CODE =  91
----------------------------------------------------------------------------
    >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
          UPSTREAM NODE ELEVATION(FEET) =    304.00
        DOWNSTREAM NODE ELEVATION(FEET) =    300.40
       CHANNEL LENGTH THRU SUBAREA(FEET) =   271.00
  "V" GUTTER WIDTH(FEET) =   1.50   GUTTER HIKE(FEET) =  0.250
       PAVEMENT LIP(FEET) =  0.100   MANNING'S N = .0150
        PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
                 MAXIMUM DEPTH(FEET) =   2.00
       100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.299
              *USER SPECIFIED(SUBAREA):
          USER-SPECIFIED RUNOFF COEFFICIENT = .8500
             S.C.S. CURVE NUMBER (AMC II) =   0
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      9.64
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.32
 AVERAGE FLOW DEPTH(FEET) =   0.56   FLOOD WIDTH(FEET) =   22.69
 "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.36   Tc(MIN.) =    7.95
 SUBAREA AREA(ACRES) =    0.01       SUBAREA RUNOFF(CFS) =    0.04
          AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
TOTAL AREA(ACRES) =        2.3         PEAK FLOW RATE(CFS) =       9.62

          END OF SUBAREA "V" GUTTER HYDRAULICS:
    DEPTH(FEET) =  0.56   FLOOD WIDTH(FEET) =   22.69
FLOW VELOCITY(FEET/SEC.) =   3.32   DEPTH*VELOCITY(FT*FT/SEC) =   1.86
LONGEST FLOWPATH FROM NODE    190.00 TO NODE    220.00 =    1013.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    220.00 TO NODE    220.00 IS CODE =   1
----------------------------------------------------------------------------
    >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
          TOTAL NUMBER OF STREAMS =  2
    CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
          TIME OF CONCENTRATION(MIN.) =    7.95
           RAINFALL INTENSITY(INCH/HR) =   4.30
            TOTAL STREAM AREA(ACRES) =     2.34
       PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.62

****************************************************************************
 FLOW PROCESS FROM NODE    230.00 TO NODE    240.00 IS CODE =  22
```

```
--------------------------------------------------------------------------
          >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
                        *USER SPECIFIED(SUBAREA):
                 USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                    S.C.S. CURVE NUMBER (AMC II) =   0
                    USER SPECIFIED Tc(MIN.) =    5.000
             100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.796
                      SUBAREA RUNOFF(CFS) =      0.49
       TOTAL AREA(ACRES) =      0.10   TOTAL RUNOFF(CFS) =      0.49

**************************************************************************
     FLOW PROCESS FROM NODE    240.00 TO NODE    220.00 IS CODE =  51
--------------------------------------------------------------------------
          >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
        >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =    303.90  DOWNSTREAM(FEET) =    300.40
   CHANNEL LENGTH THRU SUBAREA(FEET) =   210.00   CHANNEL SLOPE =  0.0167
            CHANNEL BASE(FEET) =   10.00   "Z" FACTOR =   5.000
         MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   2.00
             100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.790
                        *USER SPECIFIED(SUBAREA):
                 USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                    S.C.S. CURVE NUMBER (AMC II) =   0
       TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.22
      TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.04
      AVERAGE FLOW DEPTH(FEET) =   0.06   TRAVEL TIME(MIN.) =   1.72
                           Tc(MIN.) =    6.72
    SUBAREA AREA(ACRES) =     0.36       SUBAREA RUNOFF(CFS) =    1.45
                AREA-AVERAGE RUNOFF COEFFICIENT =  0.850
   TOTAL AREA(ACRES) =        0.5         PEAK FLOW RATE(CFS) =       1.86

                END OF SUBAREA CHANNEL FLOW HYDRAULICS:
          DEPTH(FEET) =  0.08   FLOW VELOCITY(FEET/SEC.) =   2.26
  LONGEST FLOWPATH FROM NODE    230.00 TO NODE    220.00 =     481.00 FEET.

**************************************************************************
     FLOW PROCESS FROM NODE    220.00 TO NODE    220.00 IS CODE =  81
--------------------------------------------------------------------------
          >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
             100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.790
                        *USER SPECIFIED(SUBAREA):
                 USER-SPECIFIED RUNOFF COEFFICIENT = .8500
                    S.C.S. CURVE NUMBER (AMC II) =   0
                AREA-AVERAGE RUNOFF COEFFICIENT = 0.8500
       SUBAREA AREA(ACRES) =    0.49   SUBAREA RUNOFF(CFS) =    2.00
      TOTAL AREA(ACRES) =        0.9   TOTAL RUNOFF(CFS) =       3.86
                          TC(MIN.) =    6.72

**************************************************************************
     FLOW PROCESS FROM NODE    220.00 TO NODE    220.00 IS CODE =   1
--------------------------------------------------------------------------
          >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
        >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==========================================================================
                       TOTAL NUMBER OF STREAMS =  2
          CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
                  TIME OF CONCENTRATION(MIN.) =    6.72
```

RAINFALL INTENSITY(INCH/HR) = 4.79
TOTAL STREAM AREA(ACRES) = 0.95
PEAK FLOW RATE(CFS) AT CONFLUENCE = 3.86

** CONFLUENCE DATA **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)	AREA (ACRE)
1	9.62	7.95	4.299	2.34
2	3.86	6.72	4.790	0.95

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

** PEAK FLOW RATE TABLE **

STREAM NUMBER	RUNOFF (CFS)	Tc (MIN.)	INTENSITY (INCH/HOUR)
1	12.00	6.72	4.790
2	13.09	7.95	4.299

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) = 13.09 Tc(MIN.) = 7.95
TOTAL AREA(ACRES) = 3.3
LONGEST FLOWPATH FROM NODE 190.00 TO NODE 220.00 = 1013.00 FEET.

****
FLOW PROCESS FROM NODE 220.00 TO NODE 500.00 IS CODE = 62

>>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>(STREET TABLE SECTION # 1 USED)<<<<<
==
UPSTREAM ELEVATION(FEET) = 300.40 DOWNSTREAM ELEVATION(FEET) = 291.00
STREET LENGTH(FEET) = 290.00 CURB HEIGHT(INCHES) = 6.0
STREET HALFWIDTH(FEET) = 10.00

DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) = 5.00
INSIDE STREET CROSSFALL(DECIMAL) = 0.020
OUTSIDE STREET CROSSFALL(DECIMAL) = 0.020

SPECIFIED NUMBER OF HALFSTREETS CARRYING RUNOFF = 1
STREET PARKWAY CROSSFALL(DECIMAL) = 0.020
Manning's FRICTION FACTOR for Streetflow Section(curb-to-curb) = 0.0130
Manning's FRICTION FACTOR for Back-of-Walk Flow Section = 0.0200

**TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) = 13.11
STREET FLOWING FULL
STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
STREET FLOW DEPTH(FEET) = 0.34
HALFSTREET FLOOD WIDTH(FEET) = 10.00
AVERAGE FLOW VELOCITY(FEET/SEC.) = 5.11
PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) = 1.75
STREET FLOW TRAVEL TIME(MIN.) = 0.95 Tc(MIN.) = 8.89
100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 3.998
*USER SPECIFIED(SUBAREA):
USER-SPECIFIED RUNOFF COEFFICIENT = .8500
S.C.S. CURVE NUMBER (AMC II) = 0
AREA-AVERAGE RUNOFF COEFFICIENT = 0.850
SUBAREA AREA(ACRES) = 0.01 SUBAREA RUNOFF(CFS) = 0.03
TOTAL AREA(ACRES) = 3.3 PEAK FLOW RATE(CFS) = 13.09

END OF SUBAREA STREET FLOW HYDRAULICS:

```
        DEPTH(FEET) = 0.34   HALFSTREET FLOOD WIDTH(FEET) =  10.00
  FLOW VELOCITY(FEET/SEC.) =  5.10   DEPTH*VELOCITY(FT*FT/SEC.) =   1.75
 LONGEST FLOWPATH FROM NODE    190.00 TO NODE    500.00 =    1303.00 FEET.

****************************************************************************
      FLOW PROCESS FROM NODE    500.00 TO NODE    500.00 IS CODE =  11
----------------------------------------------------------------------------
      >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

                    ** MAIN STREAM CONFLUENCE DATA **
             STREAM     RUNOFF      Tc      INTENSITY     AREA
             NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
               1       13.09     8.89       3.998        3.30
 LONGEST FLOWPATH FROM NODE    190.00 TO NODE    500.00 =    1303.00 FEET.

                  ** MEMORY BANK #  1 CONFLUENCE DATA **
             STREAM     RUNOFF      Tc      INTENSITY     AREA
             NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
               1        7.99    10.43       3.608        2.54
 LONGEST FLOWPATH FROM NODE    150.00 TO NODE    500.00 =   15971.00 FEET.

                       ** PEAK FLOW RATE TABLE **
                  STREAM    RUNOFF       Tc      INTENSITY
                  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
                    1      19.91       8.89        3.998
                    2      19.81      10.43        3.608

              COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
          PEAK FLOW RATE(CFS) =      19.91   Tc(MIN.) =    8.89
                    TOTAL AREA(ACRES) =        5.8

****************************************************************************
      FLOW PROCESS FROM NODE    500.00 TO NODE    500.00 IS CODE =  12
----------------------------------------------------------------------------
                      >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
      FLOW PROCESS FROM NODE    500.00 TO NODE    500.00 IS CODE =  11
----------------------------------------------------------------------------
      >>>>>CONFLUENCE MEMORY BANK # 2 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

                    ** MAIN STREAM CONFLUENCE DATA **
             STREAM     RUNOFF      Tc      INTENSITY     AREA
             NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
               1       19.91     8.89       3.998        5.84
 LONGEST FLOWPATH FROM NODE    150.00 TO NODE    500.00 =   15971.00 FEET.

                  ** MEMORY BANK #  2 CONFLUENCE DATA **
             STREAM     RUNOFF      Tc      INTENSITY     AREA
             NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
               1        3.02     6.90       4.708        0.75
 LONGEST FLOWPATH FROM NODE    170.00 TO NODE    500.00 =     401.00 FEET.

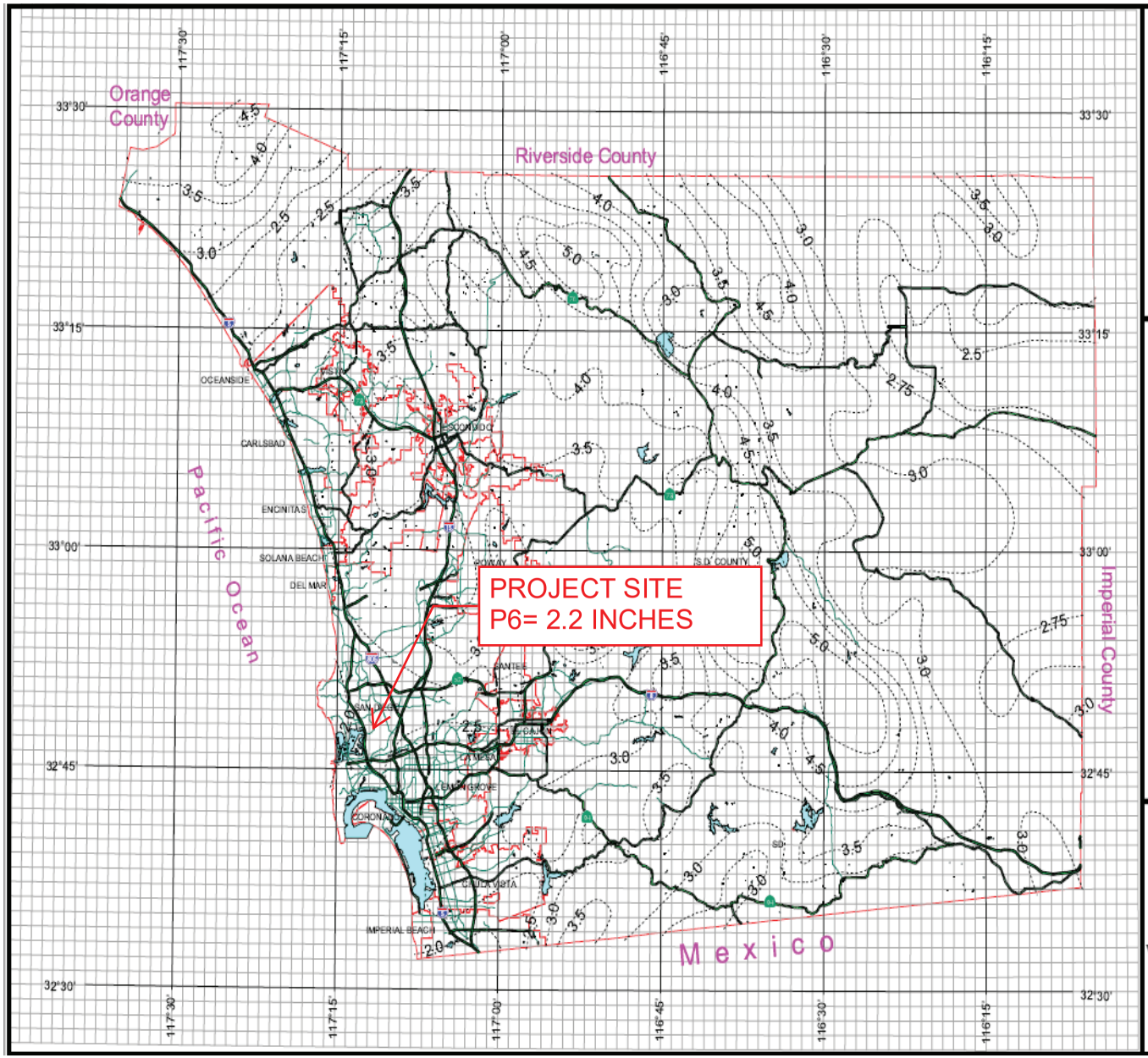
                       ** PEAK FLOW RATE TABLE **
                  STREAM    RUNOFF       Tc      INTENSITY
                  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
                    1      18.47       6.90        4.708
```

```
    2      22.47       8.89        3.998

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =      22.47   Tc(MIN.) =    8.89
            TOTAL AREA(ACRES) =        6.6

****************************************************************************
      FLOW PROCESS FROM NODE    500.00 TO NODE    500.00 IS CODE =  12
----------------------------------------------------------------------------
                     >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================
============================================================================
                          END OF STUDY SUMMARY:
         TOTAL AREA(ACRES)     =         6.6  TC(MIN.) =      8.89
                    PEAK FLOW RATE(CFS)    =      22.47
============================================================================
============================================================================
                      END OF RATIONAL METHOD ANALYSIS
```

APPENDIX 2
PRE-DEVELOPMENT HYDROLOGY MAP



County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 6 Hours

Isopluvial (inches)

DPW GIS
Department of Public Works Geographic Information Services

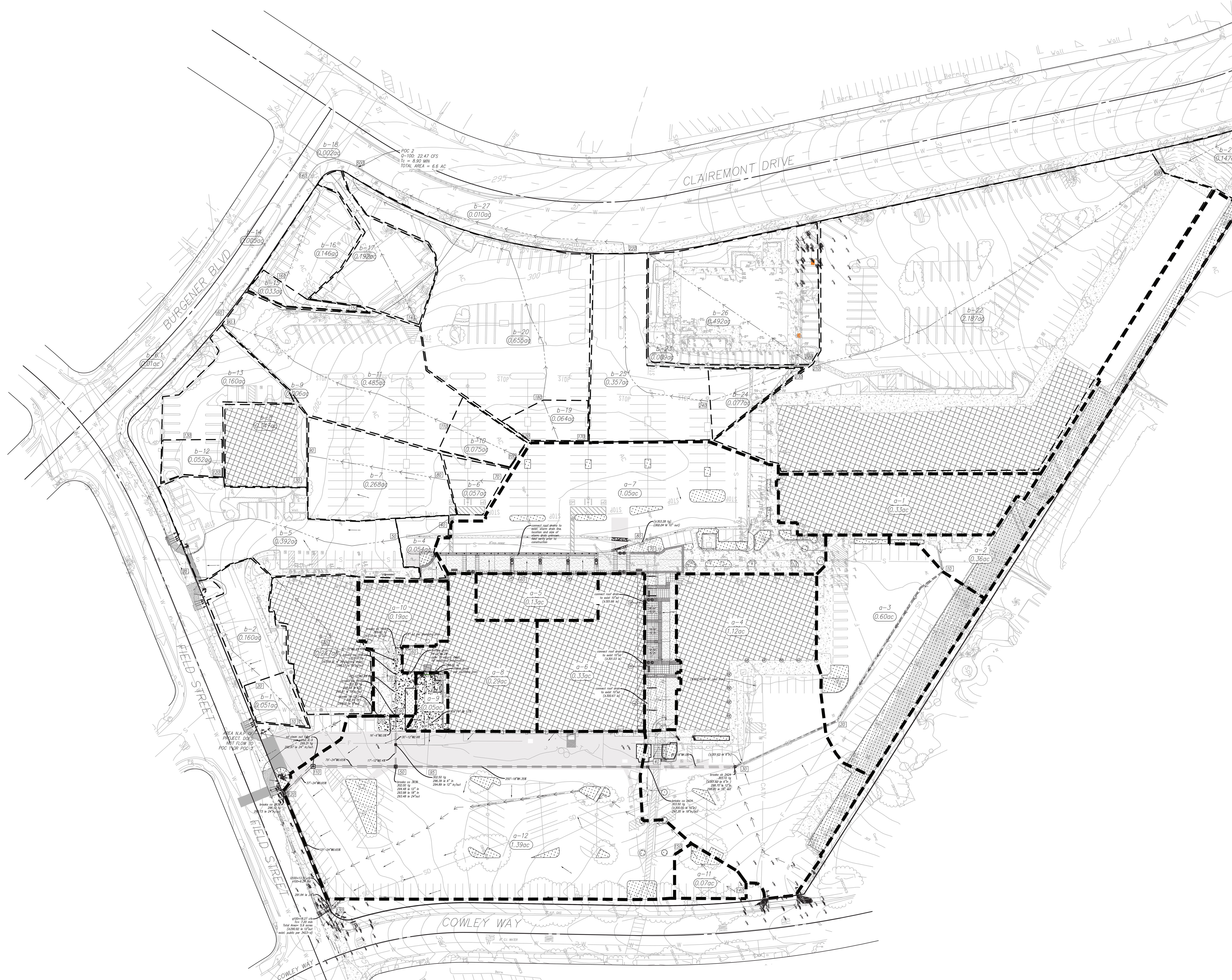
SanGIS
We Have San Diego Covered!

N W E S

3 0 3 Miles

PRE-DEVELOPMENT HYDROLOGY MAP FOR:

3007 CLAIREMONT VILLAGE



LEGEND

EXISTING IMPROVEMENTS

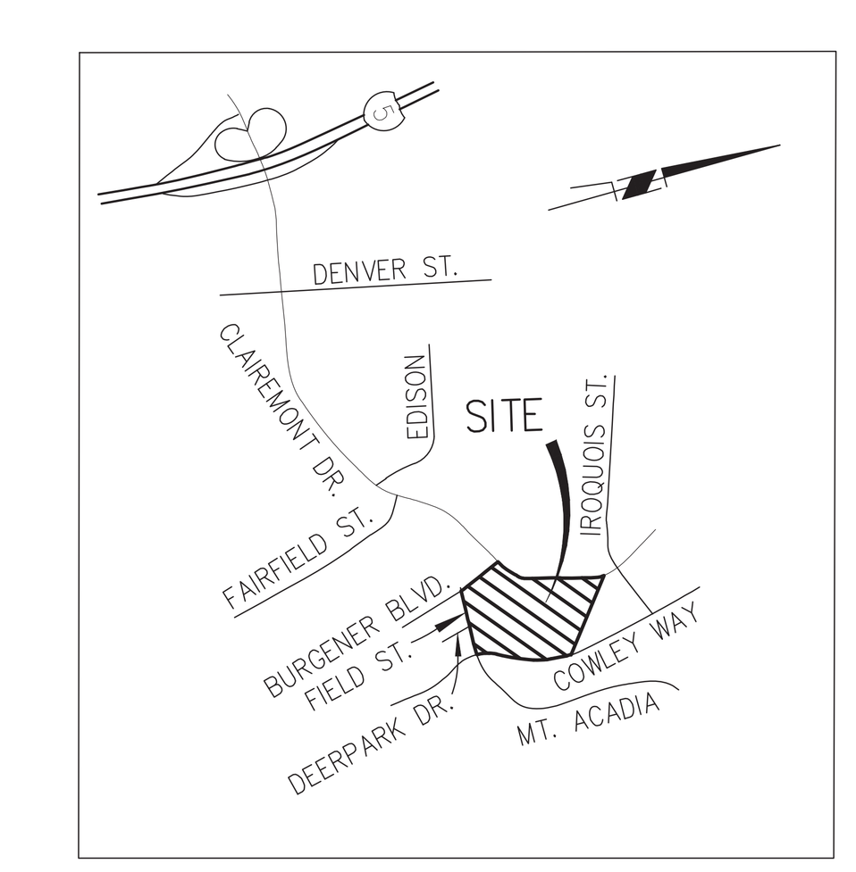
- EXIST. ELECTRICAL LINE
- EXIST. GAS LINE
- EXIST. DOMESTIC WATER LINE
- EXIST. SANITARY SEWER LINE
- EXIST. STORM DRAIN LINE
- EXIST. TELEPHONE LINE
- EXIST. STREET LIGHT LINE
- EXIST. conc. pvmt.
- EXIST. FIRE HYDRANT
- EXIST. POWER POLE
- EXIST. STREET LIGHT
- exist. contour
- property line
- exist. wall
- exist. tree
- EXIST. ROOf
- exist. ROOf drain
- EXIST. pervious

PROPOSED IMPROVEMENTS

- 6"pcc curb (pvt.)
- 6"pcc curb & GUTTER
- pcc pavement
- ac pavement
- storm drain cleanout
- storm drain catch basin
- storm drain < 12" diameter
- STORM DRAIN ≥ 12" DIAMETER
- prop. ROOf
- prop. ROOf drain
- prop. pervious

DRAINAGE

- hydrolength
- drainage basin
- drainage basin designator — a-12
- drainage basin area — 1.39ac
- node designator — 60



VICINITY MAP
NO SCALE

1239 CLAIREMONT VILLAGE SHOPPING CENTER
DRAINAGE CONDITIONS

Drainage Area #	Surface Type	Area sf	Area ac	Pervious [sf]	Pervious [ac]	Pervious Percentage [%]	Impervious [sf]	Impervious [ac]	Impervious Percentage [%]	Table 2 Commercial Imperviousness [%] per City of San Diego Drainage Design Manual	Table 2 Runoff Coeffficient for Commercial Development per City of San Diego Drainage Design Manual	Weighted Runoff Coefficient "C"	Adjusted Runoff Coefficient, C 0.5 < C < 0.85
A-1	Roof	14,453	0.33	0	0.00	0.00	14,453	0.33	100.00	80	0.85	1.06	0.85
A-2	AC Pvmt, conc pvmt, landscape	15,621	0.36	7,589	0.17	48.58	8,032	0.18	51.42	80	0.85	0.55	0.55
A-3	AC Pvmt, conc pvmt, landscape	26,039	0.60	6,176	0.14	23.72	19,863	0.46	76.28	80	0.85	0.81	0.81
A-4	Roof, AC pvmt, conc pvmt, landscape	48,671	1.12	1,790	0.04	3.68	46,881	1.08	96.32	80	0.85	1.02	0.85
A-5	Roof	5,787	0.13	0	0.00	0.00	5,787	0.13	100.00	80	0.85	1.06	0.85
A-6	Roof	14,312	0.33	1	0.00	0.01	14,311	0.33	99.99	80	0.85	1.06	0.85
A-7	AC Pvmt, conc pvmt, landscape	45,756	1.05	4,525	0.10	9.89	41,231	0.95	90.11	80	0.85	0.96	0.85
A-8	Roof	12,617	0.29	0	0.00	0.00	12,617	0.29	100.00	80	0.85	1.06	0.85
A-9	Loading Dock	1,992	0.05	0	0.00	0.00	1,992	0.05	100.00	80	0.85	1.06	0.85
A10	Roof, AC pvmt, conc pvmt	8,473	0.19	0	0.00	0.00	8,473	0.19	100.00	80	0.85	1.06	0.85
A-11	AC Pvmt, conc pvmt, landscape	2,959	0.07	0	0.00	0.00	2,959	0.07	100.00	80	0.85	1.06	0.85
A-12	AC Pvmt, conc pvmt, landscape	60,714	1.39	2,884	0.07	4.75	57,830	1.33	95.25	80	0.85	1.01	0.85
	Total	**257,394**	**5.91**	**22,965**	**0.53**	**8.92**	**234,430**	**5.38**	**91.08**	80	0.85	**0.97**	**0.85**

Runoff Coefficent C (Rational Method)*
(1) Type D to be used for all areas

(2) Where actual conditions deviate significantly from the tabulated imperviousness values of 80%, the values given for coefficient C, may be revised by multiplying 80% by the ratio of actual imperviousness to the tabulated imperviousness. however, in no case shall the final coefficient be less than 0.50.

Example:
Actual Imperviousness = 50%
Tabulated Imperviousness = 80%

Revised C = (50/80) x 0.85 = 0.53

* Per Table 2 *Runoff Coefficients (Rational Method)* of City of San Diego Drainge Design Manual, dated April 1984

REGISTERED PROFESSIONAL ENGINEER
MELLOR R. LANDY
No. 81085
Exp. 09-30-21
CIVIL
STATE OF CALIFORNIA

SCALE: 1" = 40'

0 40' 80' 120'
SCALE: 1"= 40'

NOVA ENGINEERING
4373 VIEWRIDGE AVENUE, SUITE A
SAN DIEGO, CA 92123
(619) 296-1010
JOB NO. XXXX

PRIVATE CONTRACT

3007 CLAIREMONT VILLAGE

FIELD STREET AND COWLEY WAY
PRE-DEVELOPMENT HYDROMAP

CITY OF SAN DIEGO, CALIFORNIA
DEVELOPMENT SERVICES DEPARTMENT
SHEET **1** OF **1** SHEETS

PROJECT NO. XXXXXX

FOR CITY ENGINEER ______ DATE ______

V.T.M. ______

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	NOVA			
AS-BUILTS				

XXXX-XXXX
NAD83 COORDINATES

XXX-XXXX
LAMBERT COORDINATES

CONTRACTOR ______ DATE STARTED ______
INSPECTOR ______ DATE COMPLETED ______

C-1

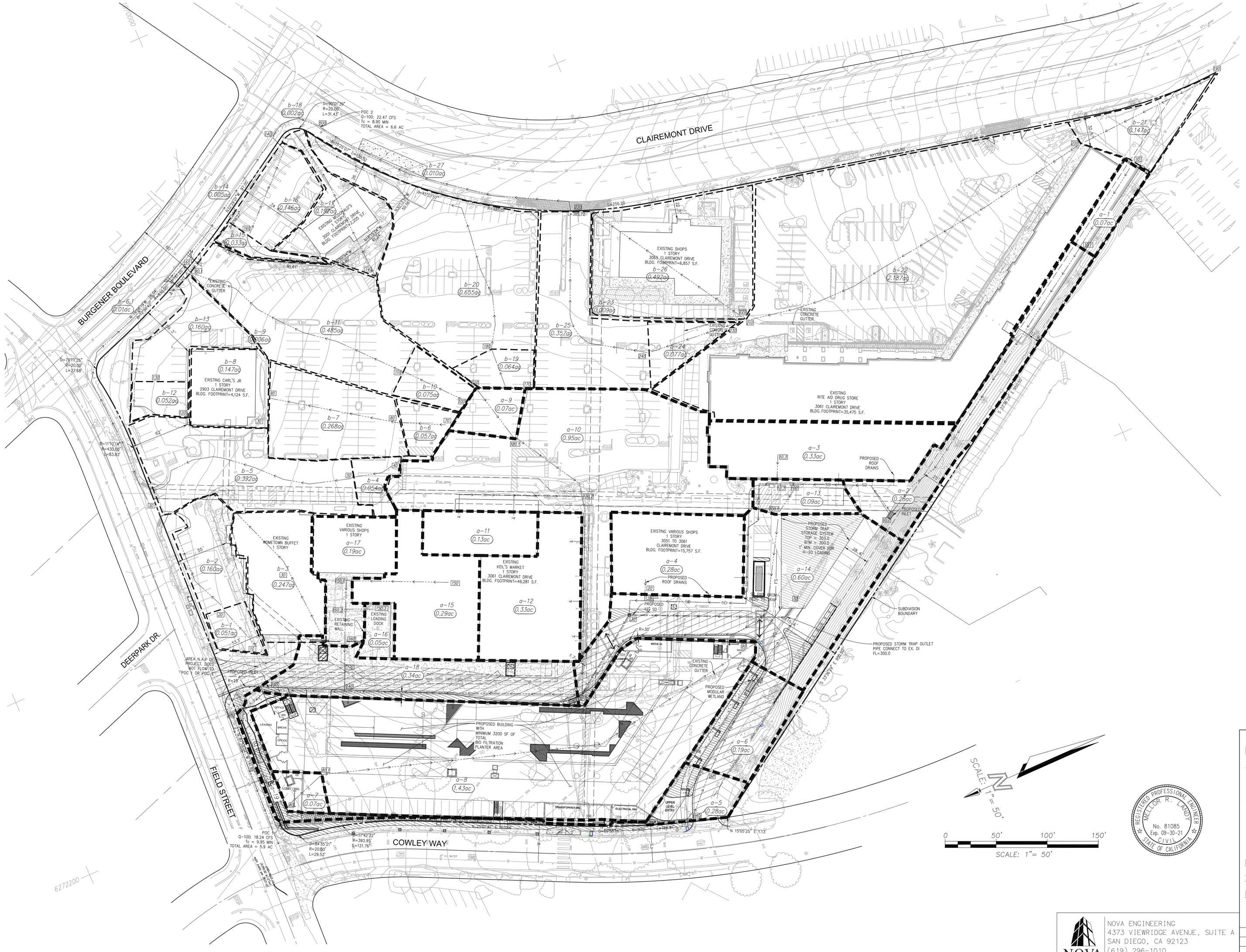
APPENDIX 2
POST-DEVELOPMENT HYDROLOGY MAP

POST-DEVELOPMENT HYDROLOGY MAP FOR:

3007 CLAIREMONT VILLAGE

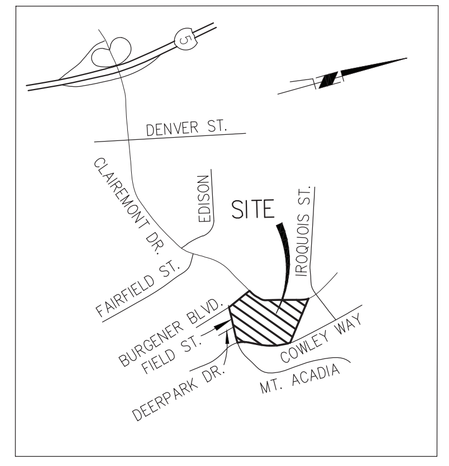
NEIGHBORHOOD DEVELOPMENT PERMIT

CLAIREMONT VILLAGE



LEGEND

ITEM	SYMBOL
EXISTING BUILDING	
EXISTING WALL	
EXISTING DOMESTIC WATER LINE	W
EXISTING FIRE SERVICE LINE	F
EXISTING SANITARY SEWER	S
EXISTING STORM DRAIN LINE	SD
EXISTING ELECTRICAL LINE	E
EXISTING GAS LINE	G
EXISTING TELECOMMUNICATION LINE	T
EXISTING FIBER OPTIC LINE	F/O
EXISTING CONCRETE PAVEMENT	
EXISTING FIRE HYDRANT	
EXISTING POWER POLE	
EXISTING STREET LIGHT	
EXISTING CONTOUR	312
EXISTING EASEMENT	
EXISTING TREE	
PROPERTY LINE	P/L
RIGHT-OF-WAY LINE	R/W
PROPOSED CONTOUR	312
PROPOSED FIRE SERVICE	FS
PROPOSED WATER LATERAL	W
PROPOSED SEWER LATERAL	S



VICINITY MAP
NO SCALE

ENGINEER OF WORK/ APPLICANT
NOVA ENGINEERING
4373 VIEWRIDGE AVENUE
SAN DIEGO, CA. 92123 PHONE: (619)-296-1010

MELLOR R. LANDY

REGISTERED PROFESSIONAL ENGINEER MELLOR R. LANDY No. 81085 Exp. 09-30-21 CIVIL STATE OF CALIFORNIA

ARCHITECT:
AO ARCHITECTS
144 NORTH ORANGE STREET
ORANGE, CA. 92866
PHONE: (714)-639-9860

OWNER:
CLAIREMONT VILLAGE QUAD, LLC
KLEEGE ENTERPRISES
12625 HIGH BLUFF DRIVE, SUITE 310
SAN DIEGO, CA 92130
PHONE: (858)-481-3081

BRUCE KLEEGE

PROJECT NAME: CLAIREMONT VILLAGE

SHEET TITLE: POST-DEVELOPMENT DRAINAGE CONDITIONS

DATE PREPARED: SEPTEMBER 9, 2021

NOVA ENGINEERING
4373 VIEWRIDGE AVENUE, SUITE A
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(619) 296-1010
JOB NO. XXXX

NO.	DATE	REVISION
1		
2		
3		