Preliminary

Hydrology and Hydraulics Report

The Magnet

SEC of State Street and Ramona Expressway

January 23, 2024

This Hydraulic Study has been prepared by, and under the direction of, the undersigned, a duly Registered Civil Engineer in the State of California. Except as noted, the undersigned attests to the technical information contained herein, and has judged to be acceptable the qualifications of any technical specialists providing engineering data for this report, upon which findings, conclusions, and recommendations are based.

_____

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Exp.: 03/31/2025

Prepared for:

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TAIT JOB # **SP8950**

Table of Contents

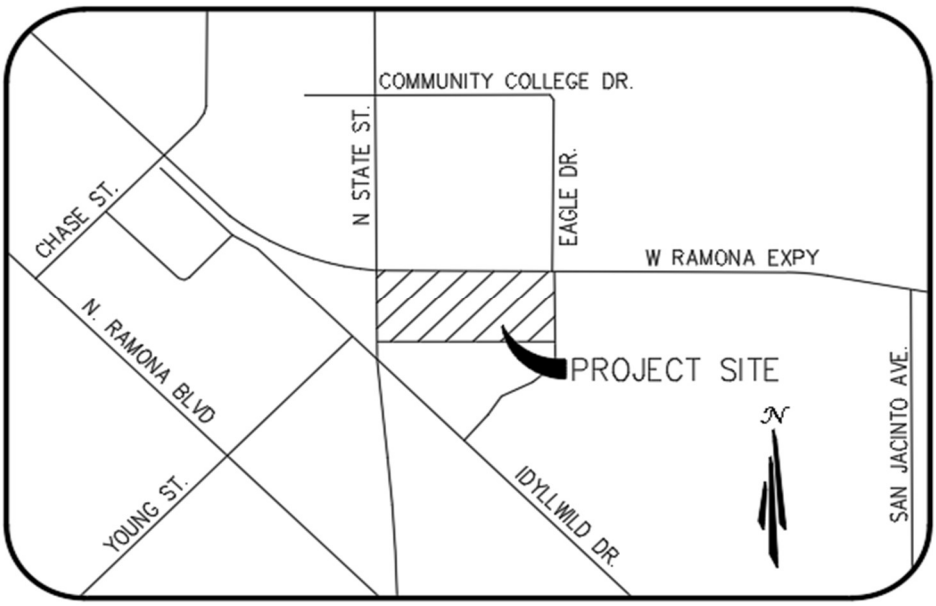
Section 1 Introduction and Background

The Rich Development Company has retained Tait & Associates (Tait) to prepare the drainage design for the Magnet development. The Magnet development is approximately 14.4 acres and it is located in the City of San Jacinto (City), California at the southeast corner of State Street and Romana Expressway. The proposed project Vicinity Map is provided in Figure 1 below. The Hydrology & Hydraulics Report studies the existing and proposed condition drainage system and patterns. This study follows the requirements of the Riverside County Flood Control and Water Conservation District (RCFCWD) and the Riverside County Hydrology Manual (RCHM), dated 1978 and was prepared for the 10- and 100-year storm events for both the existing and proposed condition. The following sections include the general project characteristics, the drainage design, criteria and methodology.

1.1 Project Description

The Magnet development is proposed for commercial uses. The project will develop a total of 14.4 acres that will include 13 new commercial buildings, paved parking areas, and landscape planter areas along with all associated improvements such as gas, electric, and water utilities. Immediately west of the project is State Street, on the east side is Eagle Drive, on the north side is Ramona Expressway and on the south side the project is bound by undeveloped land.

Figure 1 – Vicinity Map (Not To Scale)



Section 2 Hydrology and Hydraulics Design Criteria, Methodology, and Analysis

2.1 Hydrology Design Criteria and Methodology

The RCHM uses the Rational Method to determine the runoff flow for watershed areas that are less than 300 acres in size. The Synthetic Unit Hydrograph is used for watershed areas larger than 300 to 500 acres. The Rational Method is based on the equation $Q = C \times I \times A$

where:
Q = peak discharge (cfs)
C = runoff coefficient representing the ratio of runoff to rainfall
I = the time-averaged rainfall intensity in inches per hour corresponding to the time of concentration (in/hr)
A = drainage area (acres).

The runoff coefficient is determined from the soil characteristics and the land use types. The time of concentration is the time it takes for the entire watershed to contribute runoff to the concentration point, and it is determined based on the longest flow path. The total drainage area for the site is 14.51 acres, thus only the Rational Method analysis was required. The precipitation depth and intensity was determined per NOAA Atlas 14 is provided in Appendix A. The Rational Method was prepared using the Advance Engineering Software (AES) RATSCX software which is approved by Riverside County for the Rational Method.

In addition to the onsite hydrology analyses, an offsite study was conducted that analyzed the existing Master Plan of the Public Drainage facilities that surround the site. The offsite hydrology analysis consists of a total of 204 acres, thus only the Rational Method analysis is required. The precipitation depth and intensity was determined per NOAA Atlas 14 for the offsite hydrology study.

Per the USDA Natural Resources Conservation Service Soil Survey (USDA NRCS), published in 2006, the project site is located within the hydrology soil group of D. Group D Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist of clays that have a high shrink-swell potential, soils that have a high-water table, soils that have a clay layer at or near the surface. The project site location is shown on the USDA Soil Resource map, included in Appendix B.

2.2 Hydraulics Design Criteria and Methodology

The Water Surface Pressure Gradient (WSPGW) software developed by the Los Angeles County Flood Control District and approved by the County of Riverside was used to calculate the Hydraulic Grade Line (HGL) for the offsite drainage facilities. The WSPG software uses the Bernoulli equation to calculate the HGL for each storm drain line utilizing the flow and the boundary conditions. Boundary conditions were set at the downstream end of the study based on the as-builts for Storm Drain Line H; refer to Section 3 for further information. HGL calculations were conducted to reflect the flows produced from the 10- and 100-year storm events. The storm drain sizing and design was based on an HGL that lies 2-feet below ground surface for the 10-year storm event.

Section 3 Hydrology Study

The following sections present the hydrologic analysis of the project site in the existing and proposed condition as well as the findings of the offsite hydrology study in the existing condition.

3.1 Onsite Existing Condition Hydrology Analysis

The project site is located within Zone 4 of the RCFCD drainage system (Riverside County Flood Control District). The project discharges to county storm drain Line H which discharges to an open channel that runs from Ramona Expressway and discharges to San Jacinto River. San Jacinto River conveys flows to Canyon Lake and then to Lake Elsinore. Lake Elsinore discharges to Temescal Creek which connects to Prado Basin, then to Santa Ana River and ultimately discharges to the Pacific Ocean. See Appendix C for Watershed and Downstream Tributary Maps. The topography of the project site is relatively flat with slopes varying from 0.1 %to 0.6%. Site elevations range from 1520-1528 feet above Mean Sea Level. The existing site is a vacant lot of barren dirt with two existing concrete driveways along Ramona Expressway.

The runoff produced in the existing condition sheet flows from the southeast corner of the site to the northwest corner of the site and discharges onto Ramona Expressway where it is captured by an existing catch basin that conveys the flows to an open channel via an underground 4'x8' reinforced concrete box (RCB). Flows from the vacant lot to the south of the project also run on to the site location. However, these flows are neglected in the existing condition analysis as they will be diverted away from the site in the proposed condition. Thus, the overall onsite hydrologic analysis will compare the flows generated from the same acreage of land from existing to proposed condition. The Existing Onsite Hydrology Map is provided in Appendix D and it depicts drainage subareas, elevations, flow lengths and slopes used for the hydrology calculations. The existing condition 10- and 100-year storm events Rational Method Analysis results are also included in Appendix D.

3.2 Onsite Proposed Condition Hydrology Analysis

The proposed site will mimic existing drainage patterns with flow going from the southeast corner to the northwest corner of the site. Runoff will sheet flow to a proposed storm drain system that discharges to two underground infiltration basins with a total storage volume of 30,723 CF to treat the required Design Capture Volume for the project. Manholes with weirs are proposed downstream of the basins for the high flows which will conveyed to a private storm drain system and ultimately discharge to a proposed 48-inch RCP beneath State St. via a new on-site storm drain facility. The southern boundary of the proposed site will contain a retaining curb that will effectively divert the flows coming towards the site from the adjacent vacant lot. The rest of the project site is relatively flat with slopes varying from 0.5% to 3%. Site

elevations range from 1518-1527 feet above Mean Sea Level. The proposed site includes 13 new buildings with associated parking areas and commercial landscape areas. The overall site will contain mostly asphalt or concrete surfaces with an approximate imperviousness of 90%.

The Proposed Onsite Hydrology Map is provided in Appendix E and it depicts drainage subareas, elevations, flow lengths and slopes used for the hydrology calculations. The proposed condition 10- and 100-year storm events Rational Method analysis results are also included in Appendix E.

3.3 Offsite Hydrology Study

This Section describes the hydrologic conditions of the area surrounding the project and the flows that are expected to be conveyed by the public offsite storm drain facilities. Appendix F provides an exhibit detailing all storm drain facilities referenced in the following sections.

3.3.1 Offsite Study Background and Purpose

The San Jacinto Valley Master Drainage Plan Update (SJMDPU) prepared in 2010 by Webb & Associates analyzed the hydrologic and hydraulic conditions of proposed Master Plan facility Line H. The study is based on the 1982 Master Plan prepared by Riverside County Flood Control & Water Quality District (RCFC&WCD) that depicts Line H to be a 60-inch Reinforced Concrete Pipe with one tributary Master Plan facility Line H-1. In 2012, the City built three storm drain lines at the intersection of Ramona Expressway and State Street, Master Plan Facility Lines: H, H-2, and H-3. Per communications with the City, no Hydrology studies were prepared at the time these lines were built. Additionally, Ramona Expressway was widened in 2014 and along with this improvement was the construction of a 24-inch storm drain line, located east of the intersection of Ramona Expressway and Eagle Road that connects to Line H-3.

With the development of the Magnet, the City has requested the extension of Line H-2 along State Street within the limits of the project as well as the construction of Master Plan facility Line H-1. These lines were analyzed in this study and the narrative below provides a summary of the findings for each proposed storm drain line.

3.3.2 Master Plan Line H

Per the as-built plans prepared by the City in 2012, Line H is an 8'x4' RCB that begins at an earthen channel along State Street and terminates at a 28-foot catch basin at the corner of State Street and Ramona Expressway. This line was designed to convey 283 cfs of flow from the 100-year storm event. Connecting to this line are storm drain Lines H-2 and H-3. This study analyzed the hydrology for the 100-year storm event to the most upstream end of Line H. However, the hydraulics of Line H was not analyzed in this study and the HGL was taken from the as-builts.

3.3.3 Master Plan Line H-1

Per the SJMPDU, Line H-1 was a proposed 48-inch RCP that would convey approximately 105 acres of area from the housing tracts East of Eagle Road. During the review of current existing drainage patterns, about 8.5 acres of undeveloped private property south of the Magnet would drain towards the proposed location of Line H-1. The residential developments east of Eagle Road were found to drain mostly to Ramona Expressway and Line H-3, with a portion of the development draining to Idyllwild Drive that ultimately flows to Line H-2. Construction of Line H-1 is found to be unnecessary since the existing drainage facility Lines H-2 and H-3 currently convey the flows originally tabled for Line H-1.

3.3.4 Master Plan Line H-2

Per the as-built plans prepared by the City in 2012, Line H-2 is a 48-inch RCP that connects to Line H and runs along State Street, terminating at a junction structure with a 24-inch RCP lateral that connects to a 28-foot catch basin. The drainage delineation conducted in this study shows that approximately 127 acres of surface runoff, which includes the 14.5-acre Magnet development, flow towards Line H-2. The Proposed Offsite Hydrology Map in Appendix G includes the flows paths, drainage areas, land types, and soil types that are tributary to this Line. The Offsite Rational Method study results show that approximately 99.24 cfs of flow drains to Line H-2 in the 10-year storm event (Appendix G).

3.3.5 Master Plan Line H-3

The 2012 plans prepared by the City show Line H-3 as a 36-inch RCP that connects to Line H. It is located on the east side of the intersection of Ramona Expressway and State Street, terminating at a junction structure that connects to an 18-inch RCP lateral. This lateral connects to a 12-foot catch basin located north of the project site. As part of the 2014 widening of Ramona Expressway, a 24-inch RCP extension was constructed that discharges to the existing 14’ catch basin and runs easterly on Ramona Expressway. The 24-inch line has three 4-foot catch basins that collect surface runoff from the street. Approximately 58.7 acres of area is tributary to Line H-3 which generates 49.59 cfs of flow in the 10-yr storm event. See Appendix G for Offsite Rational Method Calculations.

Section 4 Hydraulics Study

The following sections summarize the Hydraulic analysis prepared for Lines H-2 and H-3. All WSPG calculation inputs and outputs, and the HGL profiles can be found in Appendix H.

4.1 Master Plan Line H-2 Hydraulic Study

The Hydraulic conditions of Master Plan Line H-2 was analyzed under its existing condition as well as the proposed extension per request of the City. The WSPG calculations for the 48-inch Line H-2 show an HGL for the 10-year storm event that lies beneath the existing surface with 12-inches of freeboard. The Hydraulic calculations for Line H-2 utilized the existing off-site flows and the proposed Magnet development flows.

4.2 Master Plan Line H-3 Hydraulic Study

The Hydraulic conditions of Master Plan Line H-3 was analyzed under its existing condition for the 10-year storm event. The WSPG calculations for Line H-3 indicate that the 36” RCP was size adequately for the 10 year flows; however, upstream of the 36” line , the line does not have the capacity for the 10 year flows due to an existing 18” RCP lateral connecting the 24” RCP and the 36” RCP. Additionally the 24” RCP constructed as part of Ramona widening in 2014 does not have the capacity to convey 10 year flows. The Magnet Development will not discharge any flows to Line H-3; therefore, no improvements are proposed for this line.

Section 5 Summary of Results and Conclusions

5.1 Onsite Study

The Onsite Hydrology study was conducted for the 10- and 100-year storm events for both the existing and the proposed conditions. The proposed site contains a higher imperviousness than the existing site which increases the flows being discharged off-site in the final condition. Rational Method results are shown in the table below:

Table 1: Onsite Flow Summary

Condition	10-year Flows (cfs)	100-year Flows (cfs)
Existing	11.97	27.87
Proposed	18.06	36.95

5.2 Offsite Study

The Offsite Rational Method analyses was conducted to determine the proposed flows that are conveyed to Master Plan Lines H-2 and H-3. The calculations were conducted for the 10- and 100-year storm events and the results are listed below:

Table 1: Offsite Flow Summary

Line	10-year Flows (cfs)	100-year Flows (cfs)	Tributary Area (ac)
H-2	99.24	223.39	134.39
H-3	49.59	106.61	51.53

5.3 Conclusions

The proposed Magnet development will cause an increase in peak flows in both the 10- and 100-yr storm events. The WSPG analysis shows that the proposed 48-inch RCP extension to Line H-2 will have capacity to convey the 10-yr storm event without the need for onsite flow mitigation. The developer's construction of the Line H-2 extension will be provided to capture the onsite flows from the Magnet Development and to benefit the City in the future plans to complete the Master Plan of Drainage facilities that would alleviate potential flooding within the surface.

TECHNICAL APPENDIX

Appendix A – NOAA Precipitation Data

NOAA Atlas 14, Volume 6, Version 2
Location name: San Jacinto, California, USA*
Latitude: 33.8005°, Longitude: -116.97°
Elevation: 1524 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.082** (0.069-0.100)	**0.112** (0.094-0.136)	**0.158** (0.131-0.192)	**0.201** (0.166-0.246)	**0.270** (0.215-0.342)	**0.332** (0.259-0.431)	**0.405** (0.308-0.538)	**0.491** (0.363-0.672)	**0.653** (0.462-0.933)	**0.873** (0.596-1.29)
10-min	**0.118** (0.099-0.143)	**0.161** (0.134-0.195)	**0.226** (0.188-0.275)	**0.288** (0.238-0.353)	**0.387** (0.308-0.491)	**0.477** (0.371-0.617)	**0.581** (0.441-0.772)	**0.704** (0.520-0.963)	**0.936** (0.662-1.34)	**1.25** (0.854-1.85)
15-min	**0.143** (0.119-0.173)	**0.194** (0.162-0.235)	**0.274** (0.228-0.332)	**0.349** (0.288-0.427)	**0.468** (0.373-0.594)	**0.576** (0.449-0.747)	**0.702** (0.534-0.933)	**0.851** (0.628-1.16)	**1.13** (0.800-1.62)	**1.51** (1.03-2.24)
30-min	**0.228** (0.190-0.275)	**0.309** (0.258-0.375)	**0.436** (0.362-0.529)	**0.555** (0.458-0.679)	**0.745** (0.594-0.945)	**0.917** (0.715-1.19)	**1.12** (0.849-1.48)	**1.36** (1.00-1.85)	**1.80** (1.27-2.57)	**2.41** (1.64-3.56)
60-min	**0.359** (0.300-0.433)	**0.488** (0.407-0.590)	**0.687** (0.571-0.833)	**0.874** (0.721-1.07)	**1.17** (0.936-1.49)	**1.44** (1.13-1.87)	**1.76** (1.34-2.34)	**2.14** (1.58-2.92)	**2.84** (2.01-4.06)	**3.80** (2.59-5.62)
2-hr	**0.542** (0.453-0.656)	**0.696** (0.581-0.842)	**0.925** (0.769-1.12)	**1.13** (0.936-1.39)	**1.46** (1.16-1.85)	**1.74** (1.36-2.26)	**2.06** (1.57-2.74)	**2.43** (1.80-3.33)	**3.00** (2.12-4.29)	**3.83** (2.62-5.67)
3-hr	**0.663** (0.554-0.802)	**0.835** (0.697-1.01)	**1.09** (0.905-1.32)	**1.32** (1.08-1.61)	**1.66** (1.32-2.11)	**1.96** (1.53-2.54)	**2.30** (1.75-3.05)	**2.68** (1.98-3.66)	**3.26** (2.30-4.65)	**3.87** (2.64-5.73)
6-hr	**0.929** (0.776-1.12)	**1.15** (0.961-1.39)	**1.47** (1.22-1.79)	**1.76** (1.45-2.15)	**2.18** (1.74-2.76)	**2.54** (1.98-3.29)	**2.93** (2.23-3.90)	**3.38** (2.49-4.62)	**4.03** (2.85-5.76)	**4.60** (3.14-6.80)
12-hr	**1.21** (1.01-1.47)	**1.51** (1.26-1.83)	**1.94** (1.61-2.35)	**2.32** (1.91-2.84)	**2.88** (2.29-3.65)	**3.35** (2.61-4.34)	**3.86** (2.94-5.13)	**4.44** (3.28-6.07)	**5.29** (3.74-7.55)	**6.01** (4.10-8.89)
24-hr	**1.61** (1.42-1.85)	**2.04** (1.80-2.36)	**2.66** (2.35-3.08)	**3.21** (2.80-3.74)	**4.02** (3.40-4.84)	**4.69** (3.89-5.77)	**5.43** (4.40-6.84)	**6.25** (4.93-8.09)	**7.46** (5.65-10.1)	**8.49** (6.22-11.8)
2-day	**1.97** (1.74-2.27)	**2.57** (2.27-2.97)	**3.41** (3.01-3.95)	**4.14** (3.62-4.84)	**5.20** (4.40-6.27)	**6.07** (5.04-7.47)	**7.01** (5.68-8.82)	**8.03** (6.33-10.4)	**9.51** (7.20-12.8)	**10.7** (7.86-14.9)
3-day	**2.17** (1.92-2.51)	**2.89** (2.55-3.34)	**3.88** (3.42-4.49)	**4.73** (4.14-5.52)	**5.95** (5.04-7.18)	**6.95** (5.76-8.54)	**8.00** (6.49-10.1)	**9.15** (7.22-11.8)	**10.8** (8.17-14.5)	**12.1** (8.88-16.9)
4-day	**2.32** (2.05-2.68)	**3.13** (2.76-3.61)	**4.24** (3.74-4.91)	**5.18** (4.53-6.05)	**6.54** (5.53-7.88)	**7.63** (6.33-9.38)	**8.78** (7.12-11.1)	**10.0** (7.90-13.0)	**11.8** (8.93-15.9)	**13.2** (9.69-18.4)
7-day	**2.61** (2.31-3.01)	**3.62** (3.19-4.17)	**4.99** (4.40-5.77)	**6.15** (5.38-7.18)	**7.80** (6.60-9.40)	**9.12** (7.56-11.2)	**10.5** (8.52-13.2)	**12.0** (9.46-15.5)	**14.1** (10.7-19.0)	**15.8** (11.6-22.0)
10-day	**2.82** (2.50-3.26)	**3.97** (3.51-4.58)	**5.53** (4.87-6.40)	**6.84** (5.98-7.99)	**8.71** (7.37-10.5)	**10.2** (8.46-12.5)	**11.8** (9.54-14.8)	**13.4** (10.6-17.4)	**15.8** (12.0-21.3)	**17.7** (13.0-24.7)
20-day	**3.49** (3.09-4.03)	**4.96** (4.39-5.73)	**6.96** (6.14-8.06)	**8.65** (7.57-10.1)	**11.0** (9.35-13.3)	**13.0** (10.8-15.9)	**15.0** (12.1-18.9)	**17.1** (13.5-22.2)	**20.2** (15.3-27.2)	**22.6** (16.6-31.5)
30-day	**4.10** (3.63-4.73)	**5.81** (5.14-6.71)	**8.15** (7.18-9.44)	**10.1** (8.86-11.8)	**12.9** (11.0-15.6)	**15.2** (12.6-18.7)	**17.6** (14.2-22.1)	**20.1** (15.9-26.0)	**23.7** (18.0-32.0)	**26.7** (19.5-37.1)
45-day	**4.90** (4.33-5.65)	**6.88** (6.08-7.94)	**9.59** (8.45-11.1)	**11.9** (10.4-13.9)	**15.2** (12.9-18.3)	**17.8** (14.8-21.9)	**20.6** (16.7-26.0)	**23.7** (18.7-30.6)	**28.0** (21.2-37.7)	**31.5** (23.1-43.9)
60-day	**5.71** (5.05-6.59)	**7.94** (7.01-9.16)	**11.0** (9.69-12.7)	**13.6** (11.9-15.9)	**17.4** (14.7-20.9)	**20.4** (16.9-25.1)	**23.6** (19.1-29.7)	**27.1** (21.4-35.1)	**32.1** (24.3-43.2)	**36.2** (26.5-50.4)

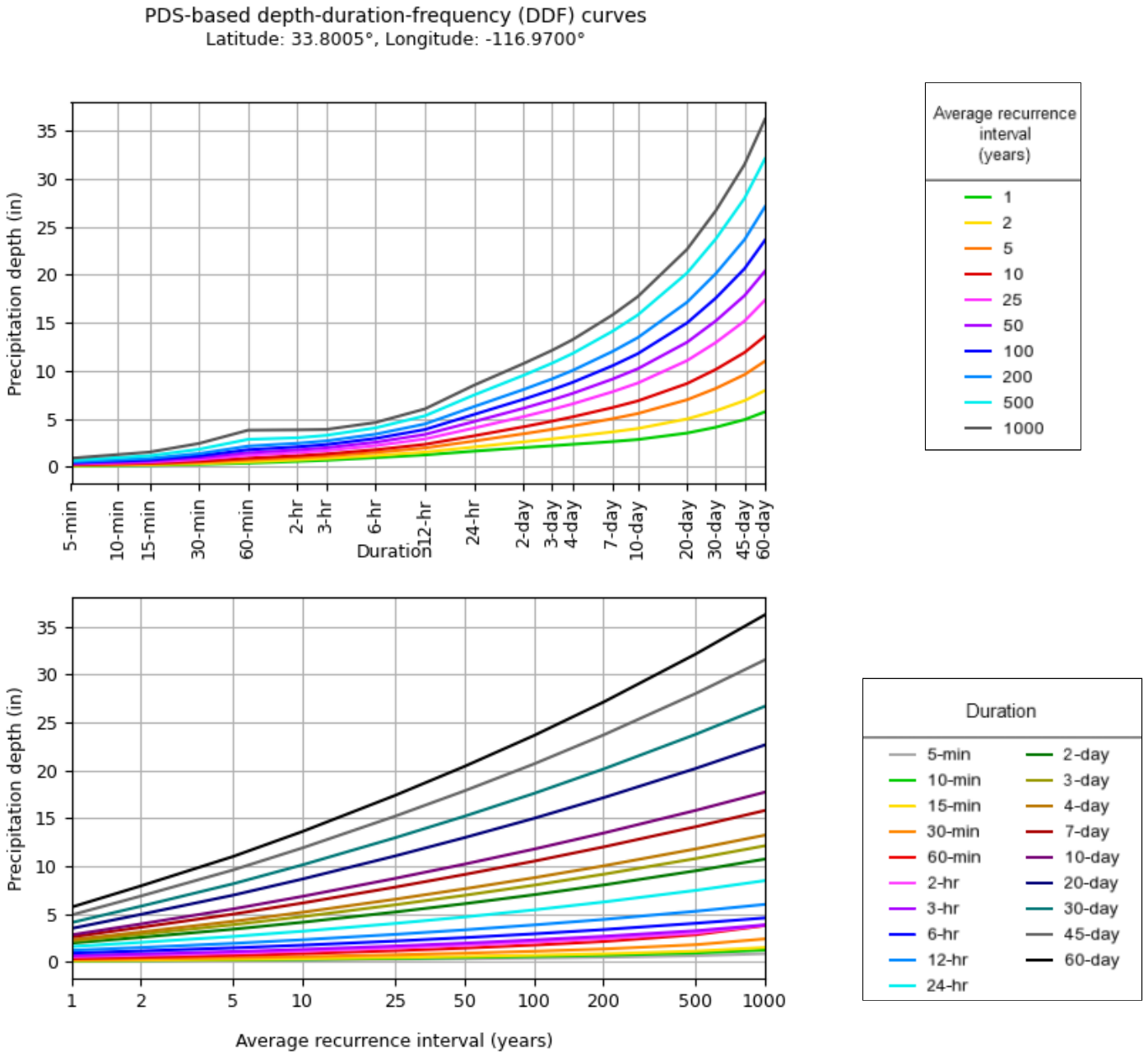
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical



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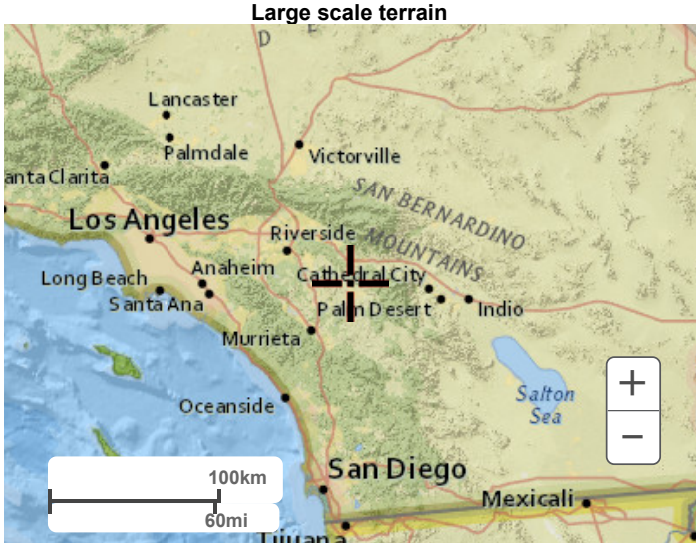
Back to Top

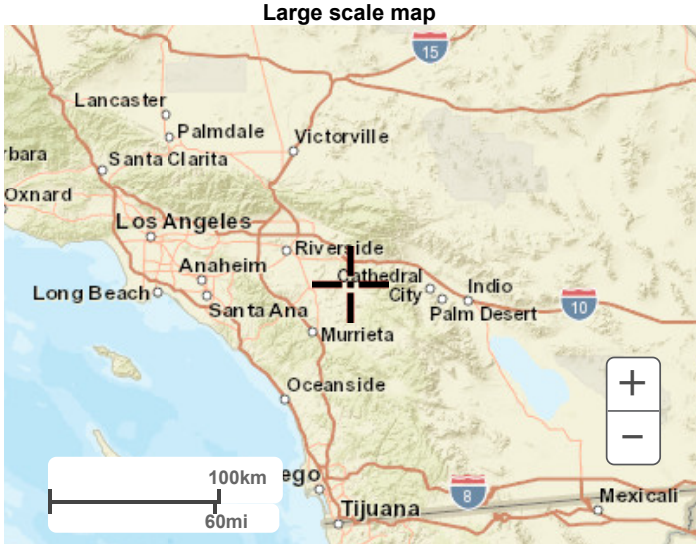
Maps & aerials

Small scale terrain

Large scale terrain



Large scale map



Large scale aerial

Back to Top

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National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

NOAA Atlas 14, Volume 6, Version 2
Location name: San Jacinto, California, USA*
Latitude: 33.8005°, Longitude: -116.97°
Elevation: 1524 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches/hour)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	**0.984** (0.828-1.20)	**1.34** (1.13-1.63)	**1.90** (1.57-2.30)	**2.41** (1.99-2.95)	**3.24** (2.58-4.10)	**3.98** (3.11-5.17)	**4.86** (3.70-6.46)	**5.89** (4.36-8.06)	**7.84** (5.54-11.2)	**10.5** (7.15-15.5)
10-min	**0.708** (0.594-0.858)	**0.966** (0.804-1.17)	**1.36** (1.13-1.65)	**1.73** (1.43-2.12)	**2.32** (1.85-2.95)	**2.86** (2.23-3.70)	**3.49** (2.65-4.63)	**4.22** (3.12-5.78)	**5.62** (3.97-8.02)	**7.51** (5.12-11.1)
15-min	**0.572** (0.476-0.692)	**0.776** (0.648-0.940)	**1.10** (0.912-1.33)	**1.40** (1.15-1.71)	**1.87** (1.49-2.38)	**2.30** (1.80-2.99)	**2.81** (2.14-3.73)	**3.40** (2.51-4.66)	**4.53** (3.20-6.47)	**6.05** (4.13-8.96)
30-min	**0.456** (0.380-0.550)	**0.618** (0.516-0.750)	**0.872** (0.724-1.06)	**1.11** (0.916-1.36)	**1.49** (1.19-1.89)	**1.83** (1.43-2.38)	**2.24** (1.70-2.97)	**2.71** (2.00-3.71)	**3.60** (2.55-5.15)	**4.82** (3.29-7.13)
60-min	**0.359** (0.300-0.433)	**0.488** (0.407-0.590)	**0.687** (0.571-0.833)	**0.874** (0.721-1.07)	**1.17** (0.936-1.49)	**1.44** (1.13-1.87)	**1.76** (1.34-2.34)	**2.14** (1.58-2.92)	**2.84** (2.01-4.06)	**3.80** (2.59-5.62)
2-hr	**0.271** (0.226-0.328)	**0.348** (0.290-0.421)	**0.462** (0.384-0.561)	**0.567** (0.468-0.694)	**0.729** (0.581-0.924)	**0.870** (0.679-1.13)	**1.03** (0.784-1.37)	**1.22** (0.898-1.66)	**1.50** (1.06-2.14)	**1.92** (1.31-2.84)
3-hr	**0.220** (0.184-0.267)	**0.278** (0.232-0.336)	**0.361** (0.301-0.439)	**0.437** (0.361-0.536)	**0.553** (0.441-0.701)	**0.653** (0.509-0.846)	**0.764** (0.581-1.02)	**0.891** (0.658-1.22)	**1.08** (0.766-1.55)	**1.29** (0.879-1.91)
6-hr	**0.155** (0.129-0.187)	**0.192** (0.160-0.232)	**0.245** (0.204-0.298)	**0.293** (0.241-0.359)	**0.364** (0.290-0.461)	**0.424** (0.330-0.549)	**0.489** (0.372-0.651)	**0.563** (0.416-0.771)	**0.673** (0.476-0.962)	**0.767** (0.523-1.14)
12-hr	**0.100** (0.084-0.121)	**0.125** (0.104-0.151)	**0.160** (0.133-0.195)	**0.192** (0.158-0.235)	**0.238** (0.190-0.302)	**0.277** (0.216-0.359)	**0.320** (0.243-0.426)	**0.368** (0.271-0.503)	**0.438** (0.310-0.626)	**0.498** (0.340-0.738)
24-hr	**0.067** (0.059-0.077)	**0.085** (0.075-0.098)	**0.110** (0.097-0.128)	**0.133** (0.116-0.155)	**0.167** (0.141-0.201)	**0.195** (0.162-0.240)	**0.226** (0.183-0.284)	**0.260** (0.205-0.337)	**0.310** (0.235-0.418)	**0.353** (0.259-0.492)
2-day	**0.041** (0.036-0.047)	**0.053** (0.047-0.061)	**0.071** (0.062-0.082)	**0.086** (0.075-0.100)	**0.108** (0.091-0.130)	**0.126** (0.104-0.155)	**0.145** (0.118-0.183)	**0.167** (0.131-0.216)	**0.198** (0.150-0.266)	**0.223** (0.163-0.311)
3-day	**0.030** (0.026-0.034)	**0.040** (0.035-0.046)	**0.053** (0.047-0.062)	**0.065** (0.057-0.076)	**0.082** (0.070-0.099)	**0.096** (0.080-0.118)	**0.111** (0.090-0.139)	**0.127** (0.100-0.164)	**0.149** (0.113-0.201)	**0.168** (0.123-0.234)
4-day	**0.024** (0.021-0.027)	**0.032** (0.028-0.037)	**0.044** (0.038-0.051)	**0.054** (0.047-0.063)	**0.068** (0.057-0.082)	**0.079** (0.065-0.097)	**0.091** (0.074-0.115)	**0.104** (0.082-0.135)	**0.122** (0.093-0.165)	**0.137** (0.100-0.191)
7-day	**0.015** (0.013-0.017)	**0.021** (0.019-0.024)	**0.029** (0.026-0.034)	**0.036** (0.032-0.042)	**0.046** (0.039-0.055)	**0.054** (0.045-0.066)	**0.062** (0.050-0.078)	**0.071** (0.056-0.092)	**0.083** (0.063-0.113)	**0.094** (0.068-0.130)
10-day	**0.011** (0.010-0.013)	**0.016** (0.014-0.019)	**0.023** (0.020-0.026)	**0.028** (0.024-0.033)	**0.036** (0.030-0.043)	**0.042** (0.035-0.052)	**0.049** (0.039-0.061)	**0.056** (0.044-0.072)	**0.065** (0.049-0.088)	**0.073** (0.054-0.102)
20-day	**0.007** (0.006-0.008)	**0.010** (0.009-0.011)	**0.014** (0.012-0.016)	**0.018** (0.015-0.021)	**0.023** (0.019-0.027)	**0.026** (0.022-0.033)	**0.031** (0.025-0.039)	**0.035** (0.028-0.046)	**0.042** (0.031-0.056)	**0.047** (0.034-0.065)
30-day	**0.005** (0.005-0.006)	**0.008** (0.007-0.009)	**0.011** (0.009-0.013)	**0.014** (0.012-0.016)	**0.017** (0.015-0.021)	**0.021** (0.017-0.025)	**0.024** (0.019-0.030)	**0.027** (0.022-0.036)	**0.032** (0.024-0.044)	**0.037** (0.027-0.051)
45-day	**0.004** (0.004-0.005)	**0.006** (0.005-0.007)	**0.008** (0.007-0.010)	**0.011** (0.009-0.012)	**0.014** (0.011-0.016)	**0.016** (0.013-0.020)	**0.019** (0.015-0.024)	**0.021** (0.017-0.028)	**0.025** (0.019-0.034)	**0.029** (0.021-0.040)
60-day	**0.003** (0.003-0.004)	**0.005** (0.004-0.006)	**0.007** (0.006-0.008)	**0.009** (0.008-0.011)	**0.012** (0.010-0.014)	**0.014** (0.011-0.017)	**0.016** (0.013-0.020)	**0.018** (0.014-0.024)	**0.022** (0.016-0.030)	**0.025** (0.018-0.035)

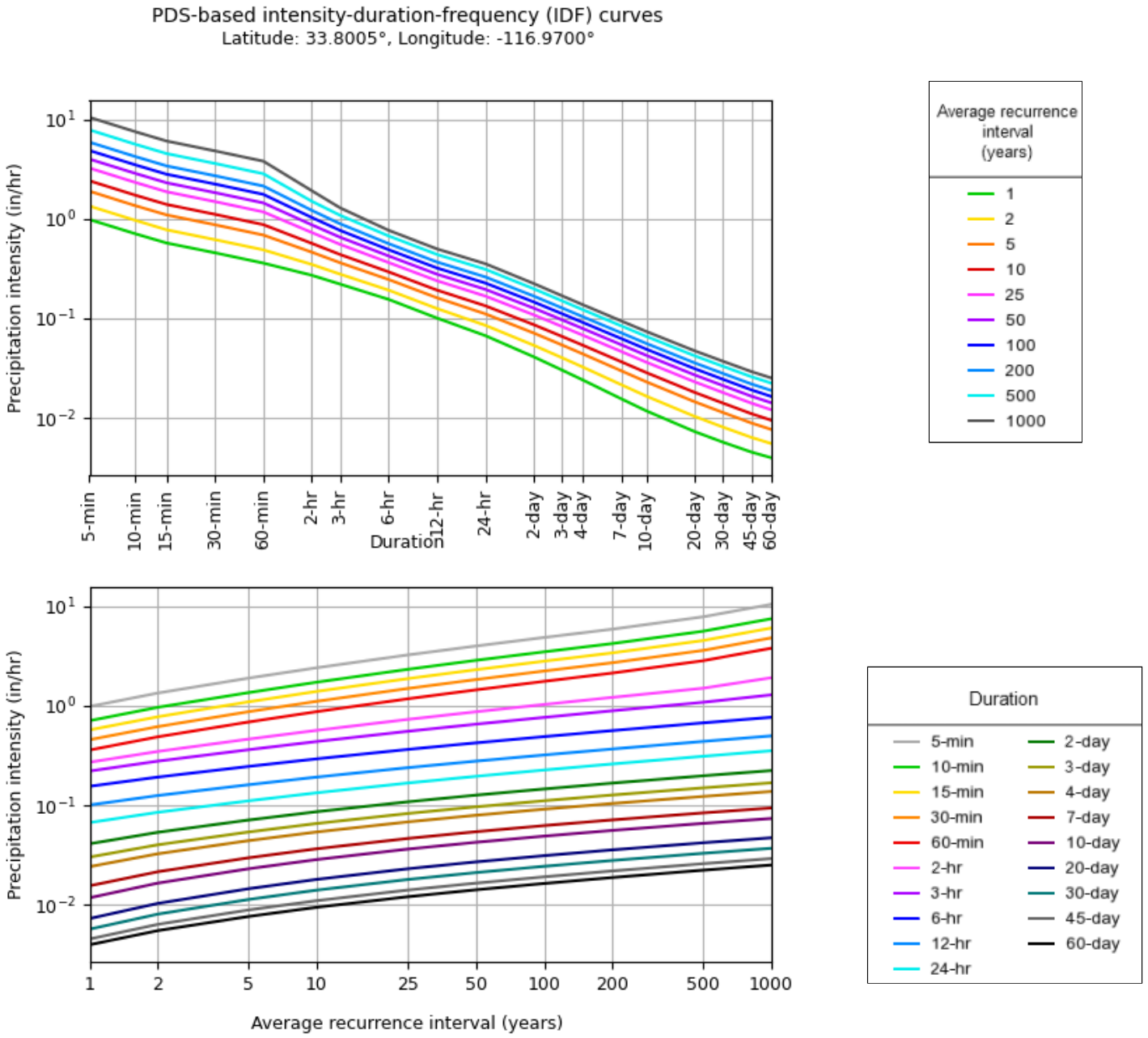
[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

Back to Top

PF graphical



NOAA Atlas 14, Volume 6, Version 2

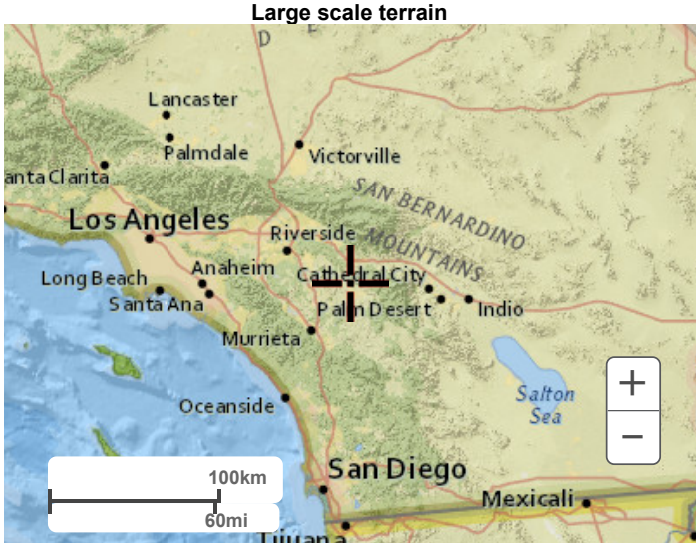
Created (GMT): Wed Jun 21 14:43:02 2023

Back to Top

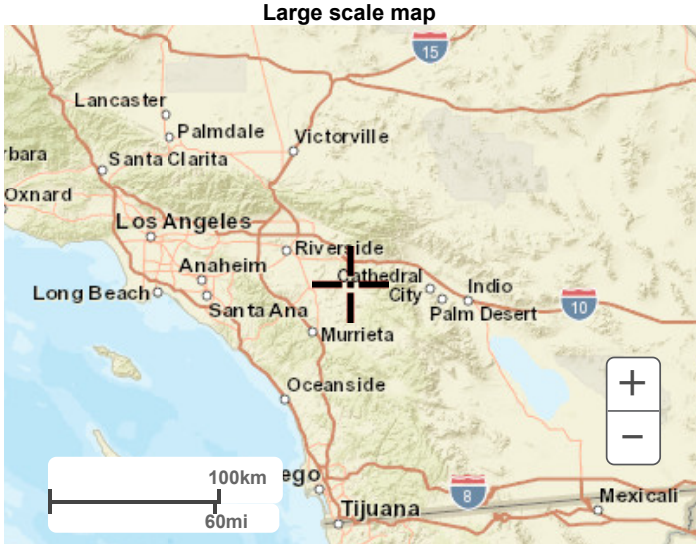
Maps & aerials

Small scale terrain

Large scale terrain



Large scale map



Large scale aerial

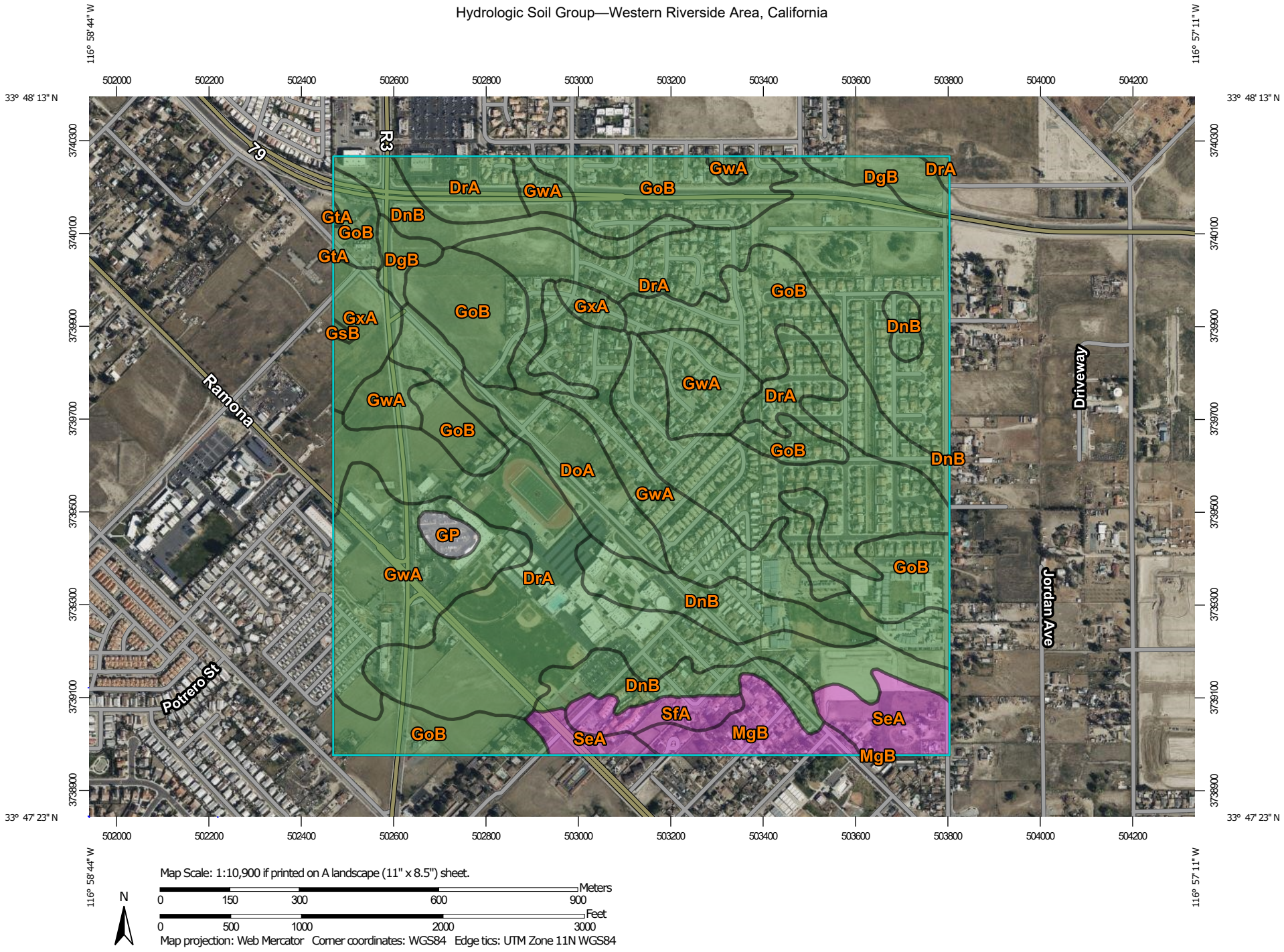
Back to Top

US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Appendix B – USGS Soil Survey

Hydrologic Soil Group—Western Riverside Area, California



MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Western Riverside Area, California
Survey Area Data: Version 15, Sep 6, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 15, 2022—May 28, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
DgB	Dello loamy sand, 0 to 5 percent slopes	A/D	8.5	2.0%
DnB	Dello loamy sand, gravelly substratum, 0 to 5 percent s lopes	A/D	36.4	8.5%
DoA	Dello loamy fine sand, 0 to 2 percent slopes	A/D	14.2	3.3%
DrA	Dello loamy fine sand, gravelly substratum, 0 to 2 percent slopes	A/D	167.5	39.2%
GoB	Grangeville loamy fine sand, drained, 0 to 5 percent slopes	A/D	86.6	20.3%
GP	Gravel pits		2.3	0.5%
GsB	Grangeville sandy loam, sandy substratum, drained, saline-alkali , 0 to 5 percent slopes	A/D	0.3	0.1%
GtA	Grangeville fine sandy loam, drained, 0 to 2 percent sl opes	A/D	0.2	0.0%
GwA	Grangeville fine sandy loam, loamy substratum, drained, 0 to 2 percent slopes	A/D	72.9	17.1%
GxA	Grangeville fine sandy loam, loamy substratum, drained, saline-a lkali, 0 to 2 percent slopes	A/D	10.3	2.4%
MgB	Metz loamy fine sand, gravelly sand substratum, 0 to 5 percent slopes	A	9.4	2.2%
SeA	San Emigdio fine sandy loam, 0 to 2 percent slopes, occassional frost	A	12.7	3.0%
SfA	San Emigdio fine sandy loam, deep, 0 to 2 percent slopes	A	5.9	1.4%
Totals for Area of Interest			**427.3**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

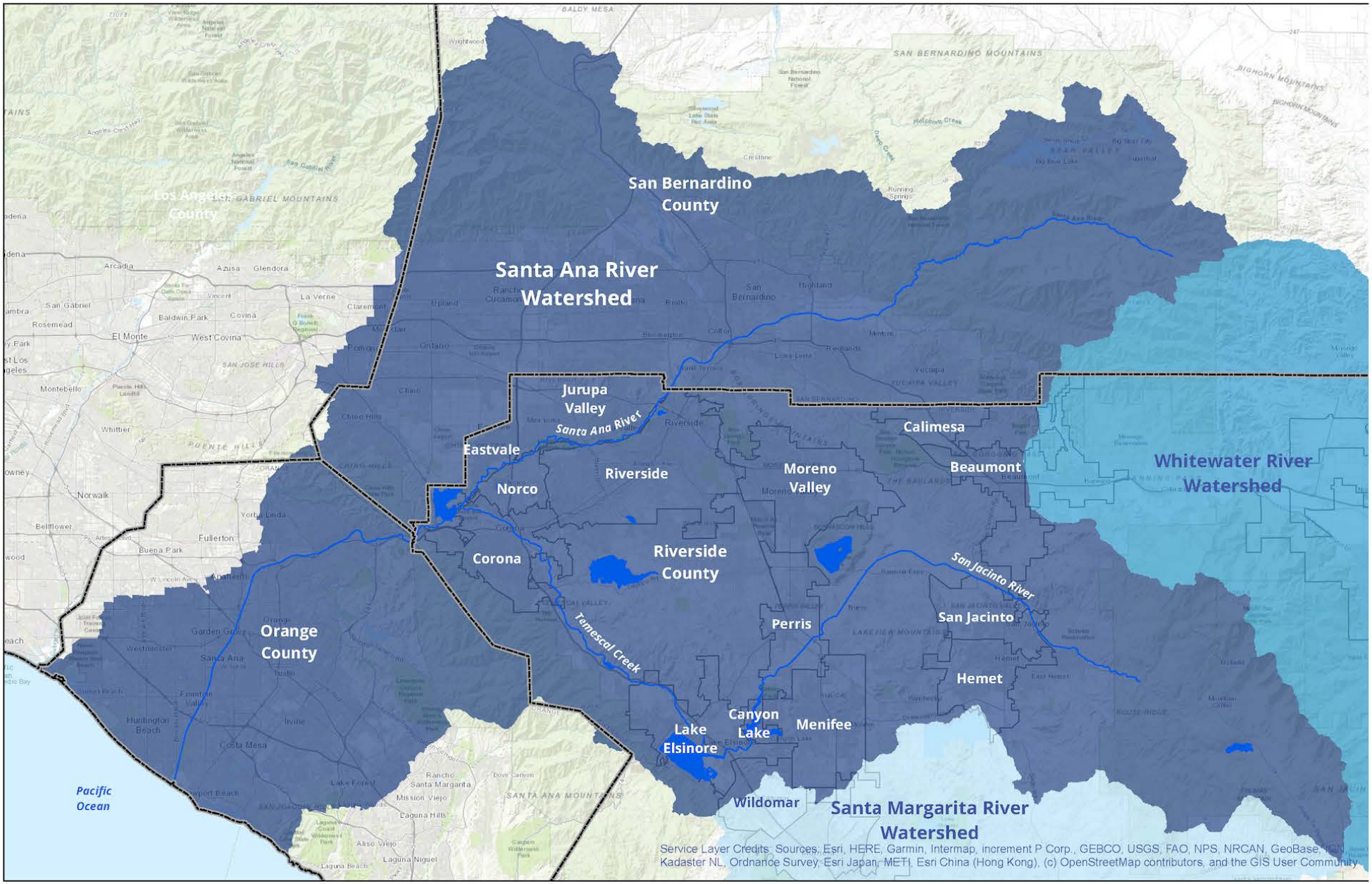
Rating Options

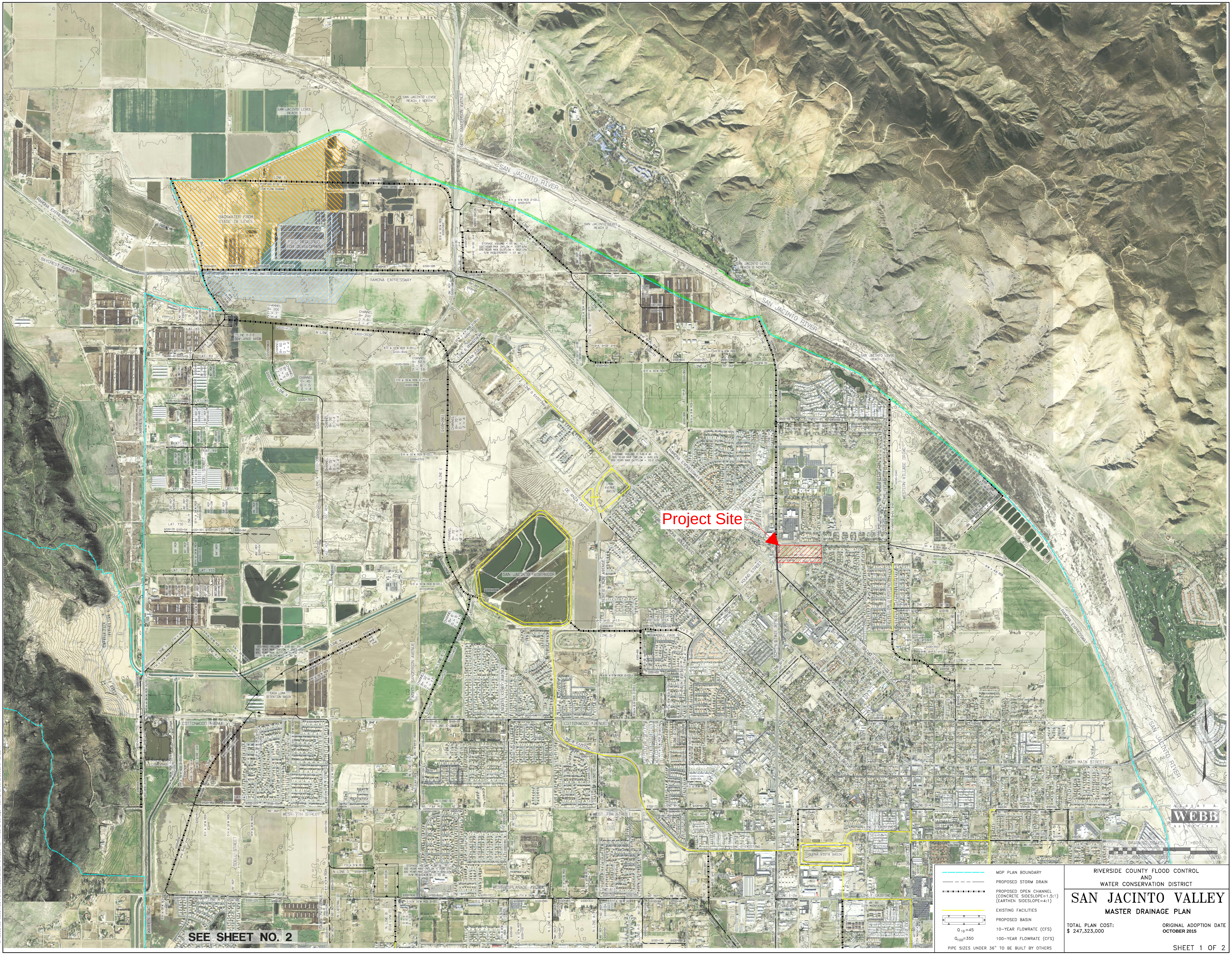
Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

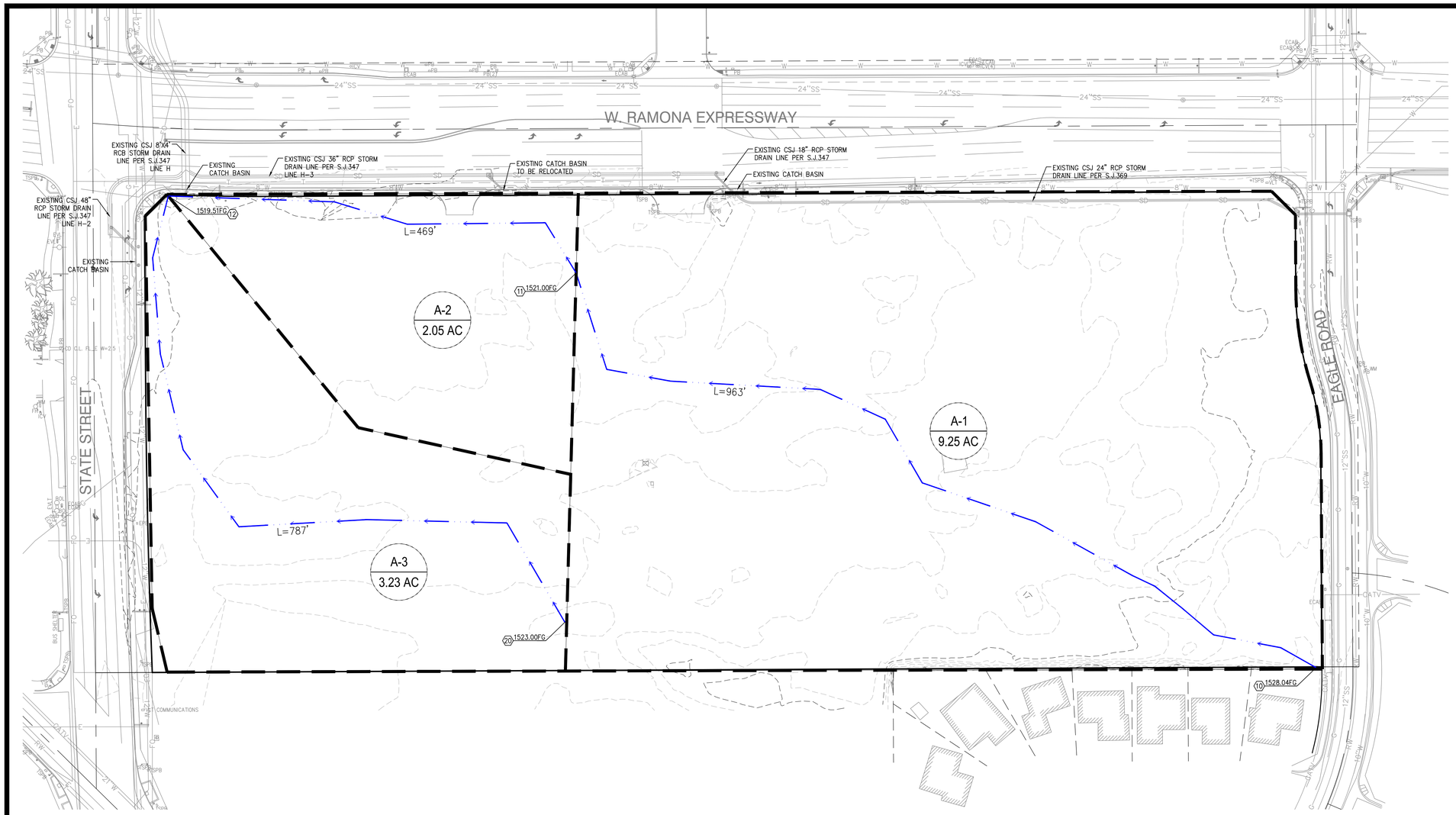
Tie-break Rule: Higher

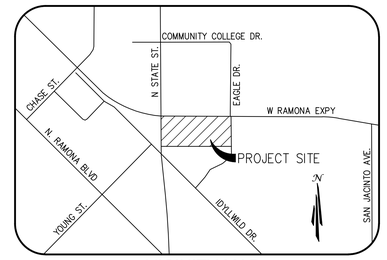
Appendix C – Downstream Receiving Waters Maps


San Bernardino County
Santa Ana River Watershed
Los Angeles County
Jurupa Valley
Santa Ana River
Eastvale
Norco
Riverside
Calimesa
Moreno Valley
Beaumont
Whitewater River Watershed
Corona
Riverside County
Temescal Creek
San Jacinto River
Perris
San Jacinto
Orange County
Hemet
Canyon Lake
Menifee
Lake Elsinore
Wildomar
Santa Margarita River Watershed
Pacific Ocean
Service Layer Credits: Sources, Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community


Project Site
SAN JACINTO RIVER
RAMONA EXPRESSWAY
SEE SHEET NO. 2
GRAPHIC SCALE 1"=800'
MDP PLAN BOUNDARY
PROPOSED STORM DRAIN
PROPOSED OPEN CHANNEL (CONCRETE SIDESLOPE=1.5:1) (EARTHEN SIDESLOPE=4:1)
EXISTING FACILITIES
PROPOSED BASIN
Q10=45 10-YEAR FLOWRATE (CFS)
Q100=350 100-YEAR FLOWRATE (CFS)
PIPE SIZES UNDER 36" TO BE BUILT BY OTHERS
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
SAN JACINTO VALLEY
MASTER DRAINAGE PLAN
TOTAL PLAN COST:
$ 247,323,000
ORIGINAL ADOPTION DATE
OCTOBER 2015
SHEET 1 OF 2

Appendix D – Existing Onsite Hydrology Map and Rational Method





VICINITY MAP
N.T.S.

LEGEND:

- DRAINAGE SUB-BOUNDARY
- SURFACE FLOW PATH
- 10.00FS / 5.00INV (10) — SURFACE ELEVATION, HYDROLOGIC NODE NUMBER, INVERT ELEVATION
- EXISTING SURFACE CONTOUR
- L=1000' — FLOW LENGTH

NO.	DESCRIPTION	BY	DATE

NO.	DESCRIPTION	BY	DATE
	REVISIONS		

2ND CUP SUBMITTAL 01/23/2024

TAIT & ASSOCIATES
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EXISTING HYDROLOGY MAP

THE MAGNET
RICH DEVELOPMENT
600 N TUSTIN, SUITE 150
SAN JACINTO, CA

DRAWN:
DATE: 01/23/2024
CHECKED:
DATE:
REVISION #:
DATE:
JOB NO. SP18950

1 OF 1

PREPARED UNDER THE SUPERVISION OF TAIT & ASSOCIATES, INC.

FOR REVIEW ONLY
NOT FOR CONSTRUCTION

MICHAEL P. SILVEY, P.E. CA P.E. 58651 DATE

Know what's below Call before you dig.

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THE ENGINEER PREPARING THESE PLANS WILL NOT BE RESPONSIBLE FOR, OR LIABLE FOR, UNAUTHORIZED CHANGES TO OR USES OF THESE PLANS. ALL CHANGES OF THESE PLANS MUST BE IN WRITING AND MUST BE APPROVED BY THE PREPARER OF THESE PLANS PRIOR TO CONSTRUCTION. CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY, THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD DESIGN PROFESSIONAL HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF DESIGN PROFESSIONAL.

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THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITIES, PIPES, AND/OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. THERE MAYBE EXISTING UTILITIES NOT SHOWN ON THESE PLANS. THE CONTRACTOR SHALL ASCERTAIN THE TRUE VERTICAL AND HORIZONTAL LOCATION OF THOSE UNDERGROUND UTILITIES TO BE USED PRIOR TO CONSTRUCTION AND SHALL BE RESPONSIBLE FOR ANY DAMAGE TO ANY PUBLIC OR PRIVATE UTILITIES, SHOWN OR NOT SHOWN HEREON.

BASIS OF BEARINGS:
THE CENTERLINE OF IDYLLWILD DRIVE BEING NORTH 45°17'48" WEST PER TRACT NO. 22882-1 M.B. 203 / 77-81

BENCH MARK:
U.S.C. & G.S. DESIGNATION V 1143

DESCRIPTION: NEAREST TOWN: SAN JACINTO COUNTY: RIVERSIDE
DISTANCE AND DIRECTION FROM NEAREST TOWN 2.35 MILES NORTHWEST
CHARACTER OF MARK C&GS BENCHMARK DISK STAMPED V1143 1961

ELEVATION: 1505.492 (NAVD 1929)

Jan 23, 2024 - 11:22am by cescobedo K:\Drawings\SP\SP18950 - San Jacinto\ENG\Hydrology\SP18950_ONSITE EX.dwg

```
******************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
        RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                    (RCFC&WCD)  1978 HYDROLOGY MANUAL
         (c) Copyright 1982-2016 Advanced Engineering Software (aes)
                    (Rational Tabling Version 23.0)
                Release Date: 07/01/2016  License ID 1334

                          Analysis prepared by:
```

```
 ************************* DESCRIPTION OF STUDY *************************
* SP8950 SAN JACINTO                                                    *
* EXISTING ONSITE RATIONAL METHOD                                       *
* 10-YEAR STORM EVENT  PJ                                               *
 ************************************************************************

  FILE NAME: SJ10REX.DAT
  TIME/DATE OF STUDY: 08:16 07/19/2023
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  1.730
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.874
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  3.490
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.760
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.3810757
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.3820757
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =   10.00   1-HOUR INTENSITY(INCH/HOUR) =   0.883
  SLOPE OF INTENSITY DURATION CURVE = 0.3811
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
        AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
  *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     11.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   963.00
  UPSTREAM ELEVATION(FEET) =   1528.04
  DOWNSTREAM ELEVATION(FEET) =   1521.00
  ELEVATION DIFFERENCE(FEET) =      7.04
  TC = 0.533*[(  963.00**3)/(     7.04)]**.2 =   22.236
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.289
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6692
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      7.98
  TOTAL AREA(ACRES) =      9.25   TOTAL RUNOFF(CFS) =      7.98

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     12.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1521.00  DOWNSTREAM(FEET) =   1519.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =   469.00   CHANNEL SLOPE =  0.0032
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   0.50
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.146
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6486
  SOIL CLASSIFICATION IS "D"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.98
  AVERAGE FLOW DEPTH(FEET) =   0.42   TRAVEL TIME(MIN.) =   7.98
  Tc(MIN.) =   30.22
  SUBAREA AREA(ACRES) =     2.05       SUBAREA RUNOFF(CFS) =    1.52
  TOTAL AREA(ACRES) =       11.3         PEAK FLOW RATE(CFS) =       9.50

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.43   FLOW VELOCITY(FEET/SEC.) =   1.02
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     12.00 =    1432.00 FEET.

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

```
  FLOW PROCESS FROM NODE     12.00 TO NODE     12.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   30.22
  RAINFALL INTENSITY(INCH/HR) =   1.15
  TOTAL STREAM AREA(ACRES) =    11.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.50

****************************************************************************
  FLOW PROCESS FROM NODE     20.00 TO NODE     12.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   787.00
  UPSTREAM ELEVATION(FEET) =   1523.00
  DOWNSTREAM ELEVATION(FEET) =   1519.51
  ELEVATION DIFFERENCE(FEET) =      3.49
  TC = 0.533*[(  787.00**3)/(     3.49)]**.2 =   22.668
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.279
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6679
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      2.76
  TOTAL AREA(ACRES) =      3.23   TOTAL RUNOFF(CFS) =      2.76

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE     12.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   22.67
  RAINFALL INTENSITY(INCH/HR) =   1.28
  TOTAL STREAM AREA(ACRES) =     3.23
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.76

  ** CONFLUENCE DATA **
  STREAM     RUNOFF        Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        9.50    30.22        1.146         11.30
      2        2.76    22.67        1.279          3.23

 ********************************WARNING*********************************
```

```
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

  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        9.89    22.67       1.279
      2       11.97    30.22       1.146

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      11.97   Tc(MIN.) =   30.22
  TOTAL AREA(ACRES) =       14.5
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     12.00 =    1432.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       14.5  TC(MIN.) =     30.22
  PEAK FLOW RATE(CFS)   =      11.97
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
******************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
        RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                    (RCFC&WCD)  1978 HYDROLOGY MANUAL
         (c) Copyright 1982-2016 Advanced Engineering Software (aes)
                    (Rational Tabling Version 23.0)
                Release Date: 07/01/2016  License ID 1334

                          Analysis prepared by:
```

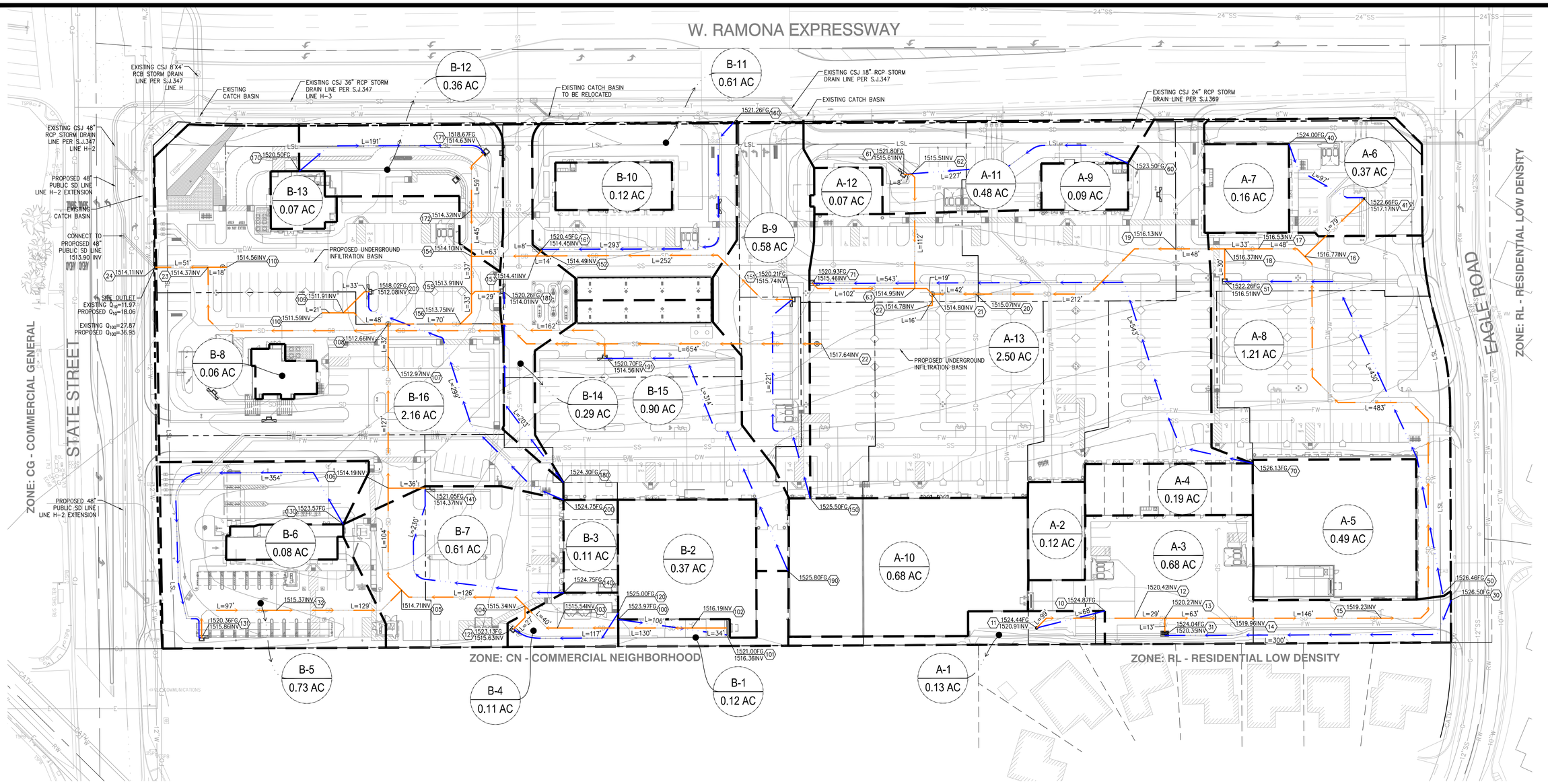
```
 ************************* DESCRIPTION OF STUDY *************************
* SP8950 SAN JACINTO                                                    *
* EXISTING ONSITE RATIONAL METHOD                                       *
* 100-YEAR STORM EVENT  PJ                                              *
 ************************************************************************

  FILE NAME: SJ100REX.DAT
  TIME/DATE OF STUDY: 08:50 07/19/2023
------------------------------------------------------------------------
  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
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  1.730
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.874
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  3.490
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.760
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.3810757
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.3820757
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.760
  SLOPE OF INTENSITY DURATION CURVE = 0.3821
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
        AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
  *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     11.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   963.00
  UPSTREAM ELEVATION(FEET) =   1528.04
  DOWNSTREAM ELEVATION(FEET) =   1521.00
  ELEVATION DIFFERENCE(FEET) =      7.04
  TC = 0.533*[(  963.00**3)/(     7.04)]**.2 =   22.236
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.572
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7674
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =     18.25
  TOTAL AREA(ACRES) =      9.25   TOTAL RUNOFF(CFS) =     18.25

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     12.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =   1521.00  DOWNSTREAM(FEET) =   1519.51
  CHANNEL LENGTH THRU SUBAREA(FEET) =   469.00   CHANNEL SLOPE =  0.0032
  CHANNEL BASE(FEET) =    0.00   "Z" FACTOR =  50.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   0.50

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

   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.385
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7586
  SOIL CLASSIFICATION IS "D"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      20.11
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.61
  AVERAGE FLOW DEPTH(FEET) =   0.50   TRAVEL TIME(MIN.) =   4.86
  Tc(MIN.) =   27.09
  SUBAREA AREA(ACRES) =     2.05       SUBAREA RUNOFF(CFS) =    3.71
```

```
  TOTAL AREA(ACRES) =       11.3         PEAK FLOW RATE(CFS) =      21.96

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


  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.50   FLOW VELOCITY(FEET/SEC.) =   1.76

  ==>FLOWDEPTH EXCEEDS MAXIMUM ALLOWABLE DEPTH

  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     12.00 =    1432.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE     12.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   27.09
  RAINFALL INTENSITY(INCH/HR) =   2.38
  TOTAL STREAM AREA(ACRES) =    11.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     21.96

****************************************************************************
  FLOW PROCESS FROM NODE     20.00 TO NODE     12.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   787.00
  UPSTREAM ELEVATION(FEET) =   1523.00
  DOWNSTREAM ELEVATION(FEET) =   1519.51
  ELEVATION DIFFERENCE(FEET) =      3.49
  TC = 0.533*[(  787.00**3)/(     3.49)]**.2 =   22.668
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.553
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7665
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      6.32
  TOTAL AREA(ACRES) =      3.23   TOTAL RUNOFF(CFS) =      6.32

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE     12.00 IS CODE =   1
----------------------------------------------------------------------------
```

```
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   22.67
  RAINFALL INTENSITY(INCH/HR) =   2.55
  TOTAL STREAM AREA(ACRES) =     3.23
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.32

  ** CONFLUENCE DATA **
  STREAM     RUNOFF        Tc       INTENSITY      AREA
  NUMBER      (CFS)      (MIN.)   (INCH/HOUR)    (ACRE)
      1       21.96    27.09        2.385         11.30
      2        6.32    22.67        2.553          3.23

 **********************************WARNING**********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ***************************************************************************

  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       24.70    22.67       2.553
      2       27.87    27.09       2.385

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      27.87   Tc(MIN.) =   27.09
  TOTAL AREA(ACRES) =       14.5
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     12.00 =    1432.00 FEET.
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       14.5  TC(MIN.) =     27.09
  PEAK FLOW RATE(CFS)   =      27.87
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

Appendix E – Proposed Onsite Hydrology Map and Rational Method



NO.	DESCRIPTION	BY	DATE
	REVISIONS		
NO.	DESCRIPTION	BY	DATE

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PROPOSED ONSITE HYDROLOGY MAP

THE MAGNET
RICH DEVELOPMENT
600 N TUSTIN, SUITE 150
SAN JACINTO, CA

DRAWN: TLP
DATE: 01/23/2024
CHECKED:
DATE:
REVISION #:
DATE:
JOB NO: SP8950

1 OF 1

Jan 23, 2024 - 11:27am by cescobedo K:\Drawings\SP\SP8950 - San Jacinto\ENG\Hydrology\SP8950_ONSITE_RR.dwg

```
******************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
        RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                    (RCFC&WCD)  1978 HYDROLOGY MANUAL
         (c) Copyright 1982-2016 Advanced Engineering Software (aes)
                    (Rational Tabling Version 23.0)
                Release Date: 07/01/2016  License ID 1334

                          Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* SP8950 SAN JACINTO                                                     *
* PROPOSED ONSITE RATIONAL METHOD                                        *
* 10-YEAR STORM EVENT  PJ                                                *
 ************************************************************************

  FILE NAME: SJ10RPR.DAT
  TIME/DATE OF STUDY: 15:16 01/10/2024
------------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  1.730
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.874
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  3.490
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.760
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.3810757
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.3820757
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =   10.00   1-HOUR INTENSITY(INCH/HOUR) =   0.883
  SLOPE OF INTENSITY DURATION CURVE = 0.3811
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
        AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
  *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     11.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    68.00
```

```
  UPSTREAM ELEVATION(FEET) =   1524.88
  DOWNSTREAM ELEVATION(FEET) =   1524.44
  ELEVATION DIFFERENCE(FEET) =      0.44
  TC = 0.303*[(   68.00**3)/(     0.44)]**.2 =    4.491
  COMPUTED TIME OF CONCENTRATION INCREASED TO 5 MIN.
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.276
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8853
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      0.26
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.26

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     12.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1520.91  DOWNSTREAM(FEET) =  1520.42
  FLOW LENGTH(FEET) =    99.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   6.0 INCH PIPE IS   3.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.21
  ESTIMATED PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.26
  PIPE TRAVEL TIME(MIN.) =   0.75    Tc(MIN.) =    5.75
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     12.00 =     167.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE     12.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.158
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8846
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    0.12   SUBAREA RUNOFF(CFS) =    0.23
  TOTAL AREA(ACRES) =       0.2   TOTAL RUNOFF(CFS) =       0.49
  TC(MIN.) =    5.75

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE     13.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1520.42  DOWNSTREAM(FEET) =  1520.27
  FLOW LENGTH(FEET) =    29.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   3.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.66
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.49
  PIPE TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =    5.93
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     13.00 =     196.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    5.93
  RAINFALL INTENSITY(INCH/HR) =   2.13
  TOTAL STREAM AREA(ACRES) =     0.25
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.49
```

```
****************************************************************************
 FLOW PROCESS FROM NODE     30.00 TO NODE     31.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS COMMERCIAL
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
 UPSTREAM ELEVATION(FEET) =   1526.42
 DOWNSTREAM ELEVATION(FEET) =   1524.04
 ELEVATION DIFFERENCE(FEET) =      2.38
 TC = 0.303*[(  300.00**3)/(     2.38)]**.2 =    7.808
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.920
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8831
 SOIL CLASSIFICATION IS "D"
 SUBAREA RUNOFF(CFS) =      1.15
 TOTAL AREA(ACRES) =      0.68   TOTAL RUNOFF(CFS) =      1.15

****************************************************************************
 FLOW PROCESS FROM NODE     31.00 TO NODE     13.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1520.35  DOWNSTREAM(FEET) =  1520.27
 FLOW LENGTH(FEET) =    13.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN   9.0 INCH PIPE IS   6.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.47
 ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.15
 PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =    7.87
 LONGEST FLOWPATH FROM NODE     30.00 TO NODE     13.00 =     313.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    7.87
 RAINFALL INTENSITY(INCH/HR) =   1.91
 TOTAL STREAM AREA(ACRES) =     0.68
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.15

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        0.49     5.93        2.133          0.25
     2        1.15     7.87        1.914          0.68

 *********************************WARNING*********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 *************************************************************************

 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        1.36     5.93       2.133
      2        1.59     7.87       1.914

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       1.59   Tc(MIN.) =    7.87
  TOTAL AREA(ACRES) =        0.9
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     13.00 =     313.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     14.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1520.27  DOWNSTREAM(FEET) =  1519.96
  FLOW LENGTH(FEET) =    63.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.51
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.59
  PIPE TRAVEL TIME(MIN.) =   0.30    Tc(MIN.) =    8.17
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     14.00 =     376.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     14.00 TO NODE     14.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.887
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8828
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    0.19   SUBAREA RUNOFF(CFS) =    0.32
  TOTAL AREA(ACRES) =        1.1   TOTAL RUNOFF(CFS) =       1.91
  TC(MIN.) =    8.17

****************************************************************************
  FLOW PROCESS FROM NODE     14.00 TO NODE     15.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1519.96  DOWNSTREAM(FEET) =  1519.23
  FLOW LENGTH(FEET) =   146.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.69
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.91
  PIPE TRAVEL TIME(MIN.) =   0.66    Tc(MIN.) =    8.83
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     15.00 =     522.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     15.00 TO NODE     15.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.832
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8824
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    0.49   SUBAREA RUNOFF(CFS) =    0.79
  TOTAL AREA(ACRES) =        1.6   TOTAL RUNOFF(CFS) =       2.70
  TC(MIN.) =    8.83

****************************************************************************
  FLOW PROCESS FROM NODE     15.00 TO NODE     16.00 IS CODE =  31
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1519.23  DOWNSTREAM(FEET) =  1516.77
  FLOW LENGTH(FEET) =   490.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.04
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.70
  PIPE TRAVEL TIME(MIN.) =   2.02    Tc(MIN.) =   10.85
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     16.00 =    1012.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 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.) =   10.85
  RAINFALL INTENSITY(INCH/HR) =   1.69
  TOTAL STREAM AREA(ACRES) =     1.61
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.70

****************************************************************************
  FLOW PROCESS FROM NODE     40.00 TO NODE     41.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    97.00
  UPSTREAM ELEVATION(FEET) =   1524.00
  DOWNSTREAM ELEVATION(FEET) =   1522.66
  ELEVATION DIFFERENCE(FEET) =      1.34
  TC = 0.303*[(   97.00**3)/(     1.34)]**.2 =    4.449
  COMPUTED TIME OF CONCENTRATION INCREASED TO 5 MIN.
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.276
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8853
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      0.75
  TOTAL AREA(ACRES) =      0.37   TOTAL RUNOFF(CFS) =      0.75

****************************************************************************
  FLOW PROCESS FROM NODE     41.00 TO NODE     16.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1517.17  DOWNSTREAM(FEET) =  1516.77
  FLOW LENGTH(FEET) =    79.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   5.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.93
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.75
  PIPE TRAVEL TIME(MIN.) =   0.45    Tc(MIN.) =    5.45
  LONGEST FLOWPATH FROM NODE     40.00 TO NODE     16.00 =     176.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
```

```
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    5.45
 RAINFALL INTENSITY(INCH/HR) =   2.20
 TOTAL STREAM AREA(ACRES) =     0.37
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.75

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        2.70    10.85        1.694          1.61
     2        0.75     5.45        2.202          0.37

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 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

 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        2.10     5.45       2.202
     2        3.28    10.85       1.694

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       3.28   Tc(MIN.) =   10.85
 TOTAL AREA(ACRES) =        2.0
 LONGEST FLOWPATH FROM NODE     30.00 TO NODE     16.00 =    1012.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     16.00 TO NODE     17.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1516.77  DOWNSTREAM(FEET) =  1516.53
 FLOW LENGTH(FEET) =    48.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  15.0 INCH PIPE IS   9.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.22
 ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       3.28
 PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =   11.04
 LONGEST FLOWPATH FROM NODE     30.00 TO NODE     17.00 =    1060.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     17.00 TO NODE     17.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.683
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8812
 SOIL CLASSIFICATION IS "D"
 SUBAREA AREA(ACRES) =    0.16   SUBAREA RUNOFF(CFS) =    0.24
 TOTAL AREA(ACRES) =        2.1   TOTAL RUNOFF(CFS) =       3.51
 TC(MIN.) =   11.04

****************************************************************************
 FLOW PROCESS FROM NODE     17.00 TO NODE     18.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1516.53  DOWNSTREAM(FEET) =  1516.37
  FLOW LENGTH(FEET) =    33.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   9.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.23
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.51
  PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =   11.17
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     18.00 =    1093.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     18.00 TO NODE     18.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.17
  RAINFALL INTENSITY(INCH/HR) =   1.68
  TOTAL STREAM AREA(ACRES) =     2.14
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.51

****************************************************************************
  FLOW PROCESS FROM NODE     50.00 TO NODE     51.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   430.00
  UPSTREAM ELEVATION(FEET) =   1526.34
  DOWNSTREAM ELEVATION(FEET) =   1522.26
  ELEVATION DIFFERENCE(FEET) =      4.08
  TC = 0.303*[(  430.00**3)/(     4.08)]**.2 =    8.700
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.843
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8825
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      1.97
  TOTAL AREA(ACRES) =      1.21   TOTAL RUNOFF(CFS) =      1.97

****************************************************************************
  FLOW PROCESS FROM NODE     51.00 TO NODE     18.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1516.51  DOWNSTREAM(FEET) =  1516.37
  FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.60
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.97
  PIPE TRAVEL TIME(MIN.) =   0.14    Tc(MIN.) =    8.84
  LONGEST FLOWPATH FROM NODE     50.00 TO NODE     18.00 =     460.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     18.00 TO NODE     18.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.84
```

```
 RAINFALL INTENSITY(INCH/HR) =   1.83
 TOTAL STREAM AREA(ACRES) =     1.21
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.97

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        3.51    11.17        1.675          2.14
     2        1.97     8.84        1.831          1.21

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 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

 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        4.75     8.84       1.831
     2        5.31    11.17       1.675

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       5.31   Tc(MIN.) =   11.17
 TOTAL AREA(ACRES) =        3.4
 LONGEST FLOWPATH FROM NODE     30.00 TO NODE     18.00 =    1093.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     18.00 TO NODE     19.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1516.37  DOWNSTREAM(FEET) =  1516.13
 FLOW LENGTH(FEET) =    48.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.76
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       5.31
 PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =   11.34
 LONGEST FLOWPATH FROM NODE     30.00 TO NODE     19.00 =    1141.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     19.00 TO NODE     19.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.666
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8810
 SOIL CLASSIFICATION IS "D"
 SUBAREA AREA(ACRES) =    0.09   SUBAREA RUNOFF(CFS) =    0.13
 TOTAL AREA(ACRES) =        3.4   TOTAL RUNOFF(CFS) =       5.44
 TC(MIN.) =   11.34

****************************************************************************
 FLOW PROCESS FROM NODE     19.00 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) =  1516.13  DOWNSTREAM(FEET) =  1515.07
 FLOW LENGTH(FEET) =   212.00   MANNING'S N =  0.012
```

```
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.79
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.44
  PIPE TRAVEL TIME(MIN.) =   0.74    Tc(MIN.) =   12.07
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     20.00 =    1353.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     20.00 TO NODE     20.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.626
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8807
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    0.68   SUBAREA RUNOFF(CFS) =    0.97
  TOTAL AREA(ACRES) =        4.1   TOTAL RUNOFF(CFS) =       6.42
  TC(MIN.) =   12.07

****************************************************************************
  FLOW PROCESS FROM NODE     20.00 TO NODE     21.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1515.07  DOWNSTREAM(FEET) =  1514.80
  FLOW LENGTH(FEET) =    42.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.48
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.42
  PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =   12.20
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     21.00 =    1395.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     21.00 TO NODE     21.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     60.00 TO NODE     61.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   227.00
  UPSTREAM ELEVATION(FEET) =   1523.50
  DOWNSTREAM ELEVATION(FEET) =   1521.80
  ELEVATION DIFFERENCE(FEET) =      1.70
  TC = 0.303*[(  227.00**3)/(     1.70)]**.2 =    7.065
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.995
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8836
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      0.85
  TOTAL AREA(ACRES) =      0.48   TOTAL RUNOFF(CFS) =      0.85

****************************************************************************
  FLOW PROCESS FROM NODE     61.00 TO NODE     62.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =  1515.61  DOWNSTREAM(FEET) =  1515.51
  FLOW LENGTH(FEET) =     8.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   4.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.27
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.85
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =    7.10
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     62.00 =     235.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     62.00 TO NODE     62.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.991
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8836
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    0.07   SUBAREA RUNOFF(CFS) =    0.12
  TOTAL AREA(ACRES) =        0.6   TOTAL RUNOFF(CFS) =       0.97
  TC(MIN.) =    7.10

****************************************************************************
  FLOW PROCESS FROM NODE     62.00 TO NODE     63.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1515.51  DOWNSTREAM(FEET) =  1514.95
  FLOW LENGTH(FEET) =   112.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   6.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.10
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.97
  PIPE TRAVEL TIME(MIN.) =   0.60    Tc(MIN.) =    7.70
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     63.00 =     347.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     63.00 TO NODE     63.00 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.) =    7.70
  RAINFALL INTENSITY(INCH/HR) =   1.93
  TOTAL STREAM AREA(ACRES) =     0.55
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.97

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     71.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   543.00
  UPSTREAM ELEVATION(FEET) =   1526.13
  DOWNSTREAM ELEVATION(FEET) =   1520.93
  ELEVATION DIFFERENCE(FEET) =      5.20
  TC = 0.303*[(  543.00**3)/(     5.20)]**.2 =    9.534
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.779
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8820
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      3.92
```

```
 TOTAL AREA(ACRES) =      2.50   TOTAL RUNOFF(CFS) =      3.92

****************************************************************************
 FLOW PROCESS FROM NODE     71.00 TO NODE     63.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1515.46  DOWNSTREAM(FEET) =  1514.95
 FLOW LENGTH(FEET) =   102.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  15.0 INCH PIPE IS  10.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.38
 ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       3.92
 PIPE TRAVEL TIME(MIN.) =   0.39    Tc(MIN.) =    9.92
 LONGEST FLOWPATH FROM NODE     70.00 TO NODE     63.00 =     645.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     63.00 TO NODE     63.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.92
 RAINFALL INTENSITY(INCH/HR) =   1.75
 TOTAL STREAM AREA(ACRES) =     2.50
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.92

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        0.97     7.70        1.930          0.55
     2        3.92     9.92        1.753          2.50

 **********************************WARNING***********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ****************************************************************************

 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        4.01     7.70       1.930
     2        4.80     9.92       1.753

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       4.80   Tc(MIN.) =    9.92
 TOTAL AREA(ACRES) =        3.0
 LONGEST FLOWPATH FROM NODE     70.00 TO NODE     63.00 =     645.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     63.00 TO NODE     21.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1514.95  DOWNSTREAM(FEET) =  1514.80
 FLOW LENGTH(FEET) =    19.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  15.0 INCH PIPE IS  10.1 INCHES
```

```
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.47
 ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       4.80
 PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =    9.98
 LONGEST FLOWPATH FROM NODE     70.00 TO NODE     21.00 =     664.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     21.00 TO NODE     21.00 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        4.80      9.98        1.749        3.05
 LONGEST FLOWPATH FROM NODE     70.00 TO NODE     21.00 =     664.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc       INTENSITY     AREA
 NUMBER      (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
     1        6.42     12.20        1.620        4.12
 LONGEST FLOWPATH FROM NODE     30.00 TO NODE     21.00 =    1395.00 FEET.

 **********************************WARNING**********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ***************************************************************************

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc       INTENSITY
 NUMBER     (CFS)      (MIN.)    (INCH/HOUR)
     1      10.05       9.98        1.749
     2      10.87      12.20        1.620

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      10.87   Tc(MIN.) =   12.20
 TOTAL AREA(ACRES) =        7.2

****************************************************************************
 FLOW PROCESS FROM NODE     21.00 TO NODE     21.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE     21.00 TO NODE     22.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1514.80  DOWNSTREAM(FEET) =  1514.78
 FLOW LENGTH(FEET) =    16.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  20.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.31
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      10.87
 PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =   12.28
 LONGEST FLOWPATH FROM NODE     30.00 TO NODE     22.00 =    1411.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     22.00 TO NODE     23.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1517.64  DOWNSTREAM(FEET) =  1514.37
  FLOW LENGTH(FEET) =   654.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.57
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.87
  PIPE TRAVEL TIME(MIN.) =   1.96    Tc(MIN.) =   14.24
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     23.00 =    2065.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     23.00 TO NODE     23.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   106.00
  UPSTREAM ELEVATION(FEET) =   1523.97
  DOWNSTREAM ELEVATION(FEET) =   1521.00
  ELEVATION DIFFERENCE(FEET) =      2.97
  TC = 0.303*[(  106.00**3)/(     2.97)]**.2 =    4.001
  COMPUTED TIME OF CONCENTRATION INCREASED TO 5 MIN.
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.276
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8853
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      0.24
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.24

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1516.36  DOWNSTREAM(FEET) =  1516.19
  FLOW LENGTH(FEET) =    34.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   6.0 INCH PIPE IS   3.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.20
  ESTIMATED PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.24
  PIPE TRAVEL TIME(MIN.) =   0.26    Tc(MIN.) =    5.26
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =     140.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.232
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8851
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    0.37   SUBAREA RUNOFF(CFS) =    0.73
  TOTAL AREA(ACRES) =        0.5   TOTAL RUNOFF(CFS) =       0.97
  TC(MIN.) =    5.26

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

```
 FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1516.19  DOWNSTREAM(FEET) =  1515.54
 FLOW LENGTH(FEET) =   130.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN   9.0 INCH PIPE IS   6.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.09
 ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.97
 PIPE TRAVEL TIME(MIN.) =   0.70    Tc(MIN.) =    5.96
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =     270.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.128
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8845
 SOIL CLASSIFICATION IS "D"
 SUBAREA AREA(ACRES) =    0.11   SUBAREA RUNOFF(CFS) =    0.21
 TOTAL AREA(ACRES) =        0.6   TOTAL RUNOFF(CFS) =       1.18
 TC(MIN.) =    5.96

****************************************************************************
 FLOW PROCESS FROM NODE    103.00 TO NODE    104.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1515.54  DOWNSTREAM(FEET) =  1515.34
 FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN   9.0 INCH PIPE IS   7.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.17
 ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.18
 PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =    6.17
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    104.00 =     310.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 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.) =    6.17
 RAINFALL INTENSITY(INCH/HR) =   2.10
 TOTAL STREAM AREA(ACRES) =     0.60
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.18

****************************************************************************
 FLOW PROCESS FROM NODE    120.00 TO NODE    121.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS COMMERCIAL
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   117.00
 UPSTREAM ELEVATION(FEET) =   1525.00
 DOWNSTREAM ELEVATION(FEET) =   1523.13
 ELEVATION DIFFERENCE(FEET) =      1.87
```

```
 TC = 0.303*[(  117.00**3)/(     1.87)]**.2 =    4.657
 COMPUTED TIME OF CONCENTRATION INCREASED TO 5 MIN.
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.276
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8853
 SOIL CLASSIFICATION IS "D"
 SUBAREA RUNOFF(CFS) =      0.22
 TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.22

****************************************************************************
 FLOW PROCESS FROM NODE    121.00 TO NODE    104.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1515.63  DOWNSTREAM(FEET) =  1515.34
 FLOW LENGTH(FEET) =    27.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN   6.0 INCH PIPE IS   2.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   2.89
 ESTIMATED PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.22
 PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =    5.16
 LONGEST FLOWPATH FROM NODE    120.00 TO NODE    104.00 =     144.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    5.16
 RAINFALL INTENSITY(INCH/HR) =   2.25
 TOTAL STREAM AREA(ACRES) =     0.11
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.22

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        1.18     6.17        2.100         0.60
     2        0.22     5.16        2.249         0.11

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 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
****************************************************************************

 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        1.21     5.16       2.249
     2        1.39     6.17       2.100

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       1.39   Tc(MIN.) =    6.17
 TOTAL AREA(ACRES) =        0.7
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    104.00 =     310.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    104.00 TO NODE    105.00 IS CODE =  31
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1515.34  DOWNSTREAM(FEET) =  1514.71
  FLOW LENGTH(FEET) =   126.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.42
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.39
  PIPE TRAVEL TIME(MIN.) =   0.61    Tc(MIN.) =    6.78
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    105.00 =     436.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 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.) =    6.78
  RAINFALL INTENSITY(INCH/HR) =   2.03
  TOTAL STREAM AREA(ACRES) =     0.71
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.39

****************************************************************************
  FLOW PROCESS FROM NODE    130.00 TO NODE    131.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   354.00
  UPSTREAM ELEVATION(FEET) =   1523.57
  DOWNSTREAM ELEVATION(FEET) =   1520.36
  ELEVATION DIFFERENCE(FEET) =      3.21
  TC = 0.303*[(  354.00**3)/(     3.21)]**.2 =    8.122
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.891
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8829
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      1.22
  TOTAL AREA(ACRES) =      0.73   TOTAL RUNOFF(CFS) =      1.22

****************************************************************************
  FLOW PROCESS FROM NODE    131.00 TO NODE    132.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1515.86  DOWNSTREAM(FEET) =  1515.37
  FLOW LENGTH(FEET) =    97.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   7.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.20
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.22
  PIPE TRAVEL TIME(MIN.) =   0.51    Tc(MIN.) =    8.63
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    132.00 =     451.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    132.00 TO NODE    132.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.848
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8826
```

```
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    0.08   SUBAREA RUNOFF(CFS) =    0.13
  TOTAL AREA(ACRES) =        0.8   TOTAL RUNOFF(CFS) =       1.35
  TC(MIN.) =    8.63

****************************************************************************
  FLOW PROCESS FROM NODE    132.00 TO NODE    105.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1515.37  DOWNSTREAM(FEET) =  1514.71
  FLOW LENGTH(FEET) =   129.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.42
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.35
  PIPE TRAVEL TIME(MIN.) =   0.63    Tc(MIN.) =    9.26
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    105.00 =     580.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.26
  RAINFALL INTENSITY(INCH/HR) =   1.80
  TOTAL STREAM AREA(ACRES) =     0.81
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.35

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        1.39     6.78        2.026          0.71
      2        1.35     9.26        1.799          0.81

 **********************************WARNING**********************************
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  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ***************************************************************************

  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        2.38     6.78       2.026
      2        2.58     9.26       1.799

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       2.38   Tc(MIN.) =    6.78
  TOTAL AREA(ACRES) =        1.5
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    105.00 =     580.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    106.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =  1514.71  DOWNSTREAM(FEET) =  1514.19
  FLOW LENGTH(FEET) =   104.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   8.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.83
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.38
  PIPE TRAVEL TIME(MIN.) =   0.45    Tc(MIN.) =    7.24
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    106.00 =     684.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 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.) =    7.24
  RAINFALL INTENSITY(INCH/HR) =   1.98
  TOTAL STREAM AREA(ACRES) =     1.52
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.38

****************************************************************************
  FLOW PROCESS FROM NODE    140.00 TO NODE    141.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   230.00
  UPSTREAM ELEVATION(FEET) =   1524.75
  DOWNSTREAM ELEVATION(FEET) =   1521.05
  ELEVATION DIFFERENCE(FEET) =      3.70
  TC = 0.303*[(  230.00**3)/(     3.70)]**.2 =    6.095
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.110
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8843
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      1.14
  TOTAL AREA(ACRES) =      0.61   TOTAL RUNOFF(CFS) =      1.14

****************************************************************************
  FLOW PROCESS FROM NODE    141.00 TO NODE    106.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1514.37  DOWNSTREAM(FEET) =  1514.19
  FLOW LENGTH(FEET) =    36.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   6.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.18
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.14
  PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =    6.28
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    106.00 =     266.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.28
  RAINFALL INTENSITY(INCH/HR) =   2.09
```

```
 TOTAL STREAM AREA(ACRES) =     0.61
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.14

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        2.38     7.24        1.977          1.52
     2        1.14     6.28        2.086          0.61

 ********************************WARNING*********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

 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        3.20     6.28       2.086
     2        3.45     7.24       1.977

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       3.45   Tc(MIN.) =    7.24
 TOTAL AREA(ACRES) =        2.1
 LONGEST FLOWPATH FROM NODE    130.00 TO NODE    106.00 =     684.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    106.00 TO NODE    107.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1514.19  DOWNSTREAM(FEET) =  1512.97
 FLOW LENGTH(FEET) =   127.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   9.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.34
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       3.45
 PIPE TRAVEL TIME(MIN.) =   0.40    Tc(MIN.) =    7.63
 LONGEST FLOWPATH FROM NODE    130.00 TO NODE    107.00 =     811.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    107.00 TO NODE    107.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.937
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8832
 SOIL CLASSIFICATION IS "D"
 SUBAREA AREA(ACRES) =    0.06   SUBAREA RUNOFF(CFS) =    0.10
 TOTAL AREA(ACRES) =        2.2   TOTAL RUNOFF(CFS) =       3.56
 TC(MIN.) =    7.63

****************************************************************************
 FLOW PROCESS FROM NODE    107.00 TO NODE    108.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1512.97  DOWNSTREAM(FEET) =  1512.66
 FLOW LENGTH(FEET) =    32.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   9.4 INCHES
```

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.37
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.56
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =    7.73
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    108.00 =     843.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    108.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    150.00 TO NODE    151.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   221.00
  UPSTREAM ELEVATION(FEET) =   1525.50
  DOWNSTREAM ELEVATION(FEET) =   1520.21
  ELEVATION DIFFERENCE(FEET) =      5.29
  TC = 0.303*[(  221.00**3)/(     5.29)]**.2 =    5.540
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.188
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8848
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      1.12
  TOTAL AREA(ACRES) =      0.58   TOTAL RUNOFF(CFS) =      1.12

****************************************************************************
  FLOW PROCESS FROM NODE    151.00 TO NODE    152.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1515.74  DOWNSTREAM(FEET) =  1514.49
  FLOW LENGTH(FEET) =   252.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   6.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.16
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.12
  PIPE TRAVEL TIME(MIN.) =   1.33    Tc(MIN.) =    6.87
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    152.00 =     473.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    152.00 TO NODE    152.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.016
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8837
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    0.12   SUBAREA RUNOFF(CFS) =    0.21
  TOTAL AREA(ACRES) =        0.7   TOTAL RUNOFF(CFS) =       1.34
  TC(MIN.) =    6.87

****************************************************************************
  FLOW PROCESS FROM NODE    152.00 TO NODE    153.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1514.49  DOWNSTREAM(FEET) =  1514.41
```

```
  FLOW LENGTH(FEET) =    14.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   5.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.57
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.34
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =    6.94
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    153.00 =     487.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    153.00 TO NODE    153.00 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.) =    6.94
  RAINFALL INTENSITY(INCH/HR) =   2.01
  TOTAL STREAM AREA(ACRES) =     0.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.34

****************************************************************************
  FLOW PROCESS FROM NODE    160.00 TO NODE    161.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   293.00
  UPSTREAM ELEVATION(FEET) =   1521.25
  DOWNSTREAM ELEVATION(FEET) =   1520.45
  ELEVATION DIFFERENCE(FEET) =      0.80
  TC = 0.303*[(  293.00**3)/(     0.80)]**.2 =    9.574
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.777
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8820
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      0.96
  TOTAL AREA(ACRES) =      0.61   TOTAL RUNOFF(CFS) =      0.96

****************************************************************************
  FLOW PROCESS FROM NODE    161.00 TO NODE    153.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1514.45  DOWNSTREAM(FEET) =  1514.41
  FLOW LENGTH(FEET) =     8.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   6.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.08
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.96
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =    9.62
  LONGEST FLOWPATH FROM NODE    160.00 TO NODE    153.00 =     301.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    153.00 TO NODE    153.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.62
  RAINFALL INTENSITY(INCH/HR) =   1.77
  TOTAL STREAM AREA(ACRES) =     0.61
```

```
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.96

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        1.34     6.94        2.009          0.70
     2        0.96     9.62        1.773          0.61

 ********************************WARNING*********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

 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        2.03     6.94       2.009
     2        2.14     9.62       1.773

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       2.03   Tc(MIN.) =    6.94
 TOTAL AREA(ACRES) =        1.3
 LONGEST FLOWPATH FROM NODE    150.00 TO NODE    153.00 =     487.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    153.00 TO NODE    154.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1514.41  DOWNSTREAM(FEET) =  1514.10
 FLOW LENGTH(FEET) =    63.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.70
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       2.03
 PIPE TRAVEL TIME(MIN.) =   0.28    Tc(MIN.) =    7.22
 LONGEST FLOWPATH FROM NODE    150.00 TO NODE    154.00 =     550.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    154.00 TO NODE    154.00 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.) =    7.22
 RAINFALL INTENSITY(INCH/HR) =   1.98
 TOTAL STREAM AREA(ACRES) =     1.31
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.03

****************************************************************************
 FLOW PROCESS FROM NODE    170.00 TO NODE    171.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   191.00
 UPSTREAM ELEVATION(FEET) =   1520.50
```

```
  DOWNSTREAM ELEVATION(FEET) =   1518.67
  ELEVATION DIFFERENCE(FEET) =      1.83
  TC = 0.303*[(  191.00**3)/(     1.83)]**.2 =    6.277
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.087
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8842
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      0.66
  TOTAL AREA(ACRES) =      0.36   TOTAL RUNOFF(CFS) =      0.66

****************************************************************************
  FLOW PROCESS FROM NODE    171.00 TO NODE    172.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1514.63  DOWNSTREAM(FEET) =  1514.32
  FLOW LENGTH(FEET) =    59.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   4.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.90
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.66
  PIPE TRAVEL TIME(MIN.) =   0.34    Tc(MIN.) =    6.62
  LONGEST FLOWPATH FROM NODE    170.00 TO NODE    172.00 =     250.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    172.00 TO NODE    172.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.045
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8839
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    0.07   SUBAREA RUNOFF(CFS) =    0.13
  TOTAL AREA(ACRES) =        0.4   TOTAL RUNOFF(CFS) =       0.79
  TC(MIN.) =    6.62

****************************************************************************
  FLOW PROCESS FROM NODE    172.00 TO NODE    154.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1514.32  DOWNSTREAM(FEET) =  1514.10
  FLOW LENGTH(FEET) =    45.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   5.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.94
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.79
  PIPE TRAVEL TIME(MIN.) =   0.25    Tc(MIN.) =    6.87
  LONGEST FLOWPATH FROM NODE    170.00 TO NODE    154.00 =     295.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    154.00 TO NODE    154.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.87
  RAINFALL INTENSITY(INCH/HR) =   2.02
  TOTAL STREAM AREA(ACRES) =     0.43
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.79

  ** CONFLUENCE DATA **
```

```
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        2.03     7.22        1.978          1.31
     2        0.79     6.87        2.016          0.43

 ********************************WARNING*********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

  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        2.72     6.87       2.016
      2        2.80     7.22       1.978

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       2.80   Tc(MIN.) =    7.22
  TOTAL AREA(ACRES) =        1.7
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    154.00 =     550.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    154.00 TO NODE    155.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1514.10  DOWNSTREAM(FEET) =  1513.91
  FLOW LENGTH(FEET) =    37.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.12
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.80
  PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =    7.37
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    155.00 =     587.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    155.00 TO NODE    155.00 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.) =    7.37
  RAINFALL INTENSITY(INCH/HR) =   1.96
  TOTAL STREAM AREA(ACRES) =     1.74
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.80

****************************************************************************
  FLOW PROCESS FROM NODE    180.00 TO NODE    181.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   203.00
  UPSTREAM ELEVATION(FEET) =   1524.30
  DOWNSTREAM ELEVATION(FEET) =   1520.26
  ELEVATION DIFFERENCE(FEET) =      4.04
  TC = 0.303*[(  203.00**3)/(     4.04)]**.2 =    5.557
```

```
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.186
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8848
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      0.56
  TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      0.56

****************************************************************************
  FLOW PROCESS FROM NODE    181.00 TO NODE    155.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1514.01  DOWNSTREAM(FEET) =  1513.91
  FLOW LENGTH(FEET) =    29.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   4.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.37
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.56
  PIPE TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =    5.76
  LONGEST FLOWPATH FROM NODE    180.00 TO NODE    155.00 =     232.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    155.00 TO NODE    155.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    5.76
  RAINFALL INTENSITY(INCH/HR) =   2.16
  TOTAL STREAM AREA(ACRES) =     0.29
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.56

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        2.80     7.37        1.963          1.74
      2        0.56     5.76        2.156          0.29

 **********************************WARNING**********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ***************************************************************************

  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        2.75     5.76       2.156
      2        3.31     7.37       1.963

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       3.31   Tc(MIN.) =    7.37
  TOTAL AREA(ACRES) =        2.0
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    155.00 =     587.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    155.00 TO NODE    156.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1513.91  DOWNSTREAM(FEET) =  1513.75
  FLOW LENGTH(FEET) =    33.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   9.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.18
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.31
  PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =    7.50
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    156.00 =     620.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    156.00 TO NODE    156.00 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.) =    7.50
  RAINFALL INTENSITY(INCH/HR) =   1.95
  TOTAL STREAM AREA(ACRES) =     2.03
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.31

****************************************************************************
  FLOW PROCESS FROM NODE    190.00 TO NODE    191.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   314.00
  UPSTREAM ELEVATION(FEET) =   1525.80
  DOWNSTREAM ELEVATION(FEET) =   1520.70
  ELEVATION DIFFERENCE(FEET) =      5.10
  TC = 0.303*[(  314.00**3)/(     5.10)]**.2 =    6.890
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.014
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8837
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      1.60
  TOTAL AREA(ACRES) =      0.90   TOTAL RUNOFF(CFS) =      1.60

****************************************************************************
  FLOW PROCESS FROM NODE    191.00 TO NODE    156.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1514.56  DOWNSTREAM(FEET) =  1513.75
  FLOW LENGTH(FEET) =   162.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.55
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.60
  PIPE TRAVEL TIME(MIN.) =   0.76    Tc(MIN.) =    7.65
  LONGEST FLOWPATH FROM NODE    190.00 TO NODE    156.00 =     476.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    156.00 TO NODE    156.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.65
```

```
 RAINFALL INTENSITY(INCH/HR) =   1.93
 TOTAL STREAM AREA(ACRES) =     0.90
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.60

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        3.31     7.50        1.950          2.03
     2        1.60     7.65        1.935          0.90

 ********************************WARNING*********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

 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        4.88     7.50       1.950
     2        4.89     7.65       1.935

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       4.88   Tc(MIN.) =    7.50
 TOTAL AREA(ACRES) =        2.9
 LONGEST FLOWPATH FROM NODE    150.00 TO NODE    156.00 =     620.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    156.00 TO NODE    108.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1513.75  DOWNSTREAM(FEET) =  1512.66
 FLOW LENGTH(FEET) =    70.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.17
 ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       4.88
 PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =    7.66
 LONGEST FLOWPATH FROM NODE    150.00 TO NODE    108.00 =     690.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    108.00 TO NODE    108.00 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        4.88     7.66       1.934        2.93
 LONGEST FLOWPATH FROM NODE    150.00 TO NODE    108.00 =     690.00 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
     1        3.56     7.73       1.927        2.19
 LONGEST FLOWPATH FROM NODE    130.00 TO NODE    108.00 =     843.00 FEET.

 ********************************WARNING*********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
```

```
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ****************************************************************************

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1       8.41       7.66        1.934
      2       8.42       7.73        1.927

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       8.41   Tc(MIN.) =    7.66
  TOTAL AREA(ACRES) =        5.1

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    108.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    109.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1512.66  DOWNSTREAM(FEET) =  1511.91
  FLOW LENGTH(FEET) =    48.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS  12.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.92
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.41
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =    7.77
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    109.00 =     891.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.77
  RAINFALL INTENSITY(INCH/HR) =   1.92
  TOTAL STREAM AREA(ACRES) =     5.12
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.41

****************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    201.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   317.00
  UPSTREAM ELEVATION(FEET) =   1524.74
  DOWNSTREAM ELEVATION(FEET) =   1517.89
  ELEVATION DIFFERENCE(FEET) =      6.85
  TC = 0.303*[(  317.00**3)/(     6.85)]**.2 =    6.533
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.055
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8840
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      3.89
  TOTAL AREA(ACRES) =      2.14   TOTAL RUNOFF(CFS) =      3.89
```

```
****************************************************************************
 FLOW PROCESS FROM NODE    201.00 TO NODE    109.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1512.08  DOWNSTREAM(FEET) =  1511.91
 FLOW LENGTH(FEET) =    33.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  15.0 INCH PIPE IS  10.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.43
 ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       3.89
 PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =    6.66
 LONGEST FLOWPATH FROM NODE    200.00 TO NODE    109.00 =     350.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    6.66
 RAINFALL INTENSITY(INCH/HR) =   2.04
 TOTAL STREAM AREA(ACRES) =     2.14
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.89

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        8.41     7.77        1.924          5.12
     2        3.89     6.66        2.040          2.14

 **********************************WARNING***********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ****************************************************************************

 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       11.10     6.66       2.040
     2       12.08     7.77       1.924

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      12.08   Tc(MIN.) =    7.77
 TOTAL AREA(ACRES) =        7.3
 LONGEST FLOWPATH FROM NODE    130.00 TO NODE    109.00 =     891.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    109.00 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) =  1511.91  DOWNSTREAM(FEET) =  1511.59
 FLOW LENGTH(FEET) =    21.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.74
```

```
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      12.08
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =    7.81
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    110.00 =     912.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE     23.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1514.56  DOWNSTREAM(FEET) =  1514.37
  FLOW LENGTH(FEET) =    18.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.73
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      12.08
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =    7.84
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE     23.00 =     930.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     23.00 TO NODE     23.00 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       12.08     7.84       1.917        7.26
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE     23.00 =     930.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
      1       10.87    14.24       1.527        7.17
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     23.00 =    2065.00 FEET.

 ****************************WARNING*********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ********************************************************************

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      18.06       7.84       1.917
      2      20.49      14.24       1.527

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      18.06   Tc(MIN.) =    7.84
  TOTAL AREA(ACRES) =       14.4

****************************************************************************
  FLOW PROCESS FROM NODE     23.00 TO NODE     24.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1514.37  DOWNSTREAM(FEET) =  1514.11
  FLOW LENGTH(FEET) =    51.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.48
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
```

```
  PIPE-FLOW(CFS) =      18.06
  PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =     7.98
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     24.00 =    2116.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       14.4  TC(MIN.) =      7.98
  PEAK FLOW RATE(CFS)   =      18.06
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
******************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
        RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                    (RCFC&WCD)  1978 HYDROLOGY MANUAL
         (c) Copyright 1982-2016 Advanced Engineering Software (aes)
                    (Rational Tabling Version 23.0)
                Release Date: 07/01/2016  License ID 1334

                          Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* SP8950 SAN JACINTO                                                    *
* PROPOSED ONSITE RATIONAL METHOD                                       *
* 100-YR STORM EVEN  PJ                                                 *
 ************************************************************************

  FILE NAME: SJ100RPR.DAT
  TIME/DATE OF STUDY: 15:25 01/10/2024
------------------------------------------------------------------------------
  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
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  1.730
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.874
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  3.490
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.760
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.3810757
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.3820757
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.760
  SLOPE OF INTENSITY DURATION CURVE = 0.3821
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
        AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
  *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     11.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    68.00
```

```
  UPSTREAM ELEVATION(FEET) =   1524.88
  DOWNSTREAM ELEVATION(FEET) =   1524.44
  ELEVATION DIFFERENCE(FEET) =      0.44
  TC = 0.303*[(   68.00**3)/(     0.44)]**.2 =    4.491
  COMPUTED TIME OF CONCENTRATION INCREASED TO 5 MIN.
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.548
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8920
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      0.53
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.53

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     12.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1520.91  DOWNSTREAM(FEET) =  1520.42
  FLOW LENGTH(FEET) =    99.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   4.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.68
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.53
  PIPE TRAVEL TIME(MIN.) =   0.62    Tc(MIN.) =    5.62
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     12.00 =     167.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE     12.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.351
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8917
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    0.12   SUBAREA RUNOFF(CFS) =    0.47
  TOTAL AREA(ACRES) =       0.2   TOTAL RUNOFF(CFS) =       0.99
  TC(MIN.) =    5.62

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE     13.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1520.42  DOWNSTREAM(FEET) =  1520.27
  FLOW LENGTH(FEET) =    29.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   6.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.15
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.99
  PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =    5.77
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     13.00 =     196.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    5.77
  RAINFALL INTENSITY(INCH/HR) =   4.31
  TOTAL STREAM AREA(ACRES) =     0.25
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.99
```

```
****************************************************************************
 FLOW PROCESS FROM NODE     30.00 TO NODE     31.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS COMMERCIAL
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   300.00
 UPSTREAM ELEVATION(FEET) =   1526.42
 DOWNSTREAM ELEVATION(FEET) =   1524.04
 ELEVATION DIFFERENCE(FEET) =      2.38
 TC = 0.303*[(  300.00**3)/(     2.38)]**.2 =    7.808
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.836
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8907
 SOIL CLASSIFICATION IS "D"
 SUBAREA RUNOFF(CFS) =      2.32
 TOTAL AREA(ACRES) =      0.68   TOTAL RUNOFF(CFS) =      2.32

****************************************************************************
 FLOW PROCESS FROM NODE     31.00 TO NODE     13.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1520.35  DOWNSTREAM(FEET) =  1520.27
 FLOW LENGTH(FEET) =    13.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   8.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.16
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       2.32
 PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    7.86
 LONGEST FLOWPATH FROM NODE     30.00 TO NODE     13.00 =     313.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    7.86
 RAINFALL INTENSITY(INCH/HR) =   3.83
 TOTAL STREAM AREA(ACRES) =     0.68
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.32

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        0.99     5.77        4.306         0.25
     2        2.32     7.86        3.826         0.68

 *********************************WARNING*********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 *************************************************************************

 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        2.70     5.77       4.306
      2        3.21     7.86       3.826

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       3.21   Tc(MIN.) =    7.86
  TOTAL AREA(ACRES) =        0.9
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     13.00 =     313.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     14.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1520.27  DOWNSTREAM(FEET) =  1519.96
  FLOW LENGTH(FEET) =    63.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   9.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.17
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.21
  PIPE TRAVEL TIME(MIN.) =   0.25    Tc(MIN.) =    8.11
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     14.00 =     376.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     14.00 TO NODE     14.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.781
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8905
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    0.19   SUBAREA RUNOFF(CFS) =    0.64
  TOTAL AREA(ACRES) =        1.1   TOTAL RUNOFF(CFS) =       3.85
  TC(MIN.) =    8.11

****************************************************************************
  FLOW PROCESS FROM NODE     14.00 TO NODE     15.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1519.96  DOWNSTREAM(FEET) =  1519.23
  FLOW LENGTH(FEET) =   146.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS  10.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.36
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.85
  PIPE TRAVEL TIME(MIN.) =   0.56    Tc(MIN.) =    8.67
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     15.00 =     522.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     15.00 TO NODE     15.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.686
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8903
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    0.49   SUBAREA RUNOFF(CFS) =    1.61
  TOTAL AREA(ACRES) =        1.6   TOTAL RUNOFF(CFS) =       5.45
  TC(MIN.) =    8.67

****************************************************************************
  FLOW PROCESS FROM NODE     15.00 TO NODE     16.00 IS CODE =  31
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1519.23  DOWNSTREAM(FEET) =  1516.77
  FLOW LENGTH(FEET) =   490.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.80
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.45
  PIPE TRAVEL TIME(MIN.) =   1.70    Tc(MIN.) =   10.37
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     16.00 =    1012.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 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.) =   10.37
  RAINFALL INTENSITY(INCH/HR) =   3.44
  TOTAL STREAM AREA(ACRES) =     1.61
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.45

****************************************************************************
  FLOW PROCESS FROM NODE     40.00 TO NODE     41.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    97.00
  UPSTREAM ELEVATION(FEET) =   1524.00
  DOWNSTREAM ELEVATION(FEET) =   1522.66
  ELEVATION DIFFERENCE(FEET) =      1.34
  TC = 0.303*[(   97.00**3)/(     1.34)]**.2 =    4.449
  COMPUTED TIME OF CONCENTRATION INCREASED TO 5 MIN.
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.548
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8920
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      1.50
  TOTAL AREA(ACRES) =      0.37   TOTAL RUNOFF(CFS) =      1.50

****************************************************************************
  FLOW PROCESS FROM NODE     41.00 TO NODE     16.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1517.17  DOWNSTREAM(FEET) =  1516.77
  FLOW LENGTH(FEET) =    79.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.51
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.50
  PIPE TRAVEL TIME(MIN.) =   0.38    Tc(MIN.) =    5.38
  LONGEST FLOWPATH FROM NODE     40.00 TO NODE     16.00 =     176.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
```

```
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    5.38
 RAINFALL INTENSITY(INCH/HR) =   4.42
 TOTAL STREAM AREA(ACRES) =     0.37
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.50

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        5.45    10.37        3.442          1.61
     2        1.50     5.38        4.424          0.37

 ***********************************WARNING***********************************
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 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 *****************************************************************************

 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        4.33     5.38       4.424
     2        6.62    10.37       3.442

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       6.62   Tc(MIN.) =   10.37
 TOTAL AREA(ACRES) =        2.0
 LONGEST FLOWPATH FROM NODE     30.00 TO NODE     16.00 =    1012.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     16.00 TO NODE     17.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1516.77  DOWNSTREAM(FEET) =  1516.53
 FLOW LENGTH(FEET) =    48.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.98
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       6.62
 PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =   10.53
 LONGEST FLOWPATH FROM NODE     30.00 TO NODE     17.00 =    1060.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     17.00 TO NODE     17.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.422
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8897
 SOIL CLASSIFICATION IS "D"
 SUBAREA AREA(ACRES) =    0.16   SUBAREA RUNOFF(CFS) =    0.49
 TOTAL AREA(ACRES) =        2.1   TOTAL RUNOFF(CFS) =       7.11
 TC(MIN.) =   10.53

****************************************************************************
 FLOW PROCESS FROM NODE     17.00 TO NODE     18.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1516.53  DOWNSTREAM(FEET) =  1516.37
  FLOW LENGTH(FEET) =    33.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.96
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.11
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =   10.64
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     18.00 =    1093.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     18.00 TO NODE     18.00 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.) =   10.64
  RAINFALL INTENSITY(INCH/HR) =   3.41
  TOTAL STREAM AREA(ACRES) =     2.14
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.11

****************************************************************************
  FLOW PROCESS FROM NODE     50.00 TO NODE     51.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   430.00
  UPSTREAM ELEVATION(FEET) =   1526.34
  DOWNSTREAM ELEVATION(FEET) =   1522.26
  ELEVATION DIFFERENCE(FEET) =      4.08
  TC = 0.303*[(  430.00**3)/(     4.08)]**.2 =    8.700
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.681
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8903
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      3.97
  TOTAL AREA(ACRES) =      1.21   TOTAL RUNOFF(CFS) =      3.97

****************************************************************************
  FLOW PROCESS FROM NODE     51.00 TO NODE     18.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1516.51  DOWNSTREAM(FEET) =  1516.37
  FLOW LENGTH(FEET) =    30.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS  10.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.26
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.97
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =    8.82
  LONGEST FLOWPATH FROM NODE     50.00 TO NODE     18.00 =     460.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     18.00 TO NODE     18.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==========================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.82
```

```
 RAINFALL INTENSITY(INCH/HR) =   3.66
 TOTAL STREAM AREA(ACRES) =     1.21
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.97

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        7.11    10.64        3.408          2.14
     2        3.97     8.82        3.662          1.21

 ********************************WARNING*********************************
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 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

 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        9.85     8.82       3.662
     2       10.80    10.64       3.408

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      10.80   Tc(MIN.) =   10.64
 TOTAL AREA(ACRES) =        3.4
 LONGEST FLOWPATH FROM NODE     30.00 TO NODE     18.00 =    1093.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     18.00 TO NODE     19.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1516.37  DOWNSTREAM(FEET) =  1516.13
 FLOW LENGTH(FEET) =    48.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.57
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      10.80
 PIPE TRAVEL TIME(MIN.) =   0.14    Tc(MIN.) =   10.79
 LONGEST FLOWPATH FROM NODE     30.00 TO NODE     19.00 =    1141.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     19.00 TO NODE     19.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.391
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8896
 SOIL CLASSIFICATION IS "D"
 SUBAREA AREA(ACRES) =    0.09   SUBAREA RUNOFF(CFS) =    0.27
 TOTAL AREA(ACRES) =        3.4   TOTAL RUNOFF(CFS) =      11.07
 TC(MIN.) =   10.79

****************************************************************************
 FLOW PROCESS FROM NODE     19.00 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) =  1516.13  DOWNSTREAM(FEET) =  1515.07
 FLOW LENGTH(FEET) =   212.00   MANNING'S N =  0.012
```

```
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  16.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.59
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.07
  PIPE TRAVEL TIME(MIN.) =   0.63    Tc(MIN.) =   11.42
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     20.00 =    1353.00 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) =  3.318
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8894
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    0.68   SUBAREA RUNOFF(CFS) =    2.01
  TOTAL AREA(ACRES) =        4.1   TOTAL RUNOFF(CFS) =      13.08
  TC(MIN.) =   11.42

****************************************************************************
  FLOW PROCESS FROM NODE     20.00 TO NODE     21.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1515.07  DOWNSTREAM(FEET) =  1514.80
  FLOW LENGTH(FEET) =    42.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  16.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.35
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      13.08
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =   11.53
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     21.00 =    1395.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     21.00 TO NODE     21.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     60.00 TO NODE     61.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   227.00
  UPSTREAM ELEVATION(FEET) =   1523.50
  DOWNSTREAM ELEVATION(FEET) =   1521.80
  ELEVATION DIFFERENCE(FEET) =      1.70
  TC = 0.303*[(  227.00**3)/(     1.70)]**.2 =    7.065
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.985
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8910
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      1.70
  TOTAL AREA(ACRES) =      0.48   TOTAL RUNOFF(CFS) =      1.70

****************************************************************************
  FLOW PROCESS FROM NODE     61.00 TO NODE     62.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =  1515.61  DOWNSTREAM(FEET) =  1515.51
  FLOW LENGTH(FEET) =     8.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   6.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.98
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.70
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =    7.09
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     62.00 =     235.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     62.00 TO NODE     62.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.980
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8910
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    0.07   SUBAREA RUNOFF(CFS) =    0.25
  TOTAL AREA(ACRES) =        0.6   TOTAL RUNOFF(CFS) =       1.95
  TC(MIN.) =    7.09

****************************************************************************
  FLOW PROCESS FROM NODE     62.00 TO NODE     63.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1515.51  DOWNSTREAM(FEET) =  1514.95
  FLOW LENGTH(FEET) =   112.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.70
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.95
  PIPE TRAVEL TIME(MIN.) =   0.50    Tc(MIN.) =    7.60
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     63.00 =     347.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     63.00 TO NODE     63.00 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.) =    7.60
  RAINFALL INTENSITY(INCH/HR) =   3.88
  TOTAL STREAM AREA(ACRES) =     0.55
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.95

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     71.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   543.00
  UPSTREAM ELEVATION(FEET) =   1526.13
  DOWNSTREAM ELEVATION(FEET) =   1520.93
  ELEVATION DIFFERENCE(FEET) =      5.20
  TC = 0.303*[(  543.00**3)/(     5.20)]**.2 =    9.534
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.554
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8900
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      7.91
```

```
 TOTAL AREA(ACRES) =      2.50   TOTAL RUNOFF(CFS) =      7.91

****************************************************************************
 FLOW PROCESS FROM NODE     71.00 TO NODE     63.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1515.46  DOWNSTREAM(FEET) =  1514.95
 FLOW LENGTH(FEET) =   102.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  12.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.26
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       7.91
 PIPE TRAVEL TIME(MIN.) =   0.32    Tc(MIN.) =    9.86
 LONGEST FLOWPATH FROM NODE     70.00 TO NODE     63.00 =     645.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     63.00 TO NODE     63.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.86
 RAINFALL INTENSITY(INCH/HR) =   3.51
 TOTAL STREAM AREA(ACRES) =     2.50
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.91

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        1.95     7.60        3.876          0.55
     2        7.91     9.86        3.509          2.50

**********************************WARNING***********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
****************************************************************************

 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        8.05     7.60       3.876
     2        9.68     9.86       3.509

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       9.68   Tc(MIN.) =    9.86
 TOTAL AREA(ACRES) =        3.0
 LONGEST FLOWPATH FROM NODE     70.00 TO NODE     63.00 =     645.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     63.00 TO NODE     21.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1514.95  DOWNSTREAM(FEET) =  1514.80
 FLOW LENGTH(FEET) =    19.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.5 INCHES
```

```
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.35
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       9.68
 PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    9.91
 LONGEST FLOWPATH FROM NODE     70.00 TO NODE     21.00 =     664.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     21.00 TO NODE     21.00 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        9.68      9.91       3.503        3.05
 LONGEST FLOWPATH FROM NODE     70.00 TO NODE     21.00 =     664.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc       INTENSITY     AREA
 NUMBER      (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
     1       13.08    11.53       3.305        4.12
 LONGEST FLOWPATH FROM NODE     30.00 TO NODE     21.00 =    1395.00 FEET.

 **********************************WARNING**********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ***************************************************************************

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc       INTENSITY
 NUMBER     (CFS)     (MIN.)    (INCH/HOUR)
     1      20.91       9.91        3.503
     2      22.21      11.53        3.305

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      22.21   Tc(MIN.) =   11.53
 TOTAL AREA(ACRES) =        7.2

****************************************************************************
 FLOW PROCESS FROM NODE     21.00 TO NODE     21.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE     21.00 TO NODE     22.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1514.80  DOWNSTREAM(FEET) =  1514.78
 FLOW LENGTH(FEET) =    16.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  36.0 INCH PIPE IS  26.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.98
 ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      22.21
 PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =   11.60
 LONGEST FLOWPATH FROM NODE     30.00 TO NODE     22.00 =    1411.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     22.00 TO NODE     23.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1517.64  DOWNSTREAM(FEET) =  1514.37
  FLOW LENGTH(FEET) =   654.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  21.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.62
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      22.21
  PIPE TRAVEL TIME(MIN.) =   1.65    Tc(MIN.) =   13.24
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     23.00 =    2065.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     23.00 TO NODE     23.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   106.00
  UPSTREAM ELEVATION(FEET) =   1523.97
  DOWNSTREAM ELEVATION(FEET) =   1521.00
  ELEVATION DIFFERENCE(FEET) =      2.97
  TC = 0.303*[(  106.00**3)/(     2.97)]**.2 =    4.001
  COMPUTED TIME OF CONCENTRATION INCREASED TO 5 MIN.
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.548
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8920
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      0.49
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.49

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1516.36  DOWNSTREAM(FEET) =  1516.19
  FLOW LENGTH(FEET) =    34.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   3.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.63
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.49
  PIPE TRAVEL TIME(MIN.) =   0.22    Tc(MIN.) =    5.22
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =     140.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.476
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8919
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    0.37   SUBAREA RUNOFF(CFS) =    1.48
  TOTAL AREA(ACRES) =        0.5   TOTAL RUNOFF(CFS) =       1.96
  TC(MIN.) =    5.22

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

```
 FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1516.19  DOWNSTREAM(FEET) =  1515.54
 FLOW LENGTH(FEET) =   130.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.70
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.96
 PIPE TRAVEL TIME(MIN.) =   0.58    Tc(MIN.) =    5.80
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =     270.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.297
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8916
 SOIL CLASSIFICATION IS "D"
 SUBAREA AREA(ACRES) =    0.11   SUBAREA RUNOFF(CFS) =    0.42
 TOTAL AREA(ACRES) =        0.6   TOTAL RUNOFF(CFS) =       2.39
 TC(MIN.) =    5.80

****************************************************************************
 FLOW PROCESS FROM NODE    103.00 TO NODE    104.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1515.54  DOWNSTREAM(FEET) =  1515.34
 FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   8.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.83
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       2.39
 PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =    5.97
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    104.00 =     310.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 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.) =    5.97
 RAINFALL INTENSITY(INCH/HR) =   4.25
 TOTAL STREAM AREA(ACRES) =     0.60
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.39

****************************************************************************
 FLOW PROCESS FROM NODE    120.00 TO NODE    121.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   117.00
 UPSTREAM ELEVATION(FEET) =   1525.00
 DOWNSTREAM ELEVATION(FEET) =   1523.13
 ELEVATION DIFFERENCE(FEET) =      1.87
```

```
 TC = 0.303*[(  117.00**3)/(     1.87)]**.2 =    4.657
 COMPUTED TIME OF CONCENTRATION INCREASED TO 5 MIN.
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.548
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8920
 SOIL CLASSIFICATION IS "D"
 SUBAREA RUNOFF(CFS) =      0.45
 TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.45

****************************************************************************
 FLOW PROCESS FROM NODE    121.00 TO NODE    104.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1515.63  DOWNSTREAM(FEET) =  1515.34
 FLOW LENGTH(FEET) =    27.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN   6.0 INCH PIPE IS   3.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.41
 ESTIMATED PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.45
 PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =    5.13
 LONGEST FLOWPATH FROM NODE    120.00 TO NODE    104.00 =     144.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    5.13
 RAINFALL INTENSITY(INCH/HR) =   4.50
 TOTAL STREAM AREA(ACRES) =     0.11
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.45

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        2.39     5.97        4.249          0.60
     2        0.45     5.13        4.503          0.11

 **********************************WARNING**********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ***************************************************************************

 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        2.50     5.13       4.503
     2        2.81     5.97       4.249

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       2.81   Tc(MIN.) =    5.97
 TOTAL AREA(ACRES) =        0.7
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    104.00 =     310.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    104.00 TO NODE    105.00 IS CODE =  31
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1515.34  DOWNSTREAM(FEET) =  1514.71
  FLOW LENGTH(FEET) =   126.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.07
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.81
  PIPE TRAVEL TIME(MIN.) =   0.52    Tc(MIN.) =    6.49
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    105.00 =     436.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 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.) =    6.49
  RAINFALL INTENSITY(INCH/HR) =   4.12
  TOTAL STREAM AREA(ACRES) =     0.71
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.81

****************************************************************************
  FLOW PROCESS FROM NODE    130.00 TO NODE    131.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   354.00
  UPSTREAM ELEVATION(FEET) =   1523.57
  DOWNSTREAM ELEVATION(FEET) =   1520.36
  ELEVATION DIFFERENCE(FEET) =      3.21
  TC = 0.303*[(  354.00**3)/(     3.21)]**.2 =    8.122
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.779
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8905
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      2.46
  TOTAL AREA(ACRES) =      0.73   TOTAL RUNOFF(CFS) =      2.46

****************************************************************************
  FLOW PROCESS FROM NODE    131.00 TO NODE    132.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1515.86  DOWNSTREAM(FEET) =  1515.37
  FLOW LENGTH(FEET) =    97.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   9.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.86
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.46
  PIPE TRAVEL TIME(MIN.) =   0.42    Tc(MIN.) =    8.54
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    132.00 =     451.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    132.00 TO NODE    132.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.707
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8904
```

```
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    0.08   SUBAREA RUNOFF(CFS) =    0.26
  TOTAL AREA(ACRES) =        0.8   TOTAL RUNOFF(CFS) =       2.72
  TC(MIN.) =    8.54

****************************************************************************
  FLOW PROCESS FROM NODE    132.00 TO NODE    105.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1515.37  DOWNSTREAM(FEET) =  1514.71
  FLOW LENGTH(FEET) =   129.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.08
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.72
  PIPE TRAVEL TIME(MIN.) =   0.53    Tc(MIN.) =    9.07
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    105.00 =     580.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.07
  RAINFALL INTENSITY(INCH/HR) =   3.62
  TOTAL STREAM AREA(ACRES) =     0.81
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.72

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        2.81     6.49        4.117          0.71
      2        2.72     9.07        3.623          0.81

 **********************************WARNING**********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ***************************************************************************

  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        4.75     6.49       4.117
      2        5.19     9.07       3.623

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       4.75   Tc(MIN.) =    6.49
  TOTAL AREA(ACRES) =        1.5
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    105.00 =     580.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    106.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =  1514.71  DOWNSTREAM(FEET) =  1514.19
  FLOW LENGTH(FEET) =   104.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS  12.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.48
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.75
  PIPE TRAVEL TIME(MIN.) =   0.39    Tc(MIN.) =    6.88
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    106.00 =     684.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 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.) =    6.88
  RAINFALL INTENSITY(INCH/HR) =   4.03
  TOTAL STREAM AREA(ACRES) =     1.52
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.75

****************************************************************************
  FLOW PROCESS FROM NODE    140.00 TO NODE    141.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   230.00
  UPSTREAM ELEVATION(FEET) =   1524.75
  DOWNSTREAM ELEVATION(FEET) =   1521.05
  ELEVATION DIFFERENCE(FEET) =      3.70
  TC = 0.303*[(  230.00**3)/(     3.70)]**.2 =    6.095
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.217
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8914
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      2.29
  TOTAL AREA(ACRES) =      0.61   TOTAL RUNOFF(CFS) =      2.29

****************************************************************************
  FLOW PROCESS FROM NODE    141.00 TO NODE    106.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1514.37  DOWNSTREAM(FEET) =  1514.19
  FLOW LENGTH(FEET) =    36.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   8.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.81
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.29
  PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =    6.25
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    106.00 =     266.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    106.00 TO NODE    106.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.25
  RAINFALL INTENSITY(INCH/HR) =   4.18
```

```
 TOTAL STREAM AREA(ACRES) =     0.61
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.29

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        4.75     6.88        4.027          1.52
     2        2.29     6.25        4.176          0.61

 ********************************WARNING*********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

 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        6.61     6.25       4.176
     2        6.96     6.88       4.027

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       6.96   Tc(MIN.) =    6.88
 TOTAL AREA(ACRES) =        2.1
 LONGEST FLOWPATH FROM NODE    130.00 TO NODE    106.00 =     684.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    106.00 TO NODE    107.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1514.19  DOWNSTREAM(FEET) =  1512.97
 FLOW LENGTH(FEET) =   127.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.52
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       6.96
 PIPE TRAVEL TIME(MIN.) =   0.32    Tc(MIN.) =    7.20
 LONGEST FLOWPATH FROM NODE    130.00 TO NODE    107.00 =     811.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    107.00 TO NODE    107.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.956
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8909
 SOIL CLASSIFICATION IS "D"
 SUBAREA AREA(ACRES) =    0.06   SUBAREA RUNOFF(CFS) =    0.21
 TOTAL AREA(ACRES) =        2.2   TOTAL RUNOFF(CFS) =       7.18
 TC(MIN.) =    7.20

****************************************************************************
 FLOW PROCESS FROM NODE    107.00 TO NODE    108.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1512.97  DOWNSTREAM(FEET) =  1512.66
 FLOW LENGTH(FEET) =    32.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.7 INCHES
```

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.59
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.18
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    7.28
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    108.00 =     843.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    108.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    150.00 TO NODE    151.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   221.00
  UPSTREAM ELEVATION(FEET) =   1525.50
  DOWNSTREAM ELEVATION(FEET) =   1520.21
  ELEVATION DIFFERENCE(FEET) =      5.29
  TC = 0.303*[(  221.00**3)/(     5.29)]**.2 =    5.540
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.373
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8917
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      2.26
  TOTAL AREA(ACRES) =      0.58   TOTAL RUNOFF(CFS) =      2.26

****************************************************************************
  FLOW PROCESS FROM NODE    151.00 TO NODE    152.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1515.74  DOWNSTREAM(FEET) =  1514.49
  FLOW LENGTH(FEET) =   252.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   8.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.78
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.26
  PIPE TRAVEL TIME(MIN.) =   1.11    Tc(MIN.) =    6.65
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    152.00 =     473.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    152.00 TO NODE    152.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.079
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8912
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    0.12   SUBAREA RUNOFF(CFS) =    0.44
  TOTAL AREA(ACRES) =        0.7   TOTAL RUNOFF(CFS) =       2.70
  TC(MIN.) =    6.65

****************************************************************************
  FLOW PROCESS FROM NODE    152.00 TO NODE    153.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1514.49  DOWNSTREAM(FEET) =  1514.41
```

```
  FLOW LENGTH(FEET) =    14.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   9.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.12
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.70
  PIPE TRAVEL TIME(MIN.) =   0.06    Tc(MIN.) =    6.71
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    153.00 =     487.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    153.00 TO NODE    153.00 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.) =    6.71
  RAINFALL INTENSITY(INCH/HR) =   4.07
  TOTAL STREAM AREA(ACRES) =     0.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.70

****************************************************************************
  FLOW PROCESS FROM NODE    160.00 TO NODE    161.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   293.00
  UPSTREAM ELEVATION(FEET) =   1521.25
  DOWNSTREAM ELEVATION(FEET) =   1520.45
  ELEVATION DIFFERENCE(FEET) =      0.80
  TC = 0.303*[(  293.00**3)/(     0.80)]**.2 =    9.574
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.549
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8900
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      1.93
  TOTAL AREA(ACRES) =      0.61   TOTAL RUNOFF(CFS) =      1.93

****************************************************************************
  FLOW PROCESS FROM NODE    161.00 TO NODE    153.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1514.45  DOWNSTREAM(FEET) =  1514.41
  FLOW LENGTH(FEET) =     8.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.69
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.93
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =    9.61
  LONGEST FLOWPATH FROM NODE    160.00 TO NODE    153.00 =     301.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    153.00 TO NODE    153.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.61
  RAINFALL INTENSITY(INCH/HR) =   3.54
  TOTAL STREAM AREA(ACRES) =     0.61
```

```
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.93

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        2.70     6.71        4.065          0.70
     2        1.93     9.61        3.543          0.61

 ********************************WARNING*********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

 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        4.04     6.71       4.065
     2        4.28     9.61       3.543

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       4.04   Tc(MIN.) =    6.71
 TOTAL AREA(ACRES) =        1.3
 LONGEST FLOWPATH FROM NODE    150.00 TO NODE    153.00 =     487.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    153.00 TO NODE    154.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1514.41  DOWNSTREAM(FEET) =  1514.10
 FLOW LENGTH(FEET) =    63.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  15.0 INCH PIPE IS  10.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.37
 ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       4.04
 PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =    6.95
 LONGEST FLOWPATH FROM NODE    150.00 TO NODE    154.00 =     550.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    154.00 TO NODE    154.00 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.) =    6.95
 RAINFALL INTENSITY(INCH/HR) =   4.01
 TOTAL STREAM AREA(ACRES) =     1.31
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.04

****************************************************************************
 FLOW PROCESS FROM NODE    170.00 TO NODE    171.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   191.00
 UPSTREAM ELEVATION(FEET) =   1520.50
```

```
  DOWNSTREAM ELEVATION(FEET) =   1518.67
  ELEVATION DIFFERENCE(FEET) =      1.83
  TC = 0.303*[(  191.00**3)/(     1.83)]**.2 =    6.277
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.170
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8913
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      1.34
  TOTAL AREA(ACRES) =      0.36   TOTAL RUNOFF(CFS) =      1.34

****************************************************************************
  FLOW PROCESS FROM NODE    171.00 TO NODE    172.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1514.63  DOWNSTREAM(FEET) =  1514.32
  FLOW LENGTH(FEET) =    59.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   5.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.45
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.34
  PIPE TRAVEL TIME(MIN.) =   0.29    Tc(MIN.) =    6.56
  LONGEST FLOWPATH FROM NODE    170.00 TO NODE    172.00 =     250.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    172.00 TO NODE    172.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.100
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8912
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    0.07   SUBAREA RUNOFF(CFS) =    0.26
  TOTAL AREA(ACRES) =        0.4   TOTAL RUNOFF(CFS) =       1.59
  TC(MIN.) =    6.56

****************************************************************************
  FLOW PROCESS FROM NODE    172.00 TO NODE    154.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1514.32  DOWNSTREAM(FEET) =  1514.10
  FLOW LENGTH(FEET) =    45.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.51
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.59
  PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =    6.78
  LONGEST FLOWPATH FROM NODE    170.00 TO NODE    154.00 =     295.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    154.00 TO NODE    154.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    6.78
  RAINFALL INTENSITY(INCH/HR) =   4.05
  TOTAL STREAM AREA(ACRES) =     0.43
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.59

  ** CONFLUENCE DATA **
```

```
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        4.04     6.95        4.011          1.31
     2        1.59     6.78        4.050          0.43

 ********************************WARNING*********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

  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        5.54     6.78       4.050
      2        5.62     6.95       4.011

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       5.62   Tc(MIN.) =    6.95
  TOTAL AREA(ACRES) =        1.7
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    154.00 =     550.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    154.00 TO NODE    155.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1514.10  DOWNSTREAM(FEET) =  1513.91
  FLOW LENGTH(FEET) =    37.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.87
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.62
  PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =    7.07
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    155.00 =     587.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    155.00 TO NODE    155.00 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.) =    7.07
  RAINFALL INTENSITY(INCH/HR) =   3.98
  TOTAL STREAM AREA(ACRES) =     1.74
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.62

****************************************************************************
  FLOW PROCESS FROM NODE    180.00 TO NODE    181.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   203.00
  UPSTREAM ELEVATION(FEET) =   1524.30
  DOWNSTREAM ELEVATION(FEET) =   1520.26
  ELEVATION DIFFERENCE(FEET) =      4.04
  TC = 0.303*[(  203.00**3)/(     4.04)]**.2 =    5.557
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.368
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8917
 SOIL CLASSIFICATION IS "D"
 SUBAREA RUNOFF(CFS) =      1.13
 TOTAL AREA(ACRES) =      0.29   TOTAL RUNOFF(CFS) =      1.13

****************************************************************************
 FLOW PROCESS FROM NODE    181.00 TO NODE    155.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1514.01  DOWNSTREAM(FEET) =  1513.91
 FLOW LENGTH(FEET) =    29.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   2.83
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.13
 PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =    5.73
 LONGEST FLOWPATH FROM NODE    180.00 TO NODE    155.00 =     232.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    155.00 TO NODE    155.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    5.73
 RAINFALL INTENSITY(INCH/HR) =   4.32
 TOTAL STREAM AREA(ACRES) =     0.29
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.13

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        5.62     7.07        3.984          1.74
     2        1.13     5.73        4.318          0.29

 *********************************WARNING*********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 *************************************************************************

 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        5.68     5.73       4.318
     2        6.66     7.07       3.984

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       6.66   Tc(MIN.) =    7.07
 TOTAL AREA(ACRES) =        2.0
 LONGEST FLOWPATH FROM NODE    150.00 TO NODE    155.00 =     587.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    155.00 TO NODE    156.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
==========================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1513.91  DOWNSTREAM(FEET) =  1513.75
  FLOW LENGTH(FEET) =    33.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.92
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.66
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =    7.19
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    156.00 =     620.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    156.00 TO NODE    156.00 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.) =    7.19
  RAINFALL INTENSITY(INCH/HR) =   3.96
  TOTAL STREAM AREA(ACRES) =     2.03
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.66

****************************************************************************
  FLOW PROCESS FROM NODE    190.00 TO NODE    191.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   314.00
  UPSTREAM ELEVATION(FEET) =   1525.80
  DOWNSTREAM ELEVATION(FEET) =   1520.70
  ELEVATION DIFFERENCE(FEET) =      5.10
  TC = 0.303*[(  314.00**3)/(     5.10)]**.2 =    6.890
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.024
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8910
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      3.23
  TOTAL AREA(ACRES) =      0.90   TOTAL RUNOFF(CFS) =      3.23

****************************************************************************
  FLOW PROCESS FROM NODE    191.00 TO NODE    156.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1514.56  DOWNSTREAM(FEET) =  1513.75
  FLOW LENGTH(FEET) =   162.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   9.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.21
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.23
  PIPE TRAVEL TIME(MIN.) =   0.64    Tc(MIN.) =    7.53
  LONGEST FLOWPATH FROM NODE    190.00 TO NODE    156.00 =     476.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    156.00 TO NODE    156.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.53
```

```
 RAINFALL INTENSITY(INCH/HR) =   3.89
 TOTAL STREAM AREA(ACRES) =     0.90
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.23

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        6.66     7.19        3.960          2.03
     2        3.23     7.53        3.889          0.90

 ********************************WARNING*********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

 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        9.74     7.19       3.960
     2        9.77     7.53       3.889

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       9.74   Tc(MIN.) =    7.19
 TOTAL AREA(ACRES) =        2.9
 LONGEST FLOWPATH FROM NODE    150.00 TO NODE    156.00 =     620.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    156.00 TO NODE    108.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1513.75  DOWNSTREAM(FEET) =  1512.66
 FLOW LENGTH(FEET) =    70.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.48
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       9.74
 PIPE TRAVEL TIME(MIN.) =   0.14    Tc(MIN.) =    7.32
 LONGEST FLOWPATH FROM NODE    150.00 TO NODE    108.00 =     690.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    108.00 TO NODE    108.00 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        9.74     7.32       3.931        2.93
 LONGEST FLOWPATH FROM NODE    150.00 TO NODE    108.00 =     690.00 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1        7.18     7.28       3.940        2.19
 LONGEST FLOWPATH FROM NODE    130.00 TO NODE    108.00 =     843.00 FEET.

 ********************************WARNING*********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
```

```
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ****************************************************************************

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      16.86       7.28        3.940
      2      16.90       7.32        3.931

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      16.90   Tc(MIN.) =    7.32
  TOTAL AREA(ACRES) =        5.1

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    108.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    108.00 TO NODE    109.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1512.66  DOWNSTREAM(FEET) =  1511.91
  FLOW LENGTH(FEET) =    48.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.67
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      16.90
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    7.41
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    109.00 =     891.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.41
  RAINFALL INTENSITY(INCH/HR) =   3.91
  TOTAL STREAM AREA(ACRES) =     5.12
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     16.90

****************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE    201.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   317.00
  UPSTREAM ELEVATION(FEET) =   1524.74
  DOWNSTREAM ELEVATION(FEET) =   1517.89
  ELEVATION DIFFERENCE(FEET) =      6.85
  TC = 0.303*[(  317.00**3)/(     6.85)]**.2 =    6.533
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.107
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8912
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      7.83
  TOTAL AREA(ACRES) =      2.14   TOTAL RUNOFF(CFS) =      7.83
```

```
****************************************************************************
 FLOW PROCESS FROM NODE    201.00 TO NODE    109.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1512.08  DOWNSTREAM(FEET) =  1511.91
 FLOW LENGTH(FEET) =    33.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.13
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       7.83
 PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =    6.64
 LONGEST FLOWPATH FROM NODE    200.00 TO NODE    109.00 =     350.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    109.00 TO NODE    109.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    6.64
 RAINFALL INTENSITY(INCH/HR) =   4.08
 TOTAL STREAM AREA(ACRES) =     2.14
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.83

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       16.90     7.41        3.914          5.12
     2        7.83     6.64        4.081          2.14

 **********************************WARNING*********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ****************************************************************************

 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       22.99     6.64       4.081
     2       24.41     7.41       3.914

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      24.41   Tc(MIN.) =    7.41
 TOTAL AREA(ACRES) =        7.3
 LONGEST FLOWPATH FROM NODE    130.00 TO NODE    109.00 =     891.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    109.00 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) =  1511.91  DOWNSTREAM(FEET) =  1511.59
 FLOW LENGTH(FEET) =    21.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  10.48
```

```
 ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      24.41
 PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =    7.44
 LONGEST FLOWPATH FROM NODE    130.00 TO NODE    110.00 =     912.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    110.00 TO NODE     23.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1514.56  DOWNSTREAM(FEET) =  1514.37
 FLOW LENGTH(FEET) =    18.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  19.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.90
 ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      24.41
 PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =    7.47
 LONGEST FLOWPATH FROM NODE    130.00 TO NODE     23.00 =     930.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     23.00 TO NODE     23.00 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       24.41     7.47       3.901        7.26
 LONGEST FLOWPATH FROM NODE    130.00 TO NODE     23.00 =     930.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
     1       22.21    13.24       3.135        7.17
 LONGEST FLOWPATH FROM NODE     30.00 TO NODE     23.00 =    2065.00 FEET.

 ****************************WARNING*********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ********************************************************************

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc      INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1      36.95       7.47       3.901
     2      41.83      13.24       3.135

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      36.95   Tc(MIN.) =    7.47
 TOTAL AREA(ACRES) =       14.4

****************************************************************************
 FLOW PROCESS FROM NODE     23.00 TO NODE     24.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 ELEVATION DATA: UPSTREAM(FEET) =  1514.37  DOWNSTREAM(FEET) =  1514.11
 FLOW LENGTH(FEET) =    51.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  33.0 INCH PIPE IS  25.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.62
 ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
```

```
  PIPE-FLOW(CFS) =      36.95
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =    7.58
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     24.00 =    2116.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       14.4  TC(MIN.) =      7.58
  PEAK FLOW RATE(CFS)   =      36.95
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

Appendix F – Offsite Storm Facility Exhibit

EXISTING LINE H
(EARTHEN CHANNEL)

EXISTING LINE H
(4'X8' RCB)

EXISTING LINE H-3
(36" RCP)

RAMONA EXPRESS

EXISTING LINE H-2
(48" RCP)

EXISTING LINE H-3 EXTENSION
(24" RCP)

PROPOSED LINE H-2 EXTENSION
(48" RCP)

60' SD

Q10=75

SD

Q10=55

LINE H-1

STATE STREET

Q10=75

MDP PROPOSED LINE H-1
(48" RCP)

MDP PROPOSED LINE H
(60"-36" RCP)

IDYLLWILD DRIVE

EAGLE ROAD

LEGEND:

- EXISTING MDP LINE H
- PROPOSED MDP LINE H
- EXISTING MDP LINE H-1
- EXISTING MDP LINE H-2
- PROPOSED MDP LINE H-2 EXTENSION
- EXISTING MDP LINE H-3
- PROPOSED PROJECT LIMITS

DRAWN: PJ
DATE: 09/13/2023
CHECKED:
DATE:
JOB NO:

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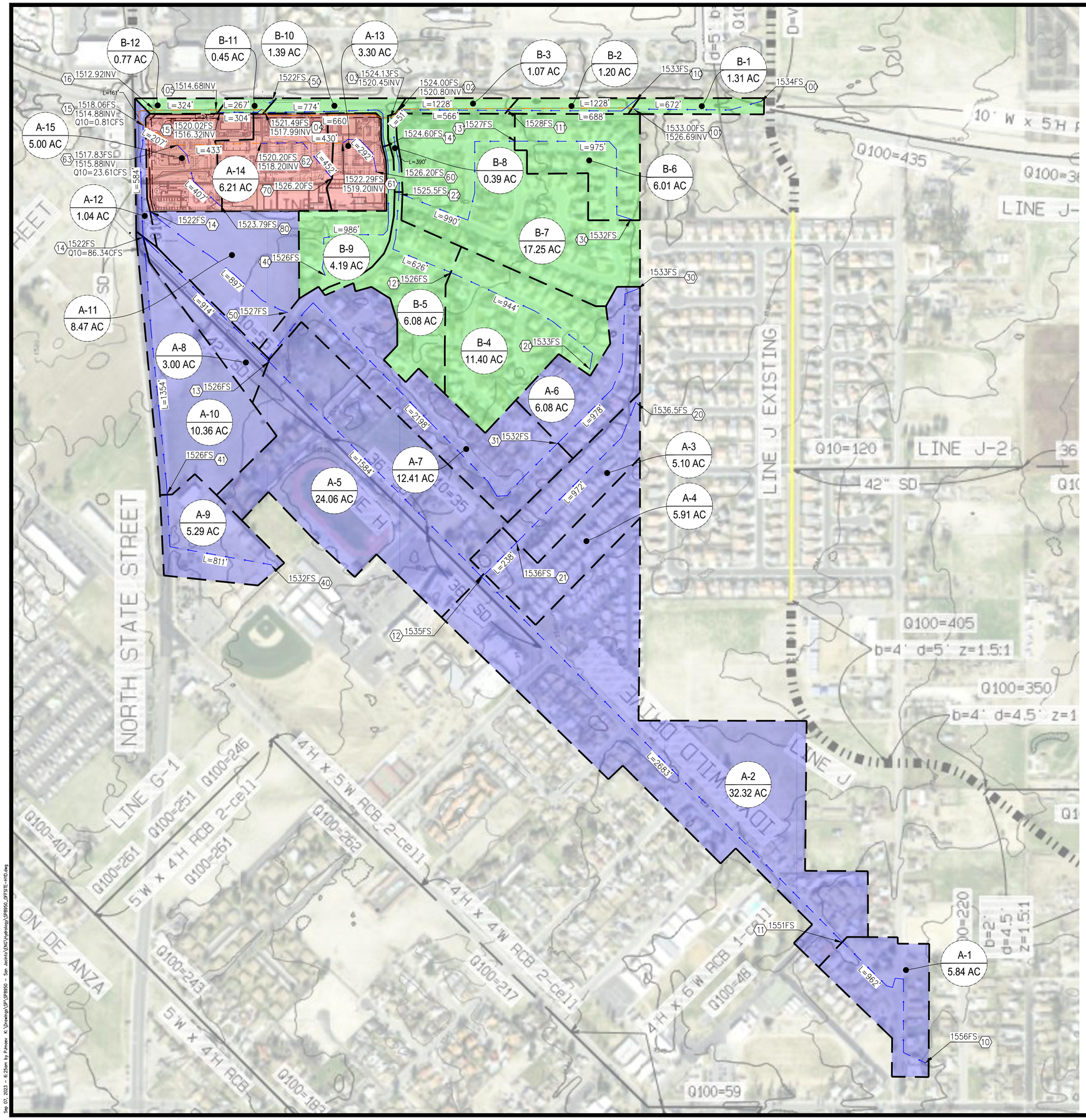
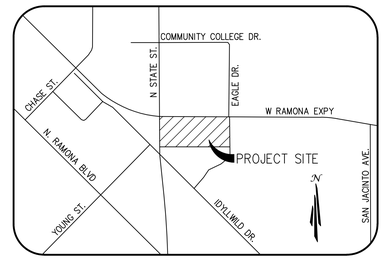
1 OF 1

9/13/2023 OFFSITE STORM DRAIN EXHIBIT

Sep 13, 2023 - 3:49pm by PJmaev K:\Drawings\SP\SP8950 - San Jacinto\ENG\Hydrology\SP8950_SD EXHIBIT.dwg

Appendix G – Offsite Hydrology Map and Rational Method





VICINITY MAP
N.T.S.

LEGEND:

- DRAINAGE SUB-BOUNDARY
- SURFACE FLOW PATH
- PIPE FLOW
- 10.00FS / 5.00INV / 10 — SURFACE ELEVATION, HYDROLOGIC NODE NUMBER, INVERT ELEVATION
- EXISTING SURFACE CONTOUR
- L=1000' — FLOW LENGTH
- ONSITE HYDROLOGY AREA
- AREA TRIBUTARY TO STATE STREEET
- AREA TRIBUTARY TO RAMONA EXPRESSWAY

Subarea	Area (acres)	Soil Type	Land Use
A-1	5.36	A	7,200 - 10,0000 SF. Lots
A-1	0.48	A	Open Space
A-2	2.83	D	Commercial
A-2	3.02	D	Open Space
A-2	2.19	A	Open Space
A-2	16.39	D	7,200 - 10,0000 SF. Lots
A-2	7.89	A	7,200 - 10,0000 SF. Lots
A-3	5.10	D	7,200 - 10,0000 SF. Lots
A-4	5.91	D	7,200 - 10,0000 SF. Lots
A-5	3.49	D	Commercial
A-5	2.75	D	Open Space
A-5	5.33	D	Turf
A-5	2.23	D	Apartments
A-5	10.26	D	7,200 - 10,0000 SF. Lots
A-6	6.08	D	7,200 - 10,0000 SF. Lots
A-7	12.41	D	7,200 - 10,0000 SF. Lots
A-8	1.05	D	Commercial
A-8	1.81	D	Open Space
A-8	0.14	D	7,200 - 10,0000 SF. Lots
A-9	5.29	D	Commercial
A-10	1.37	D	Commercial
A-10	8.99	D	Open Space
A-11	8.47	D	Open Space
A-12	1.04	D	Commercial
A-13	3.30	D	Commercial
A-14	6.21	D	Commercial
A-15	5.00	D	Commercial
B-1	1.31	D	Commercial
B-2	1.20	D	Commercial
B-3	1.07	D	Commercial
B-4	11.40	D	7,200 - 10,0000 SF. Lots
B-5	6.08	D	7,200 - 10,0000 SF. Lots
B-6	6.01	D	7,200 - 10,0000 SF. Lots
B-7	17.25	D	7,200 - 10,0000 SF. Lots
B-8	0.39	D	Commercial
B-9	4.19	D	7,200 - 10,0000 SF. Lots
B-10	1.39	D	Commercial
B-11	0.45	D	Commercial
B-12	0.77	D	Commercial

NO.	DESCRIPTION	DATE	BY
	REVISIONS		

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PROPOSED HYDROLOGY MAP

THE MAGNET
RICH DEVELOPMENT
600 N TUSTIN, SUITE 150
SAN JACINTO, CA

DRAWN: TLP
DATE: 1/04/2022
CHECKED:
DATE:
REVISION #:
DATE:
JOB NO. SP8950

1 OF 1

12/14/2021 Internal Review

Sep 07, 2021 - 6:25pm by P.Pineo K:\Drawings\SP\SP8950 - San Jacinto\DWG\Hydrology\SP8950_OFFSITE_HYD.dwg

```
**************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
        RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                    (RCFC&WCD)  1978 HYDROLOGY MANUAL
         (c) Copyright 1982-2016 Advanced Engineering Software (aes)
                    (Rational Tabling Version 23.0)
                Release Date: 07/01/2016  License ID 1334

                          Analysis prepared by:
```

```
 ************************* DESCRIPTION OF STUDY *************************
* SP8950 SAN JACINTO                                                    *
* OFFSITE RUN-ON RATIONAL METHOD                                        *
* 10-YEAR STORM EVENT  PJ                                               *
 ************************************************************************

  FILE NAME: SJ10RO.DAT
  TIME/DATE OF STUDY: 13:54 09/06/2023
------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.95
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  1.730
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.874
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  3.490
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.760
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.3810757
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.3820757
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =   10.00   1-HOUR INTENSITY(INCH/HOUR) =   0.883
  SLOPE OF INTENSITY DURATION CURVE = 0.3811
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
        AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
  *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     11.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   962.00
  UPSTREAM ELEVATION(FEET) =   1556.00
  DOWNSTREAM ELEVATION(FEET) =   1551.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  TC = 0.393*[(  962.00**3)/(     5.00)]**.2 =   17.541
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.410
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .5996
  SOIL CLASSIFICATION IS "A"
  SUBAREA RUNOFF(CFS) =      4.53
  TOTAL AREA(ACRES) =      5.36   TOTAL RUNOFF(CFS) =      4.53

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     11.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.410
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .2991
  SOIL CLASSIFICATION IS "A"
  SUBAREA AREA(ACRES) =    0.48   SUBAREA RUNOFF(CFS) =    0.20
  TOTAL AREA(ACRES) =        5.8   TOTAL RUNOFF(CFS) =       4.74
  TC(MIN.) =   17.54

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     12.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1551.00  DOWNSTREAM ELEVATION(FEET) = 1535.00
  STREET LENGTH(FEET) =  2683.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018
```

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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.99
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.39
    HALFSTREET FLOOD WIDTH(FEET) =   12.46
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.90
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.73
  STREET FLOW TRAVEL TIME(MIN.) =  23.59   Tc(MIN.) =   41.13
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.019
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8727
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    2.83      SUBAREA RUNOFF(CFS) =    2.52
  TOTAL AREA(ACRES) =        8.7        PEAK FLOW RATE(CFS) =       7.25

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.40   HALFSTREET FLOOD WIDTH(FEET) =  13.55
  FLOW VELOCITY(FEET/SEC.) =  1.98   DEPTH*VELOCITY(FT*FT/SEC.) =   0.80
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     12.00 =    3645.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE     12.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.019
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6267
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    3.02   SUBAREA RUNOFF(CFS) =    1.93
  TOTAL AREA(ACRES) =       11.7   TOTAL RUNOFF(CFS) =       9.18
  TC(MIN.) =   41.13

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE     12.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.019
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .2381
  SOIL CLASSIFICATION IS "A"
  SUBAREA AREA(ACRES) =    2.19   SUBAREA RUNOFF(CFS) =    0.53
  TOTAL AREA(ACRES) =       13.9   TOTAL RUNOFF(CFS) =       9.71
  TC(MIN.) =   41.13

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE     12.00 IS CODE =  81
```

```
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.019
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7634
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =   16.39   SUBAREA RUNOFF(CFS) =   12.75
  TOTAL AREA(ACRES) =       30.3   TOTAL RUNOFF(CFS) =      22.47
  TC(MIN.) =   41.13

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE     12.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.019
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .5691
  SOIL CLASSIFICATION IS "A"
  SUBAREA AREA(ACRES) =    7.89   SUBAREA RUNOFF(CFS) =    4.58
  TOTAL AREA(ACRES) =       38.2   TOTAL RUNOFF(CFS) =      27.04
  TC(MIN.) =   41.13

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE     12.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   41.13
  RAINFALL INTENSITY(INCH/HR) =   1.02
  TOTAL STREAM AREA(ACRES) =    38.16
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     27.04

****************************************************************************
  FLOW PROCESS FROM NODE     20.00 TO NODE     21.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   972.00
  UPSTREAM ELEVATION(FEET) =   1536.50
  DOWNSTREAM ELEVATION(FEET) =   1536.00
  ELEVATION DIFFERENCE(FEET) =      0.50
  TC = 0.393*[(  972.00**3)/(     0.50)]**.2 =   27.974
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.181
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7769
  SOIL CLASSIFICATION IS "D"
```

```
  SUBAREA RUNOFF(CFS) =      4.68
  TOTAL AREA(ACRES) =      5.10   TOTAL RUNOFF(CFS) =      4.68

****************************************************************************
  FLOW PROCESS FROM NODE     21.00 TO NODE     12.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1536.00  DOWNSTREAM ELEVATION(FEET) = 1535.00
  STREET LENGTH(FEET) =   238.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.30
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.42
    HALFSTREET FLOOD WIDTH(FEET) =   14.65
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.73
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.73
  STREET FLOW TRAVEL TIME(MIN.) =   2.29   Tc(MIN.) =   30.27
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.146
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7742
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    5.91      SUBAREA RUNOFF(CFS) =    5.24
  TOTAL AREA(ACRES) =       11.0        PEAK FLOW RATE(CFS) =       9.92

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.46   HALFSTREET FLOOD WIDTH(FEET) =  16.68
  FLOW VELOCITY(FEET/SEC.) =  1.85   DEPTH*VELOCITY(FT*FT/SEC.) =   0.85
  LONGEST FLOWPATH FROM NODE     20.00 TO NODE     12.00 =    1210.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE     12.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   30.27
  RAINFALL INTENSITY(INCH/HR) =   1.15
```

```
 TOTAL STREAM AREA(ACRES) =    11.01
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.92

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       27.04    41.13        1.019         38.16
     2        9.92    30.27        1.146         11.01

 ********************************WARNING*********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

 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       29.82    30.27       1.146
     2       35.87    41.13       1.019

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      35.87   Tc(MIN.) =   41.13
 TOTAL AREA(ACRES) =       49.2
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     12.00 =    3645.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     12.00 TO NODE     13.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1535.00  DOWNSTREAM ELEVATION(FEET) = 1526.00
 STREET LENGTH(FEET) =  1584.00   CURB HEIGHT(INCHES) =  8.0
 STREET HALFWIDTH(FEET) = 30.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.018
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

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

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      37.31
   STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
```

```
    STREET FLOW DEPTH(FEET) =  0.64
    HALFSTREET FLOOD WIDTH(FEET) =   26.60
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.86
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.83
  STREET FLOW TRAVEL TIME(MIN.) =   9.22   Tc(MIN.) =   50.35
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.944
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8712
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    3.49      SUBAREA RUNOFF(CFS) =    2.87
  TOTAL AREA(ACRES) =       52.7        PEAK FLOW RATE(CFS) =      38.74

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.64   HALFSTREET FLOOD WIDTH(FEET) =  26.99
  FLOW VELOCITY(FEET/SEC.) =  2.89   DEPTH*VELOCITY(FT*FT/SEC.) =   1.86
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     13.00 =    5229.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.944
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6119
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    2.75   SUBAREA RUNOFF(CFS) =    1.59
  TOTAL AREA(ACRES) =       55.4   TOTAL RUNOFF(CFS) =      40.33
  TC(MIN.) =   50.35

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.944
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6119
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    5.33   SUBAREA RUNOFF(CFS) =    3.08
  TOTAL AREA(ACRES) =       60.7   TOTAL RUNOFF(CFS) =      43.41
  TC(MIN.) =   50.35

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.944
  APARTMENT DEVELOPMENT RUNOFF COEFFICIENT = .8424
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    2.23   SUBAREA RUNOFF(CFS) =    1.77
  TOTAL AREA(ACRES) =       63.0   TOTAL RUNOFF(CFS) =      45.18
```

```
  TC(MIN.) =   50.35

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.944
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7559
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =   10.26   SUBAREA RUNOFF(CFS) =    7.32
  TOTAL AREA(ACRES) =       73.2   TOTAL RUNOFF(CFS) =      52.50
  TC(MIN.) =   50.35

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   50.35
  RAINFALL INTENSITY(INCH/HR) =   0.94
  TOTAL STREAM AREA(ACRES) =    73.23
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     52.50

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE     31.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   978.00
  UPSTREAM ELEVATION(FEET) =   1533.00
  DOWNSTREAM ELEVATION(FEET) =   1532.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  TC = 0.393*[(  978.00**3)/(     1.00)]**.2 =   24.443
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.243
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7815
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      5.91
  TOTAL AREA(ACRES) =      6.08   TOTAL RUNOFF(CFS) =      5.91

****************************************************************************
  FLOW PROCESS FROM NODE     31.00 TO NODE     13.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
```

```
==========================================================================
  UPSTREAM ELEVATION(FEET) = 1532.00  DOWNSTREAM ELEVATION(FEET) = 1526.00
  STREET LENGTH(FEET) =  2198.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.48
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.49
    HALFSTREET FLOOD WIDTH(FEET) =   18.55
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.60
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.79
  STREET FLOW TRAVEL TIME(MIN.) =  22.85   Tc(MIN.) =   47.29
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.967
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7583
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =   12.41      SUBAREA RUNOFF(CFS) =    9.10
  TOTAL AREA(ACRES) =       18.5        PEAK FLOW RATE(CFS) =      15.00

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.55   HALFSTREET FLOOD WIDTH(FEET) =  21.45
  FLOW VELOCITY(FEET/SEC.) =  1.74   DEPTH*VELOCITY(FT*FT/SEC.) =   0.95
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     13.00 =    3176.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   47.29
  RAINFALL INTENSITY(INCH/HR) =   0.97
  TOTAL STREAM AREA(ACRES) =    18.49
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     15.00

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       52.50    50.35        0.944         73.23
      2       15.00    47.29        0.967         18.49
```

```
 ********************************WARNING*********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

  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       64.31    47.29       0.967
      2       67.15    50.35       0.944

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      67.15   Tc(MIN.) =   50.35
  TOTAL AREA(ACRES) =       91.7
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     13.00 =    5229.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     14.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1526.00  DOWNSTREAM ELEVATION(FEET) = 1522.00
  STREET LENGTH(FEET) =   914.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      67.62
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.77
    HALFSTREET FLOOD WIDTH(FEET) =   35.34
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.14
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.43
  STREET FLOW TRAVEL TIME(MIN.) =   4.85   Tc(MIN.) =   55.20
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.911
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8705
```

```
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    1.19      SUBAREA RUNOFF(CFS) =    0.94
  TOTAL AREA(ACRES) =       92.9        PEAK FLOW RATE(CFS) =      68.09

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.77   HALFSTREET FLOOD WIDTH(FEET) =  35.40
  FLOW VELOCITY(FEET/SEC.) =  3.15   DEPTH*VELOCITY(FT*FT/SEC.) =   2.44
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     14.00 =    6143.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     14.00 TO NODE     14.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.911
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6049
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    1.81   SUBAREA RUNOFF(CFS) =    1.00
  TOTAL AREA(ACRES) =       94.7   TOTAL RUNOFF(CFS) =      69.09
  TC(MIN.) =   55.20

****************************************************************************
  FLOW PROCESS FROM NODE     14.00 TO NODE     14.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   55.20
  RAINFALL INTENSITY(INCH/HR) =   0.91
  TOTAL STREAM AREA(ACRES) =    94.72
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     69.09

****************************************************************************
  FLOW PROCESS FROM NODE     40.00 TO NODE     41.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   811.00
  UPSTREAM ELEVATION(FEET) =   1532.00
  DOWNSTREAM ELEVATION(FEET) =   1526.00
  ELEVATION DIFFERENCE(FEET) =      6.00
  TC = 0.303*[(  811.00**3)/(     6.00)]**.2 =   11.786
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.641
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8808
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      7.65
```

```
  TOTAL AREA(ACRES) =      5.29   TOTAL RUNOFF(CFS) =      7.65

****************************************************************************
  FLOW PROCESS FROM NODE     41.00 TO NODE     14.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1526.00  DOWNSTREAM ELEVATION(FEET) = 1522.00
  STREET LENGTH(FEET) =  1354.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       8.40
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.56
    HALFSTREET FLOOD WIDTH(FEET) =   22.07
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.85
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.03
  STREET FLOW TRAVEL TIME(MIN.) =  12.21   Tc(MIN.) =   23.99
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.252
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8764
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    1.37      SUBAREA RUNOFF(CFS) =    1.50
  TOTAL AREA(ACRES) =        6.7        PEAK FLOW RATE(CFS) =       9.15

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.57   HALFSTREET FLOOD WIDTH(FEET) =  22.85
  FLOW VELOCITY(FEET/SEC.) =  1.88   DEPTH*VELOCITY(FT*FT/SEC.) =   1.08
  LONGEST FLOWPATH FROM NODE     40.00 TO NODE     14.00 =    2165.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     14.00 TO NODE     14.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.252
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6642
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    8.99   SUBAREA RUNOFF(CFS) =    7.47
  TOTAL AREA(ACRES) =       15.6   TOTAL RUNOFF(CFS) =      16.62
  TC(MIN.) =   23.99
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     14.00 TO NODE     14.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   23.99
  RAINFALL INTENSITY(INCH/HR) =   1.25
  TOTAL STREAM AREA(ACRES) =    15.65
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     16.62

****************************************************************************
  FLOW PROCESS FROM NODE     50.00 TO NODE     14.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   897.00
  UPSTREAM ELEVATION(FEET) =   1527.00
  DOWNSTREAM ELEVATION(FEET) =   1522.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  TC = 0.533*[(  897.00**3)/(     5.00)]**.2 =   22.818
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.276
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6675
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      7.21
  TOTAL AREA(ACRES) =      8.47   TOTAL RUNOFF(CFS) =      7.21

****************************************************************************
  FLOW PROCESS FROM NODE     14.00 TO NODE     14.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =   22.82
  RAINFALL INTENSITY(INCH/HR) =   1.28
  TOTAL STREAM AREA(ACRES) =     8.47
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.21

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       69.09    55.20        0.911         94.72
      2       16.62    23.99        1.252         15.65
```

```
     3        7.21    22.82        1.276          8.47

 ********************************WARNING*********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1       51.58    22.82       1.276
      2       53.73    23.99       1.252
      3       86.34    55.20       0.911

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      86.34   Tc(MIN.) =   55.20
  TOTAL AREA(ACRES) =      118.8
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     14.00 =    6143.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     14.00 TO NODE     15.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1522.00  DOWNSTREAM ELEVATION(FEET) = 1518.06
  STREET LENGTH(FEET) =   584.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      86.75
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.78
    HALFSTREET FLOOD WIDTH(FEET) =   35.70
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.93
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.07
  STREET FLOW TRAVEL TIME(MIN.) =   2.47   Tc(MIN.) =   57.67
```

```
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  0.896
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8702
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    1.04      SUBAREA RUNOFF(CFS) =    0.81
  TOTAL AREA(ACRES) =      119.9        PEAK FLOW RATE(CFS) =      87.15

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.78   HALFSTREET FLOOD WIDTH(FEET) =  35.76
  FLOW VELOCITY(FEET/SEC.) =  3.94   DEPTH*VELOCITY(FT*FT/SEC.) =   3.08
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     15.00 =    6727.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     15.00 TO NODE     15.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     60.00 TO NODE     61.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   292.00
  UPSTREAM ELEVATION(FEET) =   1526.20
  DOWNSTREAM ELEVATION(FEET) =   1522.29
  ELEVATION DIFFERENCE(FEET) =      3.91
  TC = 0.303*[(  292.00**3)/(     3.91)]**.2 =    6.956
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.006
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8837
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      5.85
  TOTAL AREA(ACRES) =      3.30   TOTAL RUNOFF(CFS) =      5.85

****************************************************************************
  FLOW PROCESS FROM NODE     61.00 TO NODE     62.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1519.20  DOWNSTREAM(FEET) =  1518.20
  FLOW LENGTH(FEET) =   430.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.65
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.85
  PIPE TRAVEL TIME(MIN.) =   1.96    Tc(MIN.) =    8.92
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     62.00 =     722.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     62.00 TO NODE     62.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.92
  RAINFALL INTENSITY(INCH/HR) =   1.83
  TOTAL STREAM AREA(ACRES) =     3.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.85

****************************************************************************
  FLOW PROCESS FROM NODE     70.00 TO NODE     62.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   452.00
  UPSTREAM ELEVATION(FEET) =   1526.20
  DOWNSTREAM ELEVATION(FEET) =   1520.20
  ELEVATION DIFFERENCE(FEET) =      6.00
  TC = 0.303*[(  452.00**3)/(     6.00)]**.2 =    8.299
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.876
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8828
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =     10.28
  TOTAL AREA(ACRES) =      6.21   TOTAL RUNOFF(CFS) =     10.28

****************************************************************************
  FLOW PROCESS FROM NODE     62.00 TO NODE     62.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.30
  RAINFALL INTENSITY(INCH/HR) =   1.88
  TOTAL STREAM AREA(ACRES) =     6.21
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.28

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        5.85     8.92        1.825          3.30
      2       10.28     8.30        1.876          6.21
```

```
 ********************************WARNING*********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

  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       15.73     8.30       1.876
      2       15.86     8.92       1.825

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      15.73   Tc(MIN.) =    8.30
  TOTAL AREA(ACRES) =        9.5
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     62.00 =     722.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     62.00 TO NODE     63.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1518.20  DOWNSTREAM(FEET) =  1515.88
  FLOW LENGTH(FEET) =   433.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  17.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.30
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      15.73
  PIPE TRAVEL TIME(MIN.) =   1.15    Tc(MIN.) =    9.45
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     63.00 =    1155.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     63.00 TO NODE     63.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.45
  RAINFALL INTENSITY(INCH/HR) =   1.79
  TOTAL STREAM AREA(ACRES) =     9.51
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     15.73

****************************************************************************
  FLOW PROCESS FROM NODE     80.00 TO NODE     63.00 IS CODE =  21
```

```
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   407.00
  UPSTREAM ELEVATION(FEET) =   1523.79
  DOWNSTREAM ELEVATION(FEET) =   1517.83
  ELEVATION DIFFERENCE(FEET) =      5.96
  TC = 0.303*[(  407.00**3)/(     5.96)]**.2 =    7.804
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.920
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8831
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      8.48
  TOTAL AREA(ACRES) =      5.00   TOTAL RUNOFF(CFS) =      8.48

****************************************************************************
  FLOW PROCESS FROM NODE     63.00 TO NODE     63.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.80
  RAINFALL INTENSITY(INCH/HR) =   1.92
  TOTAL STREAM AREA(ACRES) =     5.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.48

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       15.73     9.45        1.786          9.51
      2        8.48     7.80        1.920          5.00

 ********************************WARNING*********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

  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       21.47     7.80       1.920
      2       23.61     9.45       1.786
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      23.61   Tc(MIN.) =    9.45
  TOTAL AREA(ACRES) =       14.5
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     63.00 =    1155.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     63.00 TO NODE     15.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1515.88  DOWNSTREAM(FEET) =  1514.88
  FLOW LENGTH(FEET) =   207.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  20.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.78
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      23.61
  PIPE TRAVEL TIME(MIN.) =   0.51    Tc(MIN.) =    9.95
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     15.00 =    1362.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     15.00 TO NODE     15.00 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       23.61     9.95       1.750       14.51
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     15.00 =    1362.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       87.15    57.67       0.896      119.88
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     15.00 =    6727.00 FEET.

 ****************************************WARNING****************************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ***************************************************************************

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      38.66       9.95        1.750
      2      99.24      57.67        0.896
```

```
  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      99.24   Tc(MIN.) =   57.67
  TOTAL AREA(ACRES) =      134.4

****************************************************************************
  FLOW PROCESS FROM NODE     15.00 TO NODE     15.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     15.00 TO NODE     16.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1514.88  DOWNSTREAM(FEET) =  1512.92
  FLOW LENGTH(FEET) =   161.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  29.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.66
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      99.24
  PIPE TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =   57.87
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     16.00 =    6888.00 FEET.

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

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   672.00
  UPSTREAM ELEVATION(FEET) =   1534.00
  DOWNSTREAM ELEVATION(FEET) =   1533.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  TC = 0.303*[(  672.00**3)/(     1.00)]**.2 =   15.066
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.495
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8794
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      1.72
  TOTAL AREA(ACRES) =      1.31   TOTAL RUNOFF(CFS) =      1.72
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1526.69  DOWNSTREAM(FEET) =  1520.80
  FLOW LENGTH(FEET) =  1228.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.54
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.72
  PIPE TRAVEL TIME(MIN.) =   5.78    Tc(MIN.) =   20.85
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =    1900.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   20.85
  RAINFALL INTENSITY(INCH/HR) =   1.32
  TOTAL STREAM AREA(ACRES) =     1.31
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.72

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    111.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   688.00
  UPSTREAM ELEVATION(FEET) =   1533.00
  DOWNSTREAM ELEVATION(FEET) =   1528.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  TC = 0.303*[(  688.00**3)/(     5.00)]**.2 =   11.075
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.681
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8812
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      1.78
  TOTAL AREA(ACRES) =      1.20   TOTAL RUNOFF(CFS) =      1.78

****************************************************************************
  FLOW PROCESS FROM NODE    111.00 TO NODE    102.00 IS CODE =  62
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1528.00  DOWNSTREAM ELEVATION(FEET) = 1524.00
  STREET LENGTH(FEET) =   566.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.47
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.36
    HALFSTREET FLOOD WIDTH(FEET) =   10.98
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.94
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.70
  STREET FLOW TRAVEL TIME(MIN.) =   4.86   Tc(MIN.) =   15.93
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.463
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8790
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    1.07      SUBAREA RUNOFF(CFS) =    1.38
  TOTAL AREA(ACRES) =        2.3        PEAK FLOW RATE(CFS) =       3.15

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.38   HALFSTREET FLOOD WIDTH(FEET) =  12.30
  FLOW VELOCITY(FEET/SEC.) =  2.04   DEPTH*VELOCITY(FT*FT/SEC.) =   0.78
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    102.00 =    1254.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.93
  RAINFALL INTENSITY(INCH/HR) =   1.46
  TOTAL STREAM AREA(ACRES) =     2.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.15

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
```

```
     1        1.72    20.85        1.321          1.31
     2        3.15    15.93        1.463          2.27

 ********************************WARNING*********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

  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        4.47    15.93       1.463
      2        4.57    20.85       1.321

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       4.47   Tc(MIN.) =   15.93
  TOTAL AREA(ACRES) =        3.6
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =    1900.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1520.80  DOWNSTREAM(FEET) =  1520.45
  FLOW LENGTH(FEET) =    51.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS  10.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.11
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.47
  PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =   16.10
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =    1951.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    120.00 TO NODE    121.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
```

```
        DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   944.00
  UPSTREAM ELEVATION(FEET) =   1533.00
  DOWNSTREAM ELEVATION(FEET) =   1526.00
  ELEVATION DIFFERENCE(FEET) =      7.00
  TC = 0.393*[(  944.00**3)/(     7.00)]**.2 =   16.215
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.453
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7946
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =     13.17
  TOTAL AREA(ACRES) =     11.40   TOTAL RUNOFF(CFS) =     13.17

****************************************************************************
  FLOW PROCESS FROM NODE    121.00 TO NODE    122.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1526.00  DOWNSTREAM ELEVATION(FEET) = 1525.50
  STREET LENGTH(FEET) =   626.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.08
    ***STREET FLOW SPLITS OVER STREET-CROWN***
    FULL DEPTH(FEET) =    0.70   FLOOD WIDTH(FEET) =   31.58
    FULL HALF-STREET VELOCITY(FEET/SEC.) =    1.16
    SPLIT DEPTH(FEET) =    0.62   SPLIT FLOOD WIDTH(FEET) =   25.82
    SPLIT FLOW(CFS) =    6.50   SPLIT VELOCITY(FEET/SEC.) =    1.06
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.70
    HALFSTREET FLOOD WIDTH(FEET) =   31.58
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.16
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.81
  STREET FLOW TRAVEL TIME(MIN.) =   8.99   Tc(MIN.) =   25.20
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.229
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7805
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    6.08      SUBAREA RUNOFF(CFS) =    5.83
  TOTAL AREA(ACRES) =       17.5        PEAK FLOW RATE(CFS) =      18.99
```

```
  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.70   HALFSTREET FLOOD WIDTH(FEET) =  31.58
  FLOW VELOCITY(FEET/SEC.) =  1.16   DEPTH*VELOCITY(FT*FT/SEC.) =   0.81
  LONGEST FLOWPATH FROM NODE    120.00 TO NODE    122.00 =    1570.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    122.00 TO NODE    122.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   25.20
  RAINFALL INTENSITY(INCH/HR) =   1.23
  TOTAL STREAM AREA(ACRES) =    17.48
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     18.99

****************************************************************************
  FLOW PROCESS FROM NODE    130.00 TO NODE    131.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   975.00
  UPSTREAM ELEVATION(FEET) =   1532.00
  DOWNSTREAM ELEVATION(FEET) =   1527.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  TC = 0.393*[(  975.00**3)/(     5.00)]**.2 =   17.683
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.406
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7919
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      6.69
  TOTAL AREA(ACRES) =      6.01   TOTAL RUNOFF(CFS) =      6.69

****************************************************************************
  FLOW PROCESS FROM NODE    131.00 TO NODE    122.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1527.00  DOWNSTREAM ELEVATION(FEET) = 1525.50
  STREET LENGTH(FEET) =   990.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018
```

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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      14.45
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.59
    HALFSTREET FLOOD WIDTH(FEET) =   23.71
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.39
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.81
  STREET FLOW TRAVEL TIME(MIN.) =  11.91   Tc(MIN.) =   29.59
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.156
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7750
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =   17.25      SUBAREA RUNOFF(CFS) =   15.45
  TOTAL AREA(ACRES) =       23.3        PEAK FLOW RATE(CFS) =      22.14

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.66   HALFSTREET FLOOD WIDTH(FEET) =  28.01
  FLOW VELOCITY(FEET/SEC.) =  1.54   DEPTH*VELOCITY(FT*FT/SEC.) =   1.02
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    122.00 =    1965.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    122.00 TO NODE    122.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   29.59
  RAINFALL INTENSITY(INCH/HR) =   1.16
  TOTAL STREAM AREA(ACRES) =    23.26
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     22.14

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       18.99    25.20        1.229         17.48
      2       22.14    29.59        1.156         23.26

 ********************************WARNING*********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

  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       37.86    25.20       1.229
      2       40.01    29.59       1.156

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      40.01   Tc(MIN.) =   29.59
  TOTAL AREA(ACRES) =       40.7
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    122.00 =    1965.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    122.00 TO NODE    103.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1525.50  DOWNSTREAM ELEVATION(FEET) = 1524.13
  STREET LENGTH(FEET) =   390.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      40.20
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.70
    HALFSTREET FLOOD WIDTH(FEET) =   31.61
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.43
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.70
  STREET FLOW TRAVEL TIME(MIN.) =   2.68   Tc(MIN.) =   32.26
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.118
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8744
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    0.39      SUBAREA RUNOFF(CFS) =    0.38
  TOTAL AREA(ACRES) =       41.1        PEAK FLOW RATE(CFS) =      40.39

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.70   HALFSTREET FLOOD WIDTH(FEET) =  31.61
  FLOW VELOCITY(FEET/SEC.) =  2.44   DEPTH*VELOCITY(FT*FT/SEC.) =   1.71
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    103.00 =    2355.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 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       40.39    32.26       1.118       41.13
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    103.00 =    2355.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        4.47    16.10       1.457        3.58
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =    1951.00 FEET.

 ****************************WARNING*********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ********************************************************************

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      24.62      16.10        1.457
      2      43.82      32.26        1.118

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      43.82   Tc(MIN.) =   32.26
  TOTAL AREA(ACRES) =       44.7

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    104.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1520.45  DOWNSTREAM(FEET) =  1517.99
  FLOW LENGTH(FEET) =   660.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  27.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.16
```

```
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      43.82
  PIPE TRAVEL TIME(MIN.) =   1.54    Tc(MIN.) =   33.80
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    104.00 =    3015.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   33.80
  RAINFALL INTENSITY(INCH/HR) =   1.10
  TOTAL STREAM AREA(ACRES) =    44.71
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     43.82

****************************************************************************
  FLOW PROCESS FROM NODE    140.00 TO NODE    141.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   986.00
  UPSTREAM ELEVATION(FEET) =   1526.00
  DOWNSTREAM ELEVATION(FEET) =   1524.60
  ELEVATION DIFFERENCE(FEET) =      1.40
  TC = 0.393*[(  986.00**3)/(     1.40)]**.2 =   22.964
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.273
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .7835
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      4.18
  TOTAL AREA(ACRES) =      4.19   TOTAL RUNOFF(CFS) =      4.18

****************************************************************************
  FLOW PROCESS FROM NODE    141.00 TO NODE    104.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1524.60  DOWNSTREAM ELEVATION(FEET) = 1521.49
  STREET LENGTH(FEET) =   774.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018
```

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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.88
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.46
    HALFSTREET FLOOD WIDTH(FEET) =   16.68
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.82
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.84
  STREET FLOW TRAVEL TIME(MIN.) =   7.08   Tc(MIN.) =   30.05
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.149
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8749
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    1.39      SUBAREA RUNOFF(CFS) =    1.40
  TOTAL AREA(ACRES) =        5.6        PEAK FLOW RATE(CFS) =       5.58

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.48   HALFSTREET FLOOD WIDTH(FEET) =  17.62
  FLOW VELOCITY(FEET/SEC.) =  1.88   DEPTH*VELOCITY(FT*FT/SEC.) =   0.90
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    104.00 =    1760.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   30.05
  RAINFALL INTENSITY(INCH/HR) =   1.15
  TOTAL STREAM AREA(ACRES) =     5.58
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.58

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       43.82    33.80        1.099         44.71
      2        5.58    30.05        1.149          5.58

 ********************************WARNING*********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

  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       44.53    30.05       1.149
      2       49.15    33.80       1.099

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      49.15   Tc(MIN.) =   33.80
  TOTAL AREA(ACRES) =       50.3
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    104.00 =    3015.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    105.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1517.99  DOWNSTREAM(FEET) =  1514.68
  FLOW LENGTH(FEET) =   267.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  22.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.60
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      49.15
  PIPE TRAVEL TIME(MIN.) =   0.38    Tc(MIN.) =   34.18
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    105.00 =    3282.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   34.18
  RAINFALL INTENSITY(INCH/HR) =   1.09
  TOTAL STREAM AREA(ACRES) =    50.29
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     49.15

****************************************************************************
  FLOW PROCESS FROM NODE    150.00 TO NODE    151.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
          DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   304.00
  UPSTREAM ELEVATION(FEET) =   1522.00
  DOWNSTREAM ELEVATION(FEET) =   1520.02
```

```
  ELEVATION DIFFERENCE(FEET) =      1.98
  TC = 0.303*[(  304.00**3)/(     1.98)]**.2 =    8.165
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.888
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8828
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      0.75
  TOTAL AREA(ACRES) =      0.45   TOTAL RUNOFF(CFS) =      0.75

****************************************************************************
  FLOW PROCESS FROM NODE    151.00 TO NODE    105.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1516.32  DOWNSTREAM(FEET) =  1514.68
  FLOW LENGTH(FEET) =    24.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   6.0 INCH PIPE IS   2.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.82
  ESTIMATED PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.75
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    8.22
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    105.00 =     328.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.22
  RAINFALL INTENSITY(INCH/HR) =   1.88
  TOTAL STREAM AREA(ACRES) =     0.45
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.75

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       49.15    34.18        1.094         50.29
      2        0.75     8.22        1.883          0.45

 ********************************WARNING*********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

  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       12.56     8.22       1.883
      2       49.59    34.18       1.094

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      49.59   Tc(MIN.) =   34.18
  TOTAL AREA(ACRES) =       50.7
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    105.00 =    3282.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE     16.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1514.68  DOWNSTREAM(FEET) =  1512.92
  FLOW LENGTH(FEET) =   324.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  28.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.35
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      49.59
  PIPE TRAVEL TIME(MIN.) =   0.65    Tc(MIN.) =   34.83
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE     16.00 =    3606.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.086
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8739
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    0.77   SUBAREA RUNOFF(CFS) =    0.73
  TOTAL AREA(ACRES) =       51.5   TOTAL RUNOFF(CFS) =      50.32
  TC(MIN.) =   34.83

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       50.32    34.83       1.086       51.51
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE     16.00 =    3606.00 FEET.
```

```
 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF       Tc       INTENSITY     AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
     1       99.24    57.87        0.895      134.39
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     16.00 =    6888.00 FEET.

 ****************************WARNING*********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ********************************************************************

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc       INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1     110.05      34.83        1.086
     2     140.71      57.87        0.895

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     140.71   Tc(MIN.) =   57.87
 TOTAL AREA(ACRES) =      185.9
================================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =      185.9  TC(MIN.) =     57.87
 PEAK FLOW RATE(CFS)   =     140.71
================================================================================
================================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
******************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
        RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                    (RCFC&WCD)  1978 HYDROLOGY MANUAL
         (c) Copyright 1982-2016 Advanced Engineering Software (aes)
                    (Rational Tabling Version 23.0)
                Release Date: 07/01/2016  License ID 1334

                          Analysis prepared by:
```

```
 ************************* DESCRIPTION OF STUDY *************************
* SP8950 SAN JACINTO                                                    *
* OFFSITE RUN-ON RATIONAL METHOD                                        *
* 100-YEAR STORM EVENT  PJ                                              *
 ************************************************************************

  FILE NAME: SJ100RO.DAT
  TIME/DATE OF STUDY: 06:30 09/07/2023
------------------------------------------------------------------------
  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
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  1.730
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.874
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  3.490
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.760
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.3810757
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.3820757
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.760
  SLOPE OF INTENSITY DURATION CURVE = 0.3821
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: COMPUTE CONFLUENCE VALUES ACCORDING TO RCFC&WCD HYDROLOGY MANUAL
        AND IGNORE OTHER CONFLUENCE COMBINATIONS FOR DOWNSTREAM ANALYSES
  *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     11.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   962.00
  UPSTREAM ELEVATION(FEET) =   1556.00
  DOWNSTREAM ELEVATION(FEET) =   1551.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  TC = 0.393*[(  962.00**3)/(     5.00)]**.2 =   17.541
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.816
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6743
  SOIL CLASSIFICATION IS "A"
  SUBAREA RUNOFF(CFS) =     10.18
  TOTAL AREA(ACRES) =      5.36   TOTAL RUNOFF(CFS) =     10.18

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     11.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.816
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .4486
  SOIL CLASSIFICATION IS "A"
  SUBAREA AREA(ACRES) =    0.48   SUBAREA RUNOFF(CFS) =    0.61
  TOTAL AREA(ACRES) =        5.8   TOTAL RUNOFF(CFS) =      10.78
  TC(MIN.) =   17.54

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     12.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1551.00  DOWNSTREAM ELEVATION(FEET) = 1535.00
  STREET LENGTH(FEET) =  2683.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018
```

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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      13.43
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.48
    HALFSTREET FLOOD WIDTH(FEET) =   17.54
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.28
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.09
  STREET FLOW TRAVEL TIME(MIN.) =  19.59   Tc(MIN.) =   37.13
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.114
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8844
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    2.83      SUBAREA RUNOFF(CFS) =    5.29
  TOTAL AREA(ACRES) =        8.7        PEAK FLOW RATE(CFS) =      16.07

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.50   HALFSTREET FLOOD WIDTH(FEET) =  18.87
  FLOW VELOCITY(FEET/SEC.) =  2.38   DEPTH*VELOCITY(FT*FT/SEC.) =   1.19
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     12.00 =    3645.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE     12.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.114
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7437
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    3.02   SUBAREA RUNOFF(CFS) =    4.75
  TOTAL AREA(ACRES) =       11.7   TOTAL RUNOFF(CFS) =      20.82
  TC(MIN.) =   37.13

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE     12.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.114
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .3846
  SOIL CLASSIFICATION IS "A"
  SUBAREA AREA(ACRES) =    2.19   SUBAREA RUNOFF(CFS) =    1.78
  TOTAL AREA(ACRES) =       13.9   TOTAL RUNOFF(CFS) =      22.60
  TC(MIN.) =   37.13

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE     12.00 IS CODE =  81
```

```
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.114
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .8218
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =   16.39   SUBAREA RUNOFF(CFS) =   28.48
  TOTAL AREA(ACRES) =       30.3   TOTAL RUNOFF(CFS) =      51.08
  TC(MIN.) =   37.13

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE     12.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.114
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .6423
  SOIL CLASSIFICATION IS "A"
  SUBAREA AREA(ACRES) =    7.89   SUBAREA RUNOFF(CFS) =   10.71
  TOTAL AREA(ACRES) =       38.2   TOTAL RUNOFF(CFS) =      61.80
  TC(MIN.) =   37.13

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE     12.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   37.13
  RAINFALL INTENSITY(INCH/HR) =   2.11
  TOTAL STREAM AREA(ACRES) =    38.16
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     61.80

****************************************************************************
  FLOW PROCESS FROM NODE     20.00 TO NODE     21.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   972.00
  UPSTREAM ELEVATION(FEET) =   1536.50
  DOWNSTREAM ELEVATION(FEET) =   1536.00
  ELEVATION DIFFERENCE(FEET) =      0.50
  TC = 0.393*[(  972.00**3)/(     0.50)]**.2 =   27.974
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.356
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .8286
  SOIL CLASSIFICATION IS "D"
```

```
  SUBAREA RUNOFF(CFS) =      9.95
  TOTAL AREA(ACRES) =      5.10   TOTAL RUNOFF(CFS) =      9.95

****************************************************************************
  FLOW PROCESS FROM NODE     21.00 TO NODE     12.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1536.00  DOWNSTREAM ELEVATION(FEET) = 1535.00
  STREET LENGTH(FEET) =   238.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      15.57
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.52
    HALFSTREET FLOOD WIDTH(FEET) =   19.96
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.07
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.08
  STREET FLOW TRAVEL TIME(MIN.) =   1.91   Tc(MIN.) =   29.89
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.297
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .8270
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    5.91      SUBAREA RUNOFF(CFS) =   11.23
  TOTAL AREA(ACRES) =       11.0        PEAK FLOW RATE(CFS) =      21.18

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.57   HALFSTREET FLOOD WIDTH(FEET) =  22.62
  FLOW VELOCITY(FEET/SEC.) =  2.22   DEPTH*VELOCITY(FT*FT/SEC.) =   1.26
  LONGEST FLOWPATH FROM NODE     20.00 TO NODE     12.00 =    1210.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE     12.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   29.89
  RAINFALL INTENSITY(INCH/HR) =   2.30
```

```
 TOTAL STREAM AREA(ACRES) =    11.01
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     21.18

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       61.80    37.13        2.114         38.16
     2       21.18    29.89        2.297         11.01

 ********************************WARNING*********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

 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       70.92    29.89       2.297
     2       81.29    37.13       2.114

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      81.29   Tc(MIN.) =   37.13
 TOTAL AREA(ACRES) =       49.2
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     12.00 =    3645.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     12.00 TO NODE     13.00 IS CODE =  62
----------------------------------------------------------------------------
 >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
 UPSTREAM ELEVATION(FEET) = 1535.00  DOWNSTREAM ELEVATION(FEET) = 1526.00
 STREET LENGTH(FEET) =  1584.00   CURB HEIGHT(INCHES) =  8.0
 STREET HALFWIDTH(FEET) = 30.00

 DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
 INSIDE STREET CROSSFALL(DECIMAL) =  0.018
 OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

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

   **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      84.34
   ***STREET FLOWING FULL***
```

```
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.79
    HALFSTREET FLOOD WIDTH(FEET) =   36.31
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.68
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.92
  STREET FLOW TRAVEL TIME(MIN.) =   7.18   Tc(MIN.) =   44.31
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.976
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8835
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    3.49      SUBAREA RUNOFF(CFS) =    6.09
  TOTAL AREA(ACRES) =       52.7        PEAK FLOW RATE(CFS) =      87.39

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.80   HALFSTREET FLOOD WIDTH(FEET) =  36.68
  FLOW VELOCITY(FEET/SEC.) =  3.72   DEPTH*VELOCITY(FT*FT/SEC.) =   2.98
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     13.00 =    5229.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.976
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7348
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    2.75   SUBAREA RUNOFF(CFS) =    3.99
  TOTAL AREA(ACRES) =       55.4   TOTAL RUNOFF(CFS) =      91.38
  TC(MIN.) =   44.31

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.976
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7348
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    5.33   SUBAREA RUNOFF(CFS) =    7.74
  TOTAL AREA(ACRES) =       60.7   TOTAL RUNOFF(CFS) =      99.12
  TC(MIN.) =   44.31

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.976
  APARTMENT DEVELOPMENT RUNOFF COEFFICIENT = .8670
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    2.23   SUBAREA RUNOFF(CFS) =    3.82
```

```
  TOTAL AREA(ACRES) =       63.0   TOTAL RUNOFF(CFS) =     102.94
  TC(MIN.) =   44.31

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.976
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .8174
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =   10.26   SUBAREA RUNOFF(CFS) =   16.57
  TOTAL AREA(ACRES) =       73.2   TOTAL RUNOFF(CFS) =     119.51
  TC(MIN.) =   44.31

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   44.31
  RAINFALL INTENSITY(INCH/HR) =   1.98
  TOTAL STREAM AREA(ACRES) =    73.23
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    119.51

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE     31.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   978.00
  UPSTREAM ELEVATION(FEET) =   1533.00
  DOWNSTREAM ELEVATION(FEET) =   1532.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  TC = 0.393*[(  978.00**3)/(     1.00)]**.2 =   24.443
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.480
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .8316
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =     12.54
  TOTAL AREA(ACRES) =      6.08   TOTAL RUNOFF(CFS) =     12.54

****************************************************************************
  FLOW PROCESS FROM NODE     31.00 TO NODE     13.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
================================================================================
  UPSTREAM ELEVATION(FEET) = 1532.00  DOWNSTREAM ELEVATION(FEET) = 1526.00
  STREET LENGTH(FEET) =  2198.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      22.69
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.61
    HALFSTREET FLOOD WIDTH(FEET) =   25.27
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.92
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.18
  STREET FLOW TRAVEL TIME(MIN.) =  19.04   Tc(MIN.) =   43.48
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.990
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .8179
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =   12.41      SUBAREA RUNOFF(CFS) =   20.20
  TOTAL AREA(ACRES) =       18.5        PEAK FLOW RATE(CFS) =      32.74

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.68   HALFSTREET FLOOD WIDTH(FEET) =  29.88
  FLOW VELOCITY(FEET/SEC.) =  2.11   DEPTH*VELOCITY(FT*FT/SEC.) =   1.44
  LONGEST FLOWPATH FROM NODE     30.00 TO NODE     13.00 =    3176.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     13.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   43.48
  RAINFALL INTENSITY(INCH/HR) =   1.99
  TOTAL STREAM AREA(ACRES) =    18.49
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     32.74

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      119.51    44.31        1.976         73.23
```

```
     2       32.74    43.48        1.990         18.49

 ********************************WARNING*********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

  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      150.03    43.48       1.990
      2      152.02    44.31       1.976

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     152.02   Tc(MIN.) =   44.31
  TOTAL AREA(ACRES) =       91.7
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     13.00 =    5229.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     14.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1526.00  DOWNSTREAM ELEVATION(FEET) = 1522.00
  STREET LENGTH(FEET) =   914.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     153.03
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.98
    HALFSTREET FLOOD WIDTH(FEET) =   45.71
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.99
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    3.91
  STREET FLOW TRAVEL TIME(MIN.) =   3.82   Tc(MIN.) =   48.13
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.915
```

```
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8830
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    1.19      SUBAREA RUNOFF(CFS) =    2.01
  TOTAL AREA(ACRES) =       92.9        PEAK FLOW RATE(CFS) =     154.03

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.98   HALFSTREET FLOOD WIDTH(FEET) =  45.83
  FLOW VELOCITY(FEET/SEC.) =  3.99   DEPTH*VELOCITY(FT*FT/SEC.) =   3.93
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     14.00 =    6143.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     14.00 TO NODE     14.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.915
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7304
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    1.81   SUBAREA RUNOFF(CFS) =    2.53
  TOTAL AREA(ACRES) =       94.7   TOTAL RUNOFF(CFS) =     156.56
  TC(MIN.) =   48.13

****************************************************************************
  FLOW PROCESS FROM NODE     14.00 TO NODE     14.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   48.13
  RAINFALL INTENSITY(INCH/HR) =   1.91
  TOTAL STREAM AREA(ACRES) =    94.72
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    156.56

****************************************************************************
  FLOW PROCESS FROM NODE     40.00 TO NODE     41.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   811.00
  UPSTREAM ELEVATION(FEET) =   1532.00
  DOWNSTREAM ELEVATION(FEET) =   1526.00
  ELEVATION DIFFERENCE(FEET) =      6.00
  TC = 0.303*[(  811.00**3)/(     6.00)]**.2 =   11.786
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.278
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8893
  SOIL CLASSIFICATION IS "D"
```

```
  SUBAREA RUNOFF(CFS) =     15.42
  TOTAL AREA(ACRES) =      5.29   TOTAL RUNOFF(CFS) =     15.42

****************************************************************************
  FLOW PROCESS FROM NODE     41.00 TO NODE     14.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1526.00  DOWNSTREAM ELEVATION(FEET) = 1522.00
  STREET LENGTH(FEET) =  1354.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      16.99
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.68
    HALFSTREET FLOOD WIDTH(FEET) =   29.88
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.19
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.49
  STREET FLOW TRAVEL TIME(MIN.) =  10.31   Tc(MIN.) =   22.10
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.578
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8868
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    1.37      SUBAREA RUNOFF(CFS) =    3.13
  TOTAL AREA(ACRES) =        6.7        PEAK FLOW RATE(CFS) =      18.55

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.70   HALFSTREET FLOOD WIDTH(FEET) =  31.58
  FLOW VELOCITY(FEET/SEC.) =  2.23   DEPTH*VELOCITY(FT*FT/SEC.) =   1.56
  LONGEST FLOWPATH FROM NODE     40.00 TO NODE     14.00 =    2165.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     14.00 TO NODE     14.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.578
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7676
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    8.99   SUBAREA RUNOFF(CFS) =   17.79
  TOTAL AREA(ACRES) =       15.6   TOTAL RUNOFF(CFS) =      36.34
```

```
  TC(MIN.) =   22.10

****************************************************************************
  FLOW PROCESS FROM NODE     14.00 TO NODE     14.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   22.10
  RAINFALL INTENSITY(INCH/HR) =   2.58
  TOTAL STREAM AREA(ACRES) =    15.65
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     36.34

****************************************************************************
  FLOW PROCESS FROM NODE     50.00 TO NODE     14.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   897.00
  UPSTREAM ELEVATION(FEET) =   1527.00
  DOWNSTREAM ELEVATION(FEET) =   1522.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  TC = 0.533*[(  897.00**3)/(     5.00)]**.2 =   22.818
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.546
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7663
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =     16.53
  TOTAL AREA(ACRES) =      8.47   TOTAL RUNOFF(CFS) =     16.53

****************************************************************************
  FLOW PROCESS FROM NODE     14.00 TO NODE     14.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =   22.82
  RAINFALL INTENSITY(INCH/HR) =   2.55
  TOTAL STREAM AREA(ACRES) =     8.47
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     16.53

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      156.56    48.13        1.915         94.72
```

```
     2       36.34    22.10        2.578         15.65
     3       16.53    22.82        2.546          8.47

 ********************************WARNING*********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1      124.24    22.10       2.578
      2      126.66    22.82       2.546
      3      195.98    48.13       1.915

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     195.98   Tc(MIN.) =   48.13
  TOTAL AREA(ACRES) =      118.8
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     14.00 =    6143.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     14.00 TO NODE     15.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1522.00  DOWNSTREAM ELEVATION(FEET) = 1518.06
  STREET LENGTH(FEET) =   584.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     196.85
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.99
    HALFSTREET FLOOD WIDTH(FEET) =   46.26
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    5.00
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    4.96
```

```
  STREET FLOW TRAVEL TIME(MIN.) =   1.95   Tc(MIN.) =   50.07
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.886
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8828
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    1.04      SUBAREA RUNOFF(CFS) =    1.73
  TOTAL AREA(ACRES) =      119.9        PEAK FLOW RATE(CFS) =     197.71

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.99   HALFSTREET FLOOD WIDTH(FEET) =  46.32
  FLOW VELOCITY(FEET/SEC.) =  5.01   DEPTH*VELOCITY(FT*FT/SEC.) =   4.97
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     15.00 =    6727.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     15.00 TO NODE     15.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     60.00 TO NODE     61.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   292.00
  UPSTREAM ELEVATION(FEET) =   1526.20
  DOWNSTREAM ELEVATION(FEET) =   1522.29
  ELEVATION DIFFERENCE(FEET) =      3.91
  TC = 0.303*[(  292.00**3)/(     3.91)]**.2 =    6.956
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.009
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8910
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =     11.79
  TOTAL AREA(ACRES) =      3.30   TOTAL RUNOFF(CFS) =     11.79

****************************************************************************
  FLOW PROCESS FROM NODE     61.00 TO NODE     62.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1519.20  DOWNSTREAM(FEET) =  1518.20
  FLOW LENGTH(FEET) =   430.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.35
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.79
  PIPE TRAVEL TIME(MIN.) =   1.65    Tc(MIN.) =    8.61
```

```
 LONGEST FLOWPATH FROM NODE     60.00 TO NODE     62.00 =     722.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     62.00 TO NODE     62.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =    8.61
 RAINFALL INTENSITY(INCH/HR) =   3.70
 TOTAL STREAM AREA(ACRES) =     3.30
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.79

****************************************************************************
 FLOW PROCESS FROM NODE     70.00 TO NODE     62.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS COMMERCIAL
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   452.00
 UPSTREAM ELEVATION(FEET) =   1526.20
 DOWNSTREAM ELEVATION(FEET) =   1520.20
 ELEVATION DIFFERENCE(FEET) =      6.00
 TC = 0.303*[(  452.00**3)/(     6.00)]**.2 =    8.299
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.748
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8905
 SOIL CLASSIFICATION IS "D"
 SUBAREA RUNOFF(CFS) =     20.72
 TOTAL AREA(ACRES) =      6.21   TOTAL RUNOFF(CFS) =     20.72

****************************************************************************
 FLOW PROCESS FROM NODE     62.00 TO NODE     62.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    8.30
 RAINFALL INTENSITY(INCH/HR) =   3.75
 TOTAL STREAM AREA(ACRES) =     6.21
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     20.72

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       11.79     8.61        3.696          3.30
```

```
     2       20.72     8.30        3.748          6.21

 ********************************WARNING*********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

  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       32.09     8.30       3.748
      2       32.23     8.61       3.696

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      32.09   Tc(MIN.) =    8.30
  TOTAL AREA(ACRES) =        9.5
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     62.00 =     722.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     62.00 TO NODE     63.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1518.20  DOWNSTREAM(FEET) =  1515.88
  FLOW LENGTH(FEET) =   433.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  22.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.61
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      32.09
  PIPE TRAVEL TIME(MIN.) =   0.95    Tc(MIN.) =    9.25
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     63.00 =    1155.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     63.00 TO NODE     63.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.25
  RAINFALL INTENSITY(INCH/HR) =   3.60
  TOTAL STREAM AREA(ACRES) =     9.51
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     32.09

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

```
 FLOW PROCESS FROM NODE     80.00 TO NODE     63.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS COMMERCIAL
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   407.00
 UPSTREAM ELEVATION(FEET) =   1523.79
 DOWNSTREAM ELEVATION(FEET) =   1517.83
 ELEVATION DIFFERENCE(FEET) =      5.96
 TC = 0.303*[(  407.00**3)/(     5.96)]**.2 =    7.804
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.837
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8907
 SOIL CLASSIFICATION IS "D"
 SUBAREA RUNOFF(CFS) =     17.09
 TOTAL AREA(ACRES) =      5.00   TOTAL RUNOFF(CFS) =     17.09

****************************************************************************
 FLOW PROCESS FROM NODE     63.00 TO NODE     63.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    7.80
 RAINFALL INTENSITY(INCH/HR) =   3.84
 TOTAL STREAM AREA(ACRES) =     5.00
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     17.09

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       32.09     9.25        3.596          9.51
     2       17.09     7.80        3.837          5.00

 ********************************WARNING*********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

 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       44.17     7.80       3.837
```

```
     2       48.11     9.25       3.596

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      48.11   Tc(MIN.) =    9.25
  TOTAL AREA(ACRES) =       14.5
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     63.00 =    1155.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     63.00 TO NODE     15.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1515.88  DOWNSTREAM(FEET) =  1514.88
  FLOW LENGTH(FEET) =   207.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  36.0 INCH PIPE IS  29.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.89
  ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      48.11
  PIPE TRAVEL TIME(MIN.) =   0.44    Tc(MIN.) =    9.68
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     15.00 =    1362.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     15.00 TO NODE     15.00 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       48.11     9.68       3.533       14.51
  LONGEST FLOWPATH FROM NODE     60.00 TO NODE     15.00 =    1362.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF       Tc       INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1      197.71    50.07       1.886      119.88
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     15.00 =    6727.00 FEET.

 ****************************WARNING*************************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc       INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      86.34       9.68       3.533
```

```
      2     223.39      50.07        1.886

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     223.39   Tc(MIN.) =   50.07
  TOTAL AREA(ACRES) =      134.4

****************************************************************************
  FLOW PROCESS FROM NODE     15.00 TO NODE     15.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     15.00 TO NODE     16.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1514.88  DOWNSTREAM(FEET) =  1512.92
  FLOW LENGTH(FEET) =   161.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  54.0 INCH PIPE IS  43.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  16.41
  ESTIMATED PIPE DIAMETER(INCH) =  54.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     223.39
  PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =   50.24
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     16.00 =    6888.00 FEET.

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

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   672.00
  UPSTREAM ELEVATION(FEET) =   1534.00
  DOWNSTREAM ELEVATION(FEET) =   1533.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  TC = 0.303*[(  672.00**3)/(     1.00)]**.2 =   15.066
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.984
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8883
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      3.47
```

```
  TOTAL AREA(ACRES) =      1.31   TOTAL RUNOFF(CFS) =      3.47

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    102.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1526.69  DOWNSTREAM(FEET) =  1520.80
  FLOW LENGTH(FEET) =  1228.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   9.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.21
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.47
  PIPE TRAVEL TIME(MIN.) =   4.86    Tc(MIN.) =   19.93
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =    1900.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   19.93
  RAINFALL INTENSITY(INCH/HR) =   2.68
  TOTAL STREAM AREA(ACRES) =     1.31
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.47

****************************************************************************
  FLOW PROCESS FROM NODE    110.00 TO NODE    111.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   688.00
  UPSTREAM ELEVATION(FEET) =   1533.00
  DOWNSTREAM ELEVATION(FEET) =   1528.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  TC = 0.303*[(  688.00**3)/(     5.00)]**.2 =   11.075
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.356
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8895
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      3.58
  TOTAL AREA(ACRES) =      1.20   TOTAL RUNOFF(CFS) =      3.58

****************************************************************************
  FLOW PROCESS FROM NODE    111.00 TO NODE    102.00 IS CODE =  62
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1528.00  DOWNSTREAM ELEVATION(FEET) = 1524.00
  STREET LENGTH(FEET) =   566.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.00
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.43
    HALFSTREET FLOOD WIDTH(FEET) =   14.96
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.28
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    0.98
  STREET FLOW TRAVEL TIME(MIN.) =   4.14   Tc(MIN.) =   15.21
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.973
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8883
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    1.07      SUBAREA RUNOFF(CFS) =    2.83
  TOTAL AREA(ACRES) =        2.3        PEAK FLOW RATE(CFS) =       6.41

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.46   HALFSTREET FLOOD WIDTH(FEET) =  16.60
  FLOW VELOCITY(FEET/SEC.) =  2.41   DEPTH*VELOCITY(FT*FT/SEC.) =   1.11
  LONGEST FLOWPATH FROM NODE    110.00 TO NODE    102.00 =    1254.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    102.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.21
  RAINFALL INTENSITY(INCH/HR) =   2.97
  TOTAL STREAM AREA(ACRES) =     2.27
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.41

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
```

```
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        3.47    19.93        2.682          1.31
      2        6.41    15.21        2.973          2.27

 ********************************WARNING*********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ************************************************************************

  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        9.06    15.21       2.973
      2        9.25    19.93       2.682

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       9.06   Tc(MIN.) =   15.21
  TOTAL AREA(ACRES) =        3.6
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    102.00 =    1900.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    102.00 TO NODE    103.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1520.80  DOWNSTREAM(FEET) =  1520.45
  FLOW LENGTH(FEET) =    51.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.92
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.06
  PIPE TRAVEL TIME(MIN.) =   0.14    Tc(MIN.) =   15.36
  LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =    1951.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    120.00 TO NODE    121.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
```

```
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   944.00
  UPSTREAM ELEVATION(FEET) =   1533.00
  DOWNSTREAM ELEVATION(FEET) =   1526.00
  ELEVATION DIFFERENCE(FEET) =      7.00
  TC = 0.393*[(  944.00**3)/(     7.00)]**.2 =   16.215
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.901
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .8402
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =     27.79
  TOTAL AREA(ACRES) =     11.40   TOTAL RUNOFF(CFS) =     27.79

****************************************************************************
  FLOW PROCESS FROM NODE    121.00 TO NODE    122.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1526.00  DOWNSTREAM ELEVATION(FEET) = 1525.50
  STREET LENGTH(FEET) =   626.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      34.16
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.81
    HALFSTREET FLOOD WIDTH(FEET) =   37.17
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.41
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.14
  STREET FLOW TRAVEL TIME(MIN.) =   7.39   Tc(MIN.) =   23.60
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.514
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .8324
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    6.08      SUBAREA RUNOFF(CFS) =   12.72
  TOTAL AREA(ACRES) =       17.5        PEAK FLOW RATE(CFS) =      40.51

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.85   HALFSTREET FLOOD WIDTH(FEET) =  39.12
  FLOW VELOCITY(FEET/SEC.) =  1.49   DEPTH*VELOCITY(FT*FT/SEC.) =   1.27
```

```
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  626.0 FT WITH ELEVATION-DROP =   0.5 FT, IS   13.2 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    122.00
  LONGEST FLOWPATH FROM NODE    120.00 TO NODE    122.00 =    1570.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    122.00 TO NODE    122.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   23.60
  RAINFALL INTENSITY(INCH/HR) =   2.51
  TOTAL STREAM AREA(ACRES) =    17.48
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     40.51

****************************************************************************
  FLOW PROCESS FROM NODE    130.00 TO NODE    131.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   975.00
  UPSTREAM ELEVATION(FEET) =   1532.00
  DOWNSTREAM ELEVATION(FEET) =   1527.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  TC = 0.393*[(  975.00**3)/(     5.00)]**.2 =   17.683
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.807
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .8385
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =     14.15
  TOTAL AREA(ACRES) =      6.01   TOTAL RUNOFF(CFS) =     14.15

****************************************************************************
  FLOW PROCESS FROM NODE    131.00 TO NODE    122.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1527.00  DOWNSTREAM ELEVATION(FEET) = 1525.50
  STREET LENGTH(FEET) =   990.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018
```

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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      31.21
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.73
    HALFSTREET FLOOD WIDTH(FEET) =   33.02
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    1.70
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.24
  STREET FLOW TRAVEL TIME(MIN.) =   9.71   Tc(MIN.) =   27.39
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.375
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .8291
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =   17.25      SUBAREA RUNOFF(CFS) =   33.96
  TOTAL AREA(ACRES) =       23.3        PEAK FLOW RATE(CFS) =      48.11

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.81   HALFSTREET FLOOD WIDTH(FEET) =  37.41
  FLOW VELOCITY(FEET/SEC.) =  1.96   DEPTH*VELOCITY(FT*FT/SEC.) =   1.60
  *NOTE: INITIAL SUBAREA NOMOGRAPH WITH SUBAREA PARAMETERS,
         AND L =  990.0 FT WITH ELEVATION-DROP =   1.5 FT, IS   36.7 CFS,
         WHICH EXCEEDS THE TOP-OF-CURB STREET CAPACITY AT NODE    122.00
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    122.00 =    1965.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    122.00 TO NODE    122.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   27.39
  RAINFALL INTENSITY(INCH/HR) =   2.37
  TOTAL STREAM AREA(ACRES) =    23.26
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     48.11

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       40.51    23.60        2.514         17.48
      2       48.11    27.39        2.375         23.26

 ********************************WARNING*********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
```

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

  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       81.97    23.60       2.514
      2       86.38    27.39       2.375

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      86.38   Tc(MIN.) =   27.39
  TOTAL AREA(ACRES) =       40.7
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    122.00 =    1965.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    122.00 TO NODE    103.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1525.50  DOWNSTREAM ELEVATION(FEET) = 1524.13
  STREET LENGTH(FEET) =   390.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00

  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      86.78
    ***STREET FLOWING FULL***
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.86
    HALFSTREET FLOOD WIDTH(FEET) =   39.43
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    3.14
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    2.68
  STREET FLOW TRAVEL TIME(MIN.) =   2.07   Tc(MIN.) =   29.46
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.310
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8855
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    0.39      SUBAREA RUNOFF(CFS) =    0.80
  TOTAL AREA(ACRES) =       41.1        PEAK FLOW RATE(CFS) =      87.18

  END OF SUBAREA STREET FLOW HYDRAULICS:
```

```
 DEPTH(FEET) = 0.86   HALFSTREET FLOOD WIDTH(FEET) =  39.43
 FLOW VELOCITY(FEET/SEC.) =  3.15   DEPTH*VELOCITY(FT*FT/SEC.) =   2.70
 LONGEST FLOWPATH FROM NODE    130.00 TO NODE    103.00 =    2355.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 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       87.18    29.46        2.310       41.13
 LONGEST FLOWPATH FROM NODE    130.00 TO NODE    103.00 =    2355.00 FEET.

 ** MEMORY BANK #  2 CONFLUENCE DATA **
 STREAM     RUNOFF       Tc       INTENSITY     AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
     1        9.06    15.36        2.962        3.58
 LONGEST FLOWPATH FROM NODE    100.00 TO NODE    103.00 =    1951.00 FEET.

 ****************************WARNING*****************************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
 ****************************************************************************

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc       INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1      54.50      15.36        2.962
     2      94.24      29.46        2.310

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      94.24   Tc(MIN.) =   29.46
 TOTAL AREA(ACRES) =       44.7

****************************************************************************
 FLOW PROCESS FROM NODE    103.00 TO NODE    103.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE    103.00 TO NODE    104.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
```

```
  ELEVATION DATA: UPSTREAM(FEET) =  1520.45  DOWNSTREAM(FEET) =  1517.99
  FLOW LENGTH(FEET) =   660.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  51.0 INCH PIPE IS  36.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.63
  ESTIMATED PIPE DIAMETER(INCH) =  51.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      94.24
  PIPE TRAVEL TIME(MIN.) =   1.27    Tc(MIN.) =   30.74
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    104.00 =    3015.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   30.74
  RAINFALL INTENSITY(INCH/HR) =   2.27
  TOTAL STREAM AREA(ACRES) =    44.71
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     94.24

****************************************************************************
  FLOW PROCESS FROM NODE    140.00 TO NODE    141.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS SINGLE FAMILY (1/4 ACRE)
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   986.00
  UPSTREAM ELEVATION(FEET) =   1526.00
  DOWNSTREAM ELEVATION(FEET) =   1524.60
  ELEVATION DIFFERENCE(FEET) =      1.40
  TC = 0.393*[(  986.00**3)/(     1.40)]**.2 =   22.964
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.540
  SINGLE-FAMILY(1/4 ACRE LOT) RUNOFF COEFFICIENT = .8330
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      8.87
  TOTAL AREA(ACRES) =      4.19   TOTAL RUNOFF(CFS) =      8.87

****************************************************************************
  FLOW PROCESS FROM NODE    141.00 TO NODE    104.00 IS CODE =  62
----------------------------------------------------------------------------
  >>>>>COMPUTE STREET FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>(STREET TABLE SECTION #  1 USED)<<<<<
============================================================================
  UPSTREAM ELEVATION(FEET) = 1524.60  DOWNSTREAM ELEVATION(FEET) = 1521.49
  STREET LENGTH(FEET) =   774.00   CURB HEIGHT(INCHES) =  8.0
  STREET HALFWIDTH(FEET) = 30.00
```

```
  DISTANCE FROM CROWN TO CROSSFALL GRADEBREAK(FEET) =  20.00
  INSIDE STREET CROSSFALL(DECIMAL) =  0.018
  OUTSIDE STREET CROSSFALL(DECIMAL)  =  0.018

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

    **TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      10.30
    STREETFLOW MODEL RESULTS USING ESTIMATED FLOW:
    STREET FLOW DEPTH(FEET) =  0.57
    HALFSTREET FLOOD WIDTH(FEET) =   22.54
    AVERAGE FLOW VELOCITY(FEET/SEC.) =    2.18
    PRODUCT OF DEPTH&VELOCITY(FT*FT/SEC.) =    1.23
  STREET FLOW TRAVEL TIME(MIN.) =   5.93   Tc(MIN.) =   28.89
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.327
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8856
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    1.39      SUBAREA RUNOFF(CFS) =    2.86
  TOTAL AREA(ACRES) =        5.6        PEAK FLOW RATE(CFS) =      11.73

  END OF SUBAREA STREET FLOW HYDRAULICS:
  DEPTH(FEET) = 0.59   HALFSTREET FLOOD WIDTH(FEET) =  23.71
  FLOW VELOCITY(FEET/SEC.) =  2.25   DEPTH*VELOCITY(FT*FT/SEC.) =   1.32
  LONGEST FLOWPATH FROM NODE    140.00 TO NODE    104.00 =    1760.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    104.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   28.89
  RAINFALL INTENSITY(INCH/HR) =   2.33
  TOTAL STREAM AREA(ACRES) =     5.58
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.73

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       94.24    30.74        2.272         44.71
      2       11.73    28.89        2.327          5.58

 ********************************WARNING*********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
```

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

  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      100.30    28.89       2.327
      2      105.70    30.74       2.272

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     105.70   Tc(MIN.) =   30.74
  TOTAL AREA(ACRES) =       50.3
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    104.00 =    3015.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    104.00 TO NODE    105.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1517.99  DOWNSTREAM(FEET) =  1514.68
  FLOW LENGTH(FEET) =   267.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  31.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.89
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     105.70
  PIPE TRAVEL TIME(MIN.) =   0.32    Tc(MIN.) =   31.06
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    105.00 =    3282.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   31.06
  RAINFALL INTENSITY(INCH/HR) =   2.26
  TOTAL STREAM AREA(ACRES) =    50.29
  PEAK FLOW RATE(CFS) AT CONFLUENCE =    105.70

****************************************************************************
  FLOW PROCESS FROM NODE    150.00 TO NODE    151.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
          DEVELOPMENT IS COMMERCIAL
```

```
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   304.00
  UPSTREAM ELEVATION(FEET) =   1522.00
  DOWNSTREAM ELEVATION(FEET) =   1520.02
  ELEVATION DIFFERENCE(FEET) =      1.98
  TC = 0.303*[(  304.00**3)/(     1.98)]**.2 =    8.165
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.771
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8905
  SOIL CLASSIFICATION IS "D"
  SUBAREA RUNOFF(CFS) =      1.51
  TOTAL AREA(ACRES) =      0.45   TOTAL RUNOFF(CFS) =      1.51

****************************************************************************
  FLOW PROCESS FROM NODE    151.00 TO NODE    105.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1516.32  DOWNSTREAM(FEET) =  1514.68
  FLOW LENGTH(FEET) =    24.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   6.0 INCH PIPE IS   4.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.99
  ESTIMATED PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.51
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =    8.21
  LONGEST FLOWPATH FROM NODE    150.00 TO NODE    105.00 =     328.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE    105.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.21
  RAINFALL INTENSITY(INCH/HR) =   3.76
  TOTAL STREAM AREA(ACRES) =     0.45
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.51

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1      105.70    31.06        2.263         50.29
      2        1.51     8.21        3.763          0.45

 ********************************WARNING*********************************
  IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
  ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
  WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
```

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

  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       29.45     8.21       3.763
      2      106.61    31.06       2.263

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =     106.61   Tc(MIN.) =   31.06
  TOTAL AREA(ACRES) =       50.7
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE    105.00 =    3282.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    105.00 TO NODE     16.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  ELEVATION DATA: UPSTREAM(FEET) =  1514.68  DOWNSTREAM(FEET) =  1512.92
  FLOW LENGTH(FEET) =   324.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  48.0 INCH PIPE IS  37.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.12
  ESTIMATED PIPE DIAMETER(INCH) =  48.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     106.61
  PIPE TRAVEL TIME(MIN.) =   0.53    Tc(MIN.) =   31.59
  LONGEST FLOWPATH FROM NODE    130.00 TO NODE     16.00 =    3606.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.249
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8851
  SOIL CLASSIFICATION IS "D"
  SUBAREA AREA(ACRES) =    0.77   SUBAREA RUNOFF(CFS) =    1.53
  TOTAL AREA(ACRES) =       51.5   TOTAL RUNOFF(CFS) =     108.14
  TC(MIN.) =   31.59

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     16.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
```

```
 STREAM     RUNOFF       Tc       INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1      108.14    31.59       2.249       51.51
 LONGEST FLOWPATH FROM NODE    130.00 TO NODE     16.00 =    3606.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF       Tc       INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1      223.39    50.24       1.884      134.39
 LONGEST FLOWPATH FROM NODE     10.00 TO NODE     16.00 =    6888.00 FEET.

****************************WARNING*********************************
 IN THIS COMPUTER PROGRAM, THE CONFLUENCE VALUE USED IS BASED
 ON THE RCFC&WCD FORMULA OF PLATE D-1 AS DEFAULT VALUE. THIS FORMULA
 WILL NOT NECESSARILY RESULT IN THE MAXIMUM VALUE OF PEAK FLOW.
********************************************************************

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc       INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1     248.62      31.59        2.249
     2     313.97      50.24        1.884

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     313.97   Tc(MIN.) =   50.24
 TOTAL AREA(ACRES) =      185.9
================================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =      185.9  TC(MIN.) =     50.24
 PEAK FLOW RATE(CFS)   =     313.97
================================================================================
================================================================================
 END OF RATIONAL METHOD ANALYSIS
```

Appendix H – WSPG Calculations and Profiles

```
T1 SAN JACINTO                                                                0

T2 PROPOSED LINE H-2 EXTENSION

T3 10-YEAR STORM EVENT

SO   1000.0001513.290  1                          1516.000

R    1004.7201513.310  1      .013                                .000    .000 0

R    1015.6601513.350  1      .013                              51.169    .000 0

R    1061.0101513.470  1      .013                                .000    .000 0

R    1100.0801513.590  1      .013                             -97.881    .000 0

R    1125.0301513.660  1      .013                                .000    .000 0

JX   1131.0301513.690  3  2   .013     .810         1513.660        -45.0
.000
R    1195.1101513.870  3      .013                                .000    .000 0

JX   1201.1101513.890  5  4   .013   23.610         1513.870        -45.0
.000
R    1586.0601515.040  5      .013                                .000    .000 0

R    1602.3301515.094  7      .013                                .000    .000 0

SH   1602.3301515.094  7                          1515.094

CD   1  4   1    .000   4.000     .000  .000  .000   .00

CD   2  4   1    .000   2.000     .000  .000  .000   .00

CD   3  4   1    .000   4.000     .000  .000  .000   .00

CD   4  4   1    .000   2.500     .000  .000  .000   .00

CD   5  4   1    .000   4.000     .000  .000  .000   .00

CD   7  4   1    .000   4.000     .000  .000  .000   .00

Q            86.340   .0
```

Program Package Serial Number: 7132

WATER SURFACE PROFILE LISTING

Date: 9- 7-2023 Time: 7:15:42

SAN JACINTO

PROPOSED LINE H-2 EXTENSION

10-YEAR STORM EVENT

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/ Dia.-FT or I.D.	Base Wt ZL	No Wth Prs/Pip	L/Elem	Ch Slope	"N"	X-Fall	ZR	SF Ave	HF	SE Dpth	Froude N	Norm Dp	Type Ch
1000.000	1513.290	3.181	1516.471	110.76	10.34	1.66	1518.13	.00	3.18	3.23	4.000	.000	.00	1	.0									
														4.720	.0042				.0061	.03	3.18	1.00	4.00	.013
												.00	.00	PIPE										
1004.720	1513.310	3.297	1516.607	110.76	10.00	1.55	1518.16	.39	3.18	3.04	4.000	.000	.00	1	.0									
														10.940	.0036				.0057	.06	3.68	.92	4.00	.013
												.00	.00	PIPE										
1015.660	1513.350	3.407	1516.757	110.76	9.71	1.46	1518.22	.00	3.18	2.84	4.000	.000	.00	1	.0									
														29.150	.0026				.0054	.16	3.41	.85	4.00	.013
												.00	.00	PIPE										

```
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  1044.810  1513.427    3.620  1517.047    110.76    9.26    1.33  1518.38     .00
 3.18     2.35    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    16.200    .0026                                        .0052      .08     3.62
   .72    4.00    .013       .00   .00  PIPE
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  1061.010  1513.470    3.700  1517.170    110.76    9.12    1.29  1518.46     .12
 3.18     2.11    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    39.070    .0031                                        .0052      .20     3.82
   .67    4.00    .013       .00   .00  PIPE
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  1100.080  1513.590    3.833  1517.423    110.76    8.94    1.24  1518.66     .00
 3.18     1.60    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    24.950    .0028                                        .0052      .13     3.83
   .57    4.00    .013       .00   .00  PIPE
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  1125.030  1513.660    3.917  1517.577    110.76    8.86    1.22  1518.80     .00
 3.18     1.14    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
 JUNCT STR   .0050                                        .0054      .03    3.92
  .47            .013       .00   .00  PIPE
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  1131.030  1513.690    3.963  1517.653    109.95    8.76    1.19  1518.84     .00
 3.17      .77    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    12.478    .0028                                        .0055      .07     3.96
   .38    4.00    .013       .00   .00  PIPE
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  1143.508  1513.725    4.000  1517.725    109.95    8.75    1.19  1518.91     .00
 3.17      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    51.602    .0028                                        .0057      .30     4.00
   .00    4.00    .013       .00   .00  PIPE
```

Program Package Serial Number: 7132

WATER SURFACE PROFILE LISTING

Date: 9- 7-2023 Time: 7:15:42

SAN JACINTO

PROPOSED LINE H-2 EXTENSION

10-YEAR STORM EVENT

```
**********************************************************************************************
************************************ ********
          | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super
|Critical|Flow Top|Height/|Base Wt|      |No Wth
  Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev |
Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    -|
  L/Elem  |Ch Slope |        |         |         |         SF Ave|    HF   |SE
Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch

*********|*********|********|*********|*********|*******|*******|*********|*******|*
*******|********|*******|*******|***** |*******
          |         |        |         |         |               |         |       |
       |        |       |       |      |
  1195.110  1513.870    4.157  1518.027    109.95    8.75    1.19  1519.22     .00
 3.17      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    |-
 JUNCT STR   .0033                                        .0047      .03    4.16
  .00             .013       .00   .00  PIPE
          |         |        |         |         |               |         |       |
       |        |       |       |      |
  1201.110  1513.890    4.879  1518.769     86.34    6.87     .73  1519.50     .00
 2.82      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    |-
   384.950    .0030                                        .0036     1.39     4.88
   .00    4.00    .013       .00   .00  PIPE
          |         |        |         |         |               |         |       |
       |        |       |       |      |
  1586.060  1515.040    5.119  1520.159     86.34    6.87     .73  1520.89     .00
 2.82      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    |-
    16.270    .0033                                        .0036      .06     5.12
   .00    3.46    .013       .00   .00  PIPE
          |         |        |         |         |               |         |       |
       |        |       |       |      |
```

```
  1602.330  1515.094    5.124  1520.218     86.34    6.87     .73  1520.95     .00
 2.82      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
```

```
T1 SAN JACINTO                                                                0

T2 EXISTING LINE H-3

T3 10-YEAR STORM EVENT

SO   1000.0001513.290  1                          1516.000

R    1010.5901513.330  1      .013                                .000    .000 0

R    1018.5001513.360  1      .013                             -30.079    .000 0

R    1323.9501514.680  1      .013                                .000    .000 0

JX   1329.9801514.780  5  4   .013    0.750         1514.680         45.0
.000
R    1566.1201515.730  5      .013                                .000    .000 0

TS   1568.2201515.830 10      .013                                .000

R    1568.3201515.880  8      .013                                .000  45.000 0

R    1590.8201517.990  8      .013                                .000    .000 0

SH   1590.8201517.990  8                          1517.990

CD   1  4   1    .000   3.000     .000  .000  .000   .00

CD   2  4   1    .000   1.500     .000  .000  .000   .00

CD   3  4   1    .000   3.000     .000  .000  .000   .00

CD   4  4   1    .000   1.500     .000  .000  .000   .00

CD   5  4   1    .000   3.000     .000  .000  .000   .00

CD   6  4   1    .000   1.500     .000  .000  .000   .00

CD   7  4   1    .000   1.500     .000  .000  .000   .00

CD   8  4   1    .000   1.500     .000  .000  .000   .00

CD   9  4   1    .000   1.500     .000  .000  .000   .00

CD  10  4   1    .000   1.500     .000  .000  .000   .00

Q            49.150   .0
```

Program Package Serial Number: 7132

WATER SURFACE PROFILE LISTING

Date: 1-22-2024 Time: 5:52: 5

SAN JACINTO

EXISTING LINE H-3

10-YEAR STORM EVENT

```
**********************************************************************************
************************************ ********
          | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super
|Critical|Flow Top|Height/|Base Wt|      |No Wth
  Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev |
Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    -|
  L/Elem  |Ch Slope |        |         |         |         SF Ave|    HF   |SE
Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch

*********|*********|********|*********|*********|*******|*******|*********|*******|*
*******|********|*******|*******|***** |*******
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  1000.000  1513.290    2.710  1516.000     49.90    7.43     .86  1516.86     .00
 2.30     1.77    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    10.590    .0038                                        .0049      .05     2.71
   .67    3.00    .013       .00   .00  PIPE
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  1010.590  1513.330    2.731  1516.061     49.90    7.39     .85  1516.91     .10
 2.30     1.71    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
     7.910    .0038                                        .0049      .04     2.83
   .66    3.00    .013       .00   .00  PIPE
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  1018.500  1513.360    2.746  1516.106     49.90    7.36     .84  1516.95     .00
 2.30     1.67    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
   240.511    .0043                                        .0051     1.23     2.75
   .64    3.00    .013       .00   .00  PIPE
```

```
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  1259.011  1514.399    3.000  1517.399     49.90    7.06     .77  1518.17     .00
 2.30      .00    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    64.939    .0043                                        .0055      .35     3.00
   .00    3.00    .013       .00   .00  PIPE
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  1323.950  1514.680    3.083  1517.763     49.90    7.06     .77  1518.54     .00
 2.30      .00    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
 JUNCT STR   .0166                                        .0055      .03    3.08
  .00             .013       .00   .00  PIPE
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  1329.980  1514.780    3.061  1517.841     49.15    6.95     .75  1518.59     .00
 2.28      .00    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    62.488    .0040                                        .0054      .34     3.06
   .00    3.00    .013       .00   .00  PIPE
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  1392.468  1515.031    3.148  1518.179     49.15    6.95     .75  1518.93     .00
 2.28      .00    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
 HYDRAULIC JUMP

         |         |        |         |         |               |         |       |
       |        |       |       |      |
  1392.468  1515.031    1.588  1516.619     49.15   12.94    2.60  1519.22     .00
 2.28     2.99    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
     5.492    .0040                                        .0183      .10     1.59
  2.03    3.00    .013       .00   .00  PIPE
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  1397.960  1515.053    1.569  1516.622     49.15   13.14    2.68  1519.30     .00
 2.28     3.00    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    13.198    .0040                                        .0199      .26     1.57
  2.07    3.00    .013       .00   .00  PIPE
```

Program Package Serial Number: 7132

WATER SURFACE PROFILE LISTING

Date: 1-22-2024 Time: 5:52: 5

SAN JACINTO

EXISTING LINE H-3

10-YEAR STORM EVENT

```
**********************************************************************************************
************************************ ********
          | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super
|Critical|Flow Top|Height/|Base Wt|      |No Wth
  Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev |
Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    -|
  L/Elem  |Ch Slope |        |         |         |         SF Ave|    HF   |SE
Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch

*********|*********|********|*********|*********|*******|*******|*********|*******|*
*******|********|*******|*******|***** |*******
          |         |        |         |         |               |         |       |
       |        |       |       |      |
  1411.158  1515.107    1.511  1516.617     49.15   13.78    2.95  1519.57     .00
 2.28     3.00    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    12.865    .0040                                    .0226      .29     1.51
  2.23    3.00    .013       .00   .00  PIPE
          |         |        |         |         |               |         |       |
       |        |       |       |      |
  1424.023  1515.158    1.455  1516.614     49.15   14.45    3.24  1519.86     .00
 2.28     3.00    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    12.516    .0040                                    .0257      .32     1.46
  2.39    3.00    .013       .00   .00  PIPE
          |         |        |         |         |               |         |       |
       |        |       |       |      |
  1436.539  1515.209    1.403  1516.611     49.15   15.16    3.57  1520.18     .00
 2.28     2.99    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    12.149    .0040                                    .0292      .36     1.40
  2.57    3.00    .013       .00   .00  PIPE
          |         |        |         |         |               |         |       |
       |        |       |       |      |
```

```
  1448.689  1515.257    1.352  1516.610     49.15   15.90    3.92  1520.53     .00
 2.28     2.99    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    11.769    .0040                                        .0333      .39     1.35
  2.75    3.00    .013       .00   .00  PIPE
          |         |        |         |         |              |         |       |
       |        |       |       |      |
  1460.458  1515.305    1.304  1516.609     49.15   16.67    4.32  1520.93     .00
 2.28     2.97    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    11.390    .0040                                        .0379      .43     1.30
  2.95    3.00    .013       .00   .00  PIPE
          |         |        |         |         |              |         |       |
       |        |       |       |      |
  1471.848  1515.351    1.258  1516.608     49.15   17.49    4.75  1521.36     .00
 2.28     2.96    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    11.017    .0040                                        .0431      .47     1.26
  3.16    3.00    .013       .00   .00  PIPE
          |         |        |         |         |              |         |       |
       |        |       |       |      |
  1482.865  1515.395    1.213  1516.608     49.15   18.34    5.22  1521.83     .00
 2.28     2.94    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    10.641    .0040                                        .0491      .52     1.21
  3.39    3.00    .013       .00   .00  PIPE
          |         |        |         |         |              |         |       |
       |        |       |       |      |
  1493.506  1515.438    1.171  1516.609     49.15   19.24    5.75  1522.35     .00
 2.28     2.93    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    10.274    .0040                                        .0560      .58     1.17
  3.63    3.00    .013       .00   .00  PIPE
          |         |        |         |         |              |         |       |
       |        |       |       |      |
  1503.780  1515.479    1.130  1516.609     49.15   20.18    6.32  1522.93     .00
 2.28     2.91    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
     9.915    .0040                                        .0638      .63     1.13
  3.88    3.00    .013       .00   .00  PIPE
```

WATER SURFACE PROFILE LISTING

Date: 1-22-2024 Time: 5:52: 5

SAN JACINTO

EXISTING LINE H-3

10-YEAR STORM EVENT

```
**********************************************************************************************
************************************ ********
          | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super
|Critical|Flow Top|Height/|Base Wt|      |No Wth
  Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev |
Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    -|
  L/Elem  |Ch Slope |        |         |         |         SF Ave|    HF   |SE
Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch

*********|*********|********|*********|*********|*******|*******|*********|*******|*
*******|********|*******|*******|***** |*******
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  1513.695  1515.519    1.091  1516.610     49.15   21.16    6.95  1523.56     .00
 2.28     2.89    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
     9.563    .0040                                    .0728      .70     1.09
  4.16    3.00    .013       .00   .00  PIPE
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  1523.259  1515.557    1.053  1516.611     49.15   22.19    7.65  1524.26     .00
 2.28     2.86    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
     9.221    .0040                                    .0830      .77     1.05
  4.45    3.00    .013       .00   .00  PIPE
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  1532.479  1515.595    1.017  1516.612     49.15   23.28    8.41  1525.02     .00
 2.28     2.84    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
     8.886    .0040                                    .0948      .84     1.02
  4.76    3.00    .013       .00   .00  PIPE
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  1541.365  1515.630     .983  1516.613     49.15   24.41    9.25  1525.87     .00
 2.28     2.82    3.000     .000   .00   1   .0
```

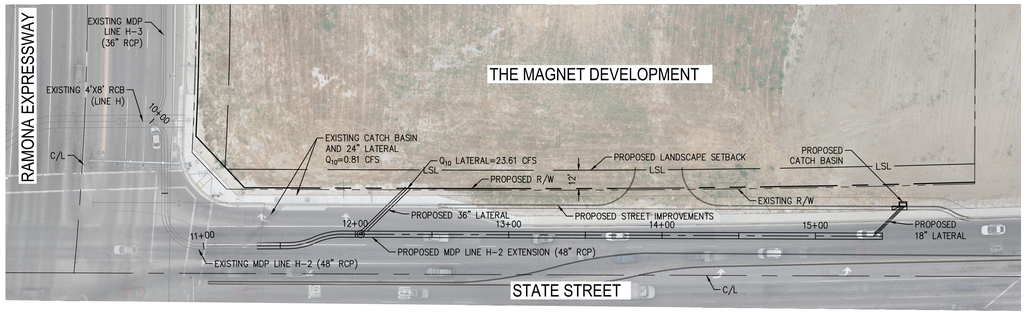
```
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
     8.563    .0040                                        .1082      .93      .98
  5.09    3.00    .013       .00   .00  PIPE
          |         |        |         |         |              |         |       |
        |       |       |       |      |
  1549.928  1515.665     .949  1516.614     49.15   25.60   10.18  1526.79     .00
 2.28     2.79    3.000     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
     8.248    .0040                                        .1235     1.02      .95
  5.44    3.00    .013       .00   .00  PIPE
          |         |        |         |         |              |         |       |
        |       |       |       |      |
  1558.176  1515.698     .917  1516.615     49.15   26.85   11.20  1527.81     .00
 2.28     2.76    3.000     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
     7.944    .0040                                        .1411     1.12      .92
  5.82    3.00    .013       .00   .00  PIPE
          |         |        |         |         |              |         |       |
        |       |       |       |      |
  1566.120  1515.730     .886  1516.616     49.15   28.16   12.32  1528.93     .00
 2.28     2.74    3.000     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
 TRANS STR   .0476                                        .1758      .37      .89
 6.22             .013       .00   .00  PIPE
          |         |        |         |         |              |         |       |
        |       |       |       |      |
  1568.220  1515.830    1.484  1517.314     49.15   27.86   12.06  1529.37     .00
 1.50      .31    1.500     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
      .100    .5006                                        .2078      .02     1.48
  2.05     .89    .013       .00   .00  PIPE
          |         |        |         |         |              |         |       |
        |       |       |       |      |
  1568.320  1515.880    1.499  1517.379     49.15   27.81   12.01  1529.39     .00
 1.50      .07    1.500     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
      .003    .0938                                        .2092      .00     1.50
  1.00    1.50    .013       .00   .00  PIPE
```

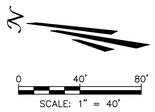
SAN JACINTO

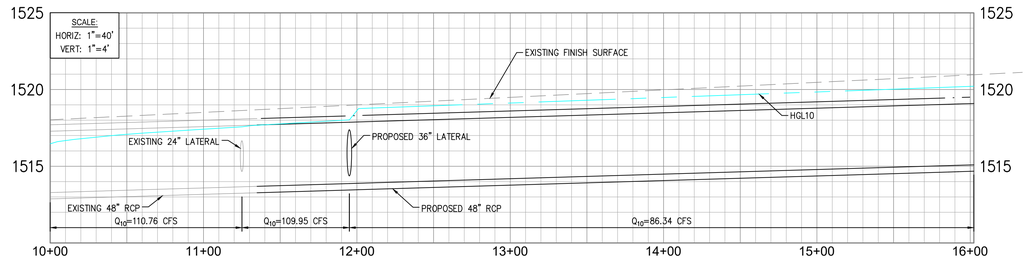
EXISTING LINE H-3

10-YEAR STORM EVENT

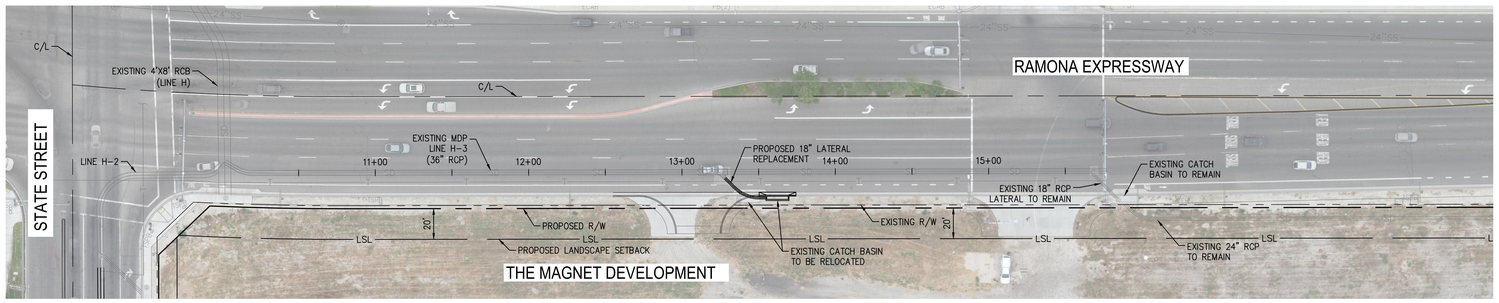
```
*************************************************************************************
*************************************** ********
          | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super
|Critical|Flow Top|Height/|Base Wt|      |No Wth
  Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev |
Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    -|
  L/Elem  |Ch Slope |        |        |         |        SF Ave|    HF   |SE
Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch

*********|*********|********|*********|*********|*******|*******|*********|*******|*
*******|********|*******|*******|***** |*******
          |         |        |         |         |               |         |       |
       |        |       |
```

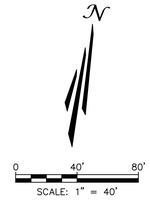


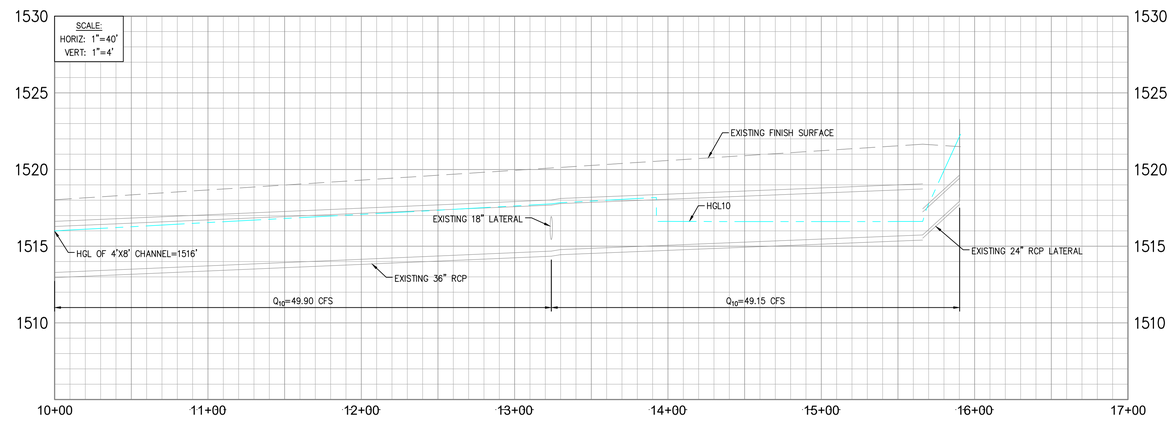




PROPOSED LINE H-2 EXTENSION







EXISTING LINE H-3

LEGEND:

- EXISTING FINISH SURFACE
- 10-YEAR HGL
- EXISTING RCP STORM DRAIN
- PROPOSED RCP STORM DRAIN

NO.	DESCRIPTION	BY	DATE

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DATE:
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DATE:
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