DRAINAGE STUDY

FOR

GS Valley Expansion
28435 Lizard Rocks Road
Valley Center, California 92082
(in unincorporated area of San Diego County)

Prepared For:

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DRC Project No. 19-132

TABLE OF CONTENTS

SECTION I

Introduction

A drainage study has been prepared for the GS Valley Expansion project in Valley Center, an unincorporated area of San Diego County. The project site is located on 28435 Lizard Rocks Road on the east side of the end of Lizard Rocks Road. The drainage area associated with this project (Study Area) is approximately 17.81 acres and the disturbed area associated with grading on this project is approximately 2.16 acres.

SECTION II

Discussion

The project site consists of the north lot, which is currently occupied by several residential structures and undeveloped areas, and the south lot, which is an existing industrial development currently occupied by eight (8) storage facilities and one (1) office building, paved drive aisles, vegetated slopes along the westerly and easterly property lines, and an above-ground stormwater detention basin in the southwesterly corner of the site. The proposed improvements include the demolition of the residential structures, the construction of a storage facility, paved drive aisles, concrete sidewalk, landscaped areas and slopes, concrete curb and gutter, underground storm drain system, and replacing the existing above-ground stormwater detention basin with an underground system.

In the existing condition, the project site can be divided into five (5) Drainage Management Areas: DMA-A, DMA-B, DMA-C, DMA-D, and DMA-E. Stormwater runoff generated from the north lot and approximately 3.95 acres of offsite area east of the site drains southwesterly overland into Lizard Rocks Road. Stormwater runoff generated from the north lot and the 3.95-acre offsite area is intercepted by the bioretention swale and drainage inlets near the southwest corner of the north lot. In the south lot, the area has been developed with two (2) separate stormwater mitigation features. Run-on from approximately 7.86 acres of offsite area east of the site drains westerly onto the lot into a concrete ditch that diverts run-on from approximately 2.11 acres of offsite area northerly into the site and run-on from the other 5.75-acre area southerly offsite. The offsite run-on, outflow from the existing detention basin, and the on-site sloped area along the southerly property line all flow in an existing concrete channel along the southerly property line and discharge through existing wall opening into Cole Grade Road approximately 250 feet west of the site.

- DMA-A – A 6.03-acre drainage area consisted of 2.08 acres of mostly undeveloped land that covers the entire north lot and a portion of Lizard Rocks Road along project frontage as well as 3.95 acres of mostly vacant land east of the site. DMA-A drains overland from northeast to southwest and is tributary to the bioretention swale and existing drainage inlets on both sides of Lizard Rocks Road near the southwest corner of the north lot. Runoff intercepted by the inlet overflows into Point of Discharge #1 (POC #1), discharges through the existing rip-rap dissipater, and drains into the vacant land across the street from the site per Improvement Plan No. CG 4646. The offsite run-on flows overland with the stormwater runoff generated on-site towards Lizard Rocks Road.

- DMA-B – An area of 0.53 acres of developed land located just south of the north lot that surface drains into existing drainage inlets and is tributary to an existing Storm Chamber system west of the existing buildings. Stormwater drains into existing Storm Chamber system and overflows from an existing discharge basin per Grading Plan No. L-14940. From there, stormwater sheet flows northwesterly into the existing drainage inlet on Lizard Rocks Road per Improvement Plan No. CG 4646. Runoff intercepted by the inlet overflows into POC #1, discharges through the existing rip-rap dissipater, and drains into the vacant land across the street from the site.
- DMA-C – A 5.16-acre drainage area consisted of 2.11 acres of offsite partially vacant land east of the site and 3.05 acres of developed land located in the south lot that surface drains into onsite gutters, onsite drainage inlets, and an existing concrete channel located offsite. All offsite run-ons are intercepted by an existing concrete ditch onsite along the easterly property line that drains the run-on into onsite gutters. Stormwater runoff generated from DMA-C is discharged into an existing above-ground excavated detention basin and then into an existing off-site concrete channel that runs along the southerly property line of the site. Ultimately, the entire DMA drains into POC #2 located in the southwest corner of the site at the offsite concrete channel. All stormwater runoff in the offsite concrete ditch is discharged into Cole Grade Road.
- DMA-D – A 5.97-acre drainage area consisted of 0.22 acres of onsite slope between existing storage facilities and the easterly and southerly property lines as well as 5.75 acres of offsite area east of the site that has a residential structure but is mostly undeveloped. Offsite run-ons are intercepted by an existing concrete ditch onsite along the easterly property line that drains the run-on southerly into the existing concrete channel south of the property and comingles with the stormwater runoff discharged from the DMA-C and onsite portion of DMA-D at POC #2.
- DMA-E – An area of 0.12 acres of pervious slope located mainly along the southwesterly property line that is considered self-mitigating.

In the proposed condition, the project site remains to have five (5) Drainage Management Areas as in the existing condition. A new underground detention system in conjunction with a manhole installed with a weir and orifice for flow control will mitigate stormwater runoff generated from the north lot. The existing Storm Chamber will remain to mitigate stormwater runoff from the area just south of the north lot. In the remaining south lot, an underground detention system is proposed to replace the existing above-ground detention basin. Points of Discharge (POC) remain the same as in the existing condition.

- DMA-A – A 6.10-acre drainage area including the proposed 1.86-acre commercial development located mainly in the north lot that surface drains into proposed drainage inlets connected to the proposed underground storm drain system, 0.27 acres of Lizard Rock Roads along site frontage, and 3.97 acres of offsite area that is mostly vacant. Run-on from the 3.97-acre offsite area will be intercepted by a proposed concrete ditch along the easterly property line that drains into a proposed inlet that connects to the existing inlet on the east side of Lizard Rocks Road via a proposed storm drain pipe. The proposed underground storm drain system discharges the runoff from 1.86-acres of the DMA into the proposed underground detention system sized to address both stormwater quality and hydromodification with a flow-controlled manhole. Drainage pattern within Lizard Rocks remains the same as in the existing condition. Runoff generated from Lizard Rocks Road within the DMA surface drain into the existing bioretention swale and existing drainage inlets on both sides of Lizard Rocks Road near the southwest corner of the north lot.

Runoff intercepted by the inlet overflows into Point of Discharge #1 (POC #1), discharges through the existing rip-rap dissipater, and drains into the vacant land across the street from the site per Improvement Plan No. CG 4646. Within DMA-A, subarea 8A is considered self-mitigating since it's entirely landscaped and drains offsite into Lizard Rocks Road and enters the existing inlets which overflows into POC #1.

A proprietary biofiltration unit is proposed for treatment of the first-flush stormwater runoff from the north lot before discharging into the existing drainage inlet located on the east side of Lizard Rocks Road at the southwest corner of the site. Infiltration is not suitable at the project site due to perched groundwater per the soils study prepared by the project geotechnical engineer.

- DMA-B – An area of 0.40 acres of previously developed commercial land in the south lot located just to the south of DMA-A. This DMA remains undisturbed and the tributary area is reduced in the proposed condition. This area will continue to drain to the existing Storm Chamber system, overflow from the existing discharge basin, sheet flow into the existing drainage inlet on Lizard Rocks Road, and overflows into POC #1.
- DMA-C – A 5.21-acre drainage area consisted of 2.60 acres of previously developed commercial land located in the south lot that remains the same drainage pattern as in the existing condition, 0.50 acres of area that is a combination of previously developed commercial land in the south lot and a sliver of new slope along the easterly property line in the north lot, and 2.11 acres of offsite partially vacant area east of the site. All offsite run-ons are intercepted by an existing concrete ditch onsite along the easterly property line that drains the run-on into onsite gutters. Stormwater runoff generated from DMA-C, except for subarea 9C.1 and 9C.2, are discharged into an underground detention system that replaces the existing excavated detention basin but will continue to discharge into the existing offsite concrete channel along the southerly property line, designated as POC #2. A manhole with a weir structure and an orifice is proposed just downstream of the underground detention system for flow control. Subarea 9C.1 and 9C.2 bypass the underground detention system and drains directly into the storm drain pipe that outlets into the offsite concrete ditch. As in the existing condition, all stormwater runoff in the offsite concrete ditch is discharged into Cole Grade Road.
- DMA-D – A 5.97-acre drainage area that is not disturbed and is consisted of 0.22 acres of onsite slope between existing storage facilities and the easterly and southerly property lines as well as 5.75 acres of offsite area east of the site that has a residential structure but is mostly undeveloped. Offsite run-ons are intercepted by an existing concrete ditch onsite along the easterly property line that drains the run-on southerly into the existing concrete channel south of the property and comingles with the stormwater runoff discharged from the DMA-C and onsite portion of DMA-D at POC #2.
- DMA-E – An area of 0.12 acres of pervious slope located mainly along the southwesterly property line that is not disturbed and is considered self-mitigating.

Existing and proposed drainage patterns for subareas tributary to each POC have been analyzed with Bentley FlowMaster V8i software to determine that the proposed development would not result in substantial erosion or siltation on- or off-site and will be further discussed in Section VI Summary.

The proposed project does not place housing or any other structures within the 100-year flood hazard area as mapped on the Federal Emergency Management Agency (FEMA) National Flood Hazard

Layer Map shown in Appendix F of this drainage study. The site is not within a 100-year flood plain and does not impede, increase, or redirect flood flows.

SECTION III

Methodology

Rational Method

The Rational Method (Q = C x i x A) outlined in the San Diego County Hydrology Manual (2003) was applied in the calculation of the 10-, 25-, and 100-year storm event peak rate of runoff for each Drainage Management Area (DMA) using the Advanced Engineering Software (AES).

The 6-hour and 24-hour duration precipitation for the 10-, 25-, and 100-year storm frequencies were gathered from the rainfall isopluvial maps in the County Hydrology Manual. Per Figure 3-1, Intensity-Duration Design Chart, shown in Appendix A of this Drainage Study, the 6-hour precipitation for each frequency was adjusted so that the value is within the 45% to 65% range of the 24-hour precipitation value.

For each DMA in the existing and proposed conditions, the Runoff Coefficient, C and slope (%) were determined. Runoff Coefficient C was determined based on the land use for each DMA. Using the calculated Runoff Coefficient C with Table 3-1, the corresponding Soil Group and County Element Land Use was noted for inputting into AES software. Slope (%) for each DMA was determined by dividing the upstream and downstream elevations by the flow path length.

For each DMA in both the existing and proposed conditions for the 10-, 25-, and 100-year storm events, AES software applies the methods described in the County Hydrology Manual to calculate the time of concentration, T_c. AES software determines the initial time of concentration and maximum overland flow length based on Table 3-2 by inputting the subarea slope (%) and the County Element Land Use into the software. AES software calculates the total overland time of flow, or time of concentration for each subarea based on Figure 3-3 on flowpath length, slope (%), and runoff coefficient.

AES software is able to calculate rainfall intensity, i (inches/hour) based on Figure 3-1 of the County Hydrology Manual. From there, AES software calculates the peak flow rate, Q_{10}, Q_{25}, and Q_{100} with the calculated Runoff Coefficient, C; rainfall intensity, i; and the inputted acreage, A for each DMA.

Table 3-1
RUNOFF COEFFICIENTS FOR URBAN AREAS

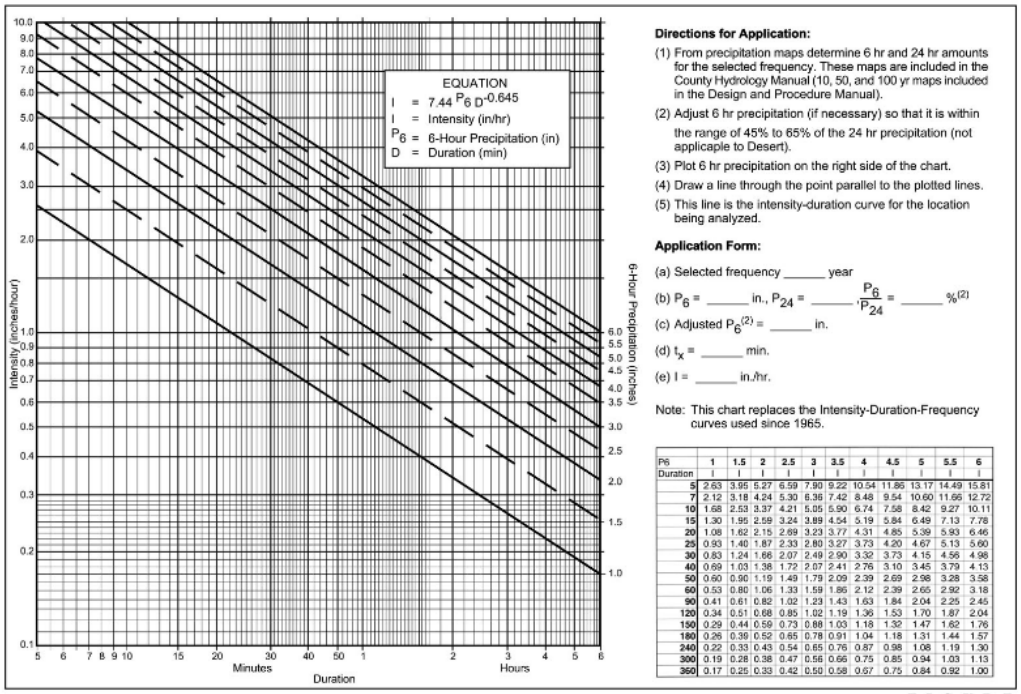
Land Use		Runoff Coefficient "C"				
			Soil Type			
NRCS Elements	County Elements	% IMPER.	A	B	C	D
Undisturbed Natural Terrain (Natural)	Permanent Open Space	0*	0.20	0.25	0.30	0.35
Low Density Residential (LDR)	Residential, 1.0 DU/A or less	10	0.27	0.32	0.36	0.41
Low Density Residential (LDR)	Residential, 2.0 DU/A or less	20	0.34	0.38	0.42	0.46
Low Density Residential (LDR)	Residential, 2.9 DU/A or less	25	0.38	0.41	0.45	0.49
Medium Density Residential (MDR)	Residential, 4.3 DU/A or less	30	0.41	0.45	0.48	0.52
Medium Density Residential (MDR)	Residential, 7.3 DU/A or less	40	0.48	0.51	0.54	0.57
Medium Density Residential (MDR)	Residential, 10.9 DU/A or less	45	0.52	0.54	0.57	0.60
Medium Density Residential (MDR)	Residential, 14.5 DU/A or less	50	0.55	0.58	0.60	0.63
High Density Residential (HDR)	Residential, 24.0 DU/A or less	65	0.66	0.67	0.69	0.71
High Density Residential (HDR)	Residential, 43.0 DU/A or less	80	0.76	0.77	0.78	0.79
Commercial/Industrial (N. Com)	Neighborhood Commercial	80	0.76	0.77	0.78	0.79
Commercial/Industrial (G. Com)	General Commercial	85	0.80	0.80	0.81	0.82
Commercial/Industrial (O.P. Com)	Office Professional/Commercial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (Limited I.)	Limited Industrial	90	0.83	0.84	0.84	0.85
Commercial/Industrial (General I.)	General Industrial	95	0.87	0.87	0.87	0.87

*The values associated with 0% impervious may be used for direct calculation of the runoff coefficient as described in Section 3.1.2 (representing the pervious runoff coefficient, Cp, for the soil type), or for areas that will remain undisturbed in perpetuity. Justification must be given that the area will remain natural forever (e.g., the area is located in Cleveland National Forest).
DU/A = dwelling units per acre
NRCS = National Resources Conservation Service

Table 3-2

MAXIMUM OVERLAND FLOW LENGTH (L_M)
& INITIAL TIME OF CONCENTRATION (T_i)

Element*	DU/	.5%		1%		2%		3%		5%		10%	
	Acre	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i
Natural		50	13.2	70	12.5	85	10.9	100	10.3	100	8.7	100	6.9
LDR	1	50	12.2	70	11.5	85	10.0	100	9.5	100	8.0	100	6.4
LDR	2	50	11.3	70	10.5	85	9.2	100	8.8	100	7.4	100	5.8
LDR	2.9	50	10.7	70	10.0	85	8.8	95	8.1	100	7.0	100	5.6
MDR	4.3	50	10.2	70	9.6	80	8.1	95	7.8	100	6.7	100	5.3
MDR	7.3	50	9.2	65	8.4	80	7.4	95	7.0	100	6.0	100	4.8
MDR	10.9	50	8.7	65	7.9	80	6.9	90	6.4	100	5.7	100	4.5
MDR	14.5	50	8.2	65	7.4	80	6.5	90	6.0	100	5.4	100	4.3
HDR	24	50	6.7	65	6.1	75	5.1	90	4.9	95	4.3	100	3.5
HDR	43	50	5.3	65	4.7	75	4.0	85	3.8	95	3.4	100	2.7
N. Com		50	5.3	60	4.5	75	4.0	85	3.8	95	3.4	100	2.7
G. Com		50	4.7	60	4.1	75	3.6	85	3.4	90	2.9	100	2.4
O.P./Com		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
Limited I.		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
General I.		50	3.7	60	3.2	70	2.7	80	2.6	90	2.3	100	1.9



Directions for Application:

(1) From precipitation maps determine 6 hr and 24 hr amounts for the selected frequency. These maps are included in the County Hydrology Manual (10, 50, and 100 yr maps included in the Design and Procedure Manual).

(2) Adjust 6 hr precipitation (if necessary) so that it is within the range of 45% to 65% of the 24 hr precipitation (not applicable to Desert).

(3) Plot 6 hr precipitation on the right side of the chart.

(4) Draw a line through the point parallel to the plotted lines.

(5) This line is the intensity-duration curve for the location being analyzed.

Application Form:

(a) Selected frequency _____ year

(b) P_6 = _____ in., P_{24} = _____, $\frac{P_6}{P_{24}}$ = _____ %[2]

(c) Adjusted P_6[2] = _____ in.

(d) t_x = _____ min.

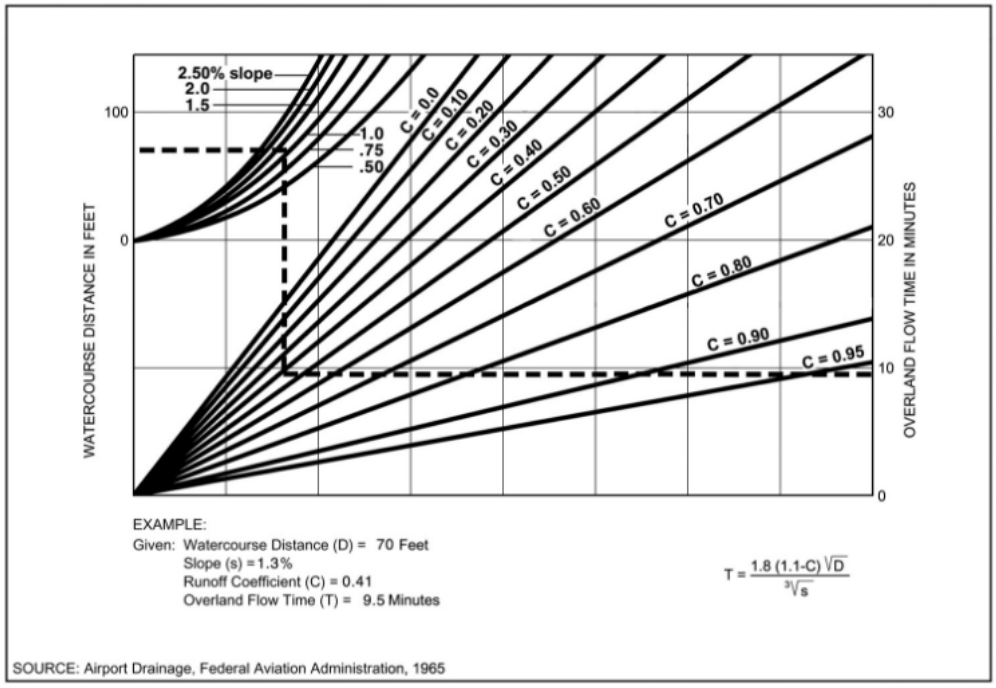
(e) I = _____ in./hr.

Note: This chart replaces the Intensity-Duration-Frequency curves used since 1965.

P6	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
Duration	I	I	I	I	I	I	I	I	I	I	I
5	2.63	3.95	5.27	6.59	7.90	9.22	10.54	11.86	13.17	14.49	15.81
7	2.12	3.18	4.24	5.30	6.36	7.42	8.48	9.54	10.60	11.66	12.72
10	1.68	2.53	3.37	4.21	5.05	5.90	6.74	7.58	8.42	9.27	10.11
15	1.30	1.95	2.59	3.24	3.89	4.54	5.19	5.84	6.49	7.13	7.78
20	1.08	1.62	2.15	2.69	3.23	3.77	4.31	4.85	5.39	5.93	6.46
25	0.93	1.40	1.87	2.33	2.80	3.27	3.73	4.20	4.67	5.13	5.60
30	0.83	1.24	1.66	2.07	2.49	2.90	3.32	3.73	4.15	4.56	4.98
40	0.69	1.03	1.38	1.72	2.07	2.41	2.76	3.10	3.45	3.79	4.13
50	0.60	0.90	1.19	1.49	1.79	2.09	2.39	2.69	2.98	3.28	3.58
60	0.53	0.80	1.06	1.33	1.59	1.86	2.12	2.39	2.65	2.92	3.18
90	0.41	0.61	0.82	1.02	1.23	1.43	1.63	1.84	2.04	2.25	2.45
120	0.34	0.51	0.68	0.85	1.02	1.19	1.36	1.53	1.70	1.87	2.04
150	0.29	0.44	0.59	0.73	0.88	1.03	1.18	1.32	1.47	1.62	1.76
180	0.26	0.39	0.52	0.65	0.78	0.91	1.04	1.18	1.31	1.44	1.57
240	0.22	0.33	0.43	0.54	0.65	0.76	0.87	0.98	1.08	1.19	1.30
300	0.19	0.28	0.38	0.47	0.56	0.66	0.75	0.85	0.94	1.03	1.13
360	0.17	0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.84	0.92	1.00

Intensity-Duration Design Chart - Template

FIGURE 3-1



EXAMPLE:
Given: Watercourse Distance (D) = 70 Feet
Slope (s) = 1.3%
Runoff Coefficient (C) = 0.41
Overland Flow Time (T) = 9.5 Minutes

$$T = \frac{1.8\,(1.1-C)\sqrt{D}}{\sqrt[3]{s}}$$

SOURCE: Airport Drainage, Federal Aviation Administration, 1965

Rational Formula - Overland Time of Flow Nomograph

FIGURE 3-3

Hydromodification

The stormwater runoff for the 100-year storm event generated from DMA-A and DMA-C for the existing and proposed conditions were calculated by AES software. The drainage subareas tributary to the two proposed underground detention systems and the runoff generated from those areas were determined since only a portion of the DMA drains into the underground detention system in the proposed condition. Hydrographs were generated with Rick Engineering Company's Rational Method Hydrograph software (RickRatHydro) by inputting the time of concentration values calculated with AES software, the adjusted 6-hour precipitation values calculated per Figure 3-1, the tributary DMA area in acres, the Rational Method Runoff Coefficient as previously determined, and 100-year peak discharge (cfs) calculated with AES software determined earlier.

The "pre-development (existing)" and "mitigated" scenarios for DMA-A and DMA-C for the 100-year storm event were analyzed by using hydrograph results generated from RickRatHydro in conjunction with Civil3D Hydraflow Hydrograph software.

The 100-year storm event hydrograph results for the existing and proposed conditions that were generated from RickRatHydro were inputted into Civil3D Hydraflow Hydrograph software. From there, a "pond" was created in Hydraflow software to simulate the proposed detention system with a weir and an orifice that control the outflow. Next, a "reservoir" was created to represent the "mitigated" scenario for both DMA-A and DMA-C. The results from RickRatHydro were used as the "inflow hydrograph". The size of the weir and orifice in the "pond" were adjusted until the discharge from the detention system is less than the allowable runoff in the "pre-development (existing)" condition.

The allowable runoff for the detention system (System #1) in DMA-A is calculated with steps below:

1) Determine total runoff not tributary to System #1 from result of AES software (stormwater runoff generated from drainage subareas that bypass System #1: 1A.1 & 1A.2, 8A, 9A.1 & 9A.,2, and 10A.1 & 10A.2)
2) Determine total runoff generated from DMA-A in the pre-development (existing) condition from result of AES software
3) Allowable runoff = Runoff determined in Step 2 – Runoff calculated in Step 1

The allowable runoff for the detention system (System #2) in DMA-C is calculated with steps below:

1) Determine total runoff not tributary to System #2 from result of AES software (stormwater runoff generated from drainage subareas that bypass System #2: 9C.1 & 9C.,2)
2) Determine total runoff generated from DMA-C in the pre-development (existing) condition from result of AES software
3) Allowable runoff = Runoff determined in Step 2 – Runoff calculated in Step 1

Point of Discharge (POC) Erosion Analysis

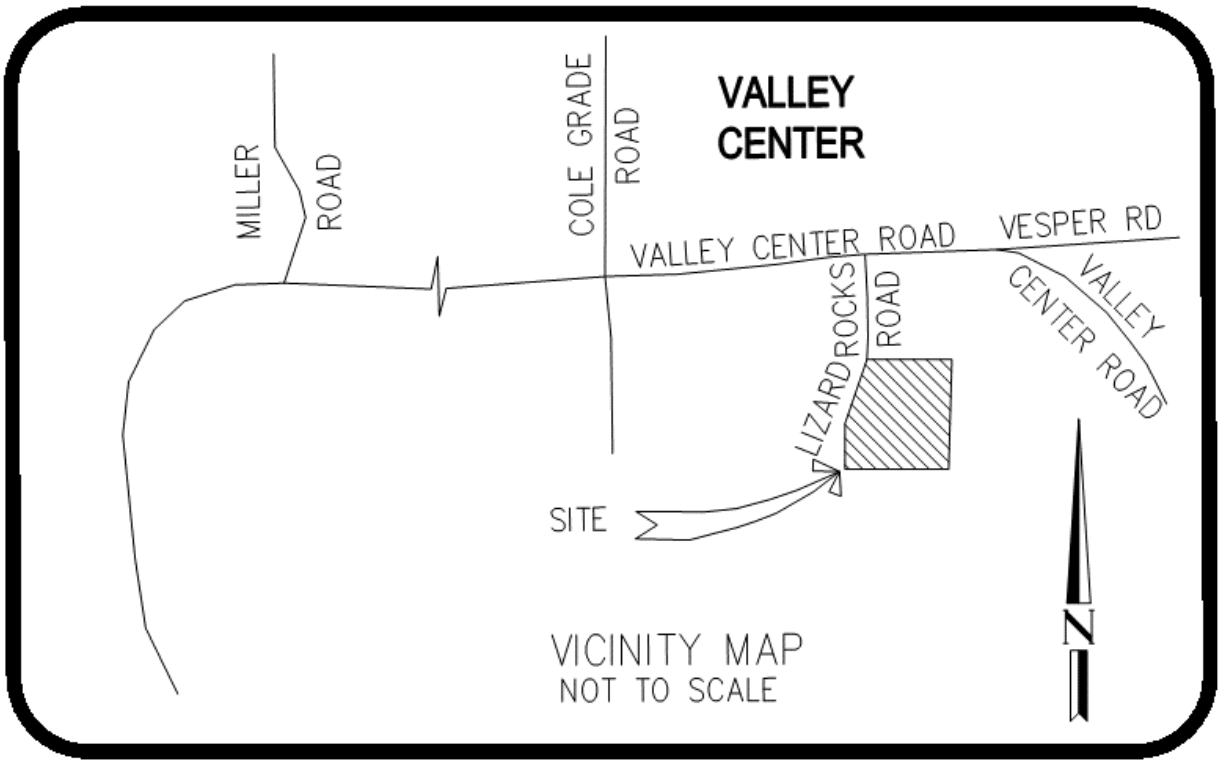
The drainage patterns for each DMA have been analyzed with Bentley FlowMaster V8i software to determine that each POC would not result in substantial erosion or siltation. The results are described in the Summary of this Drainage Study. Calculations are included as Appendix D in this drainage study.

Pipe Size Analysis

The AES software computes the size of the proposed storm drain system. Calculations are included as Appendix D in this drainage study.

SECTION IV

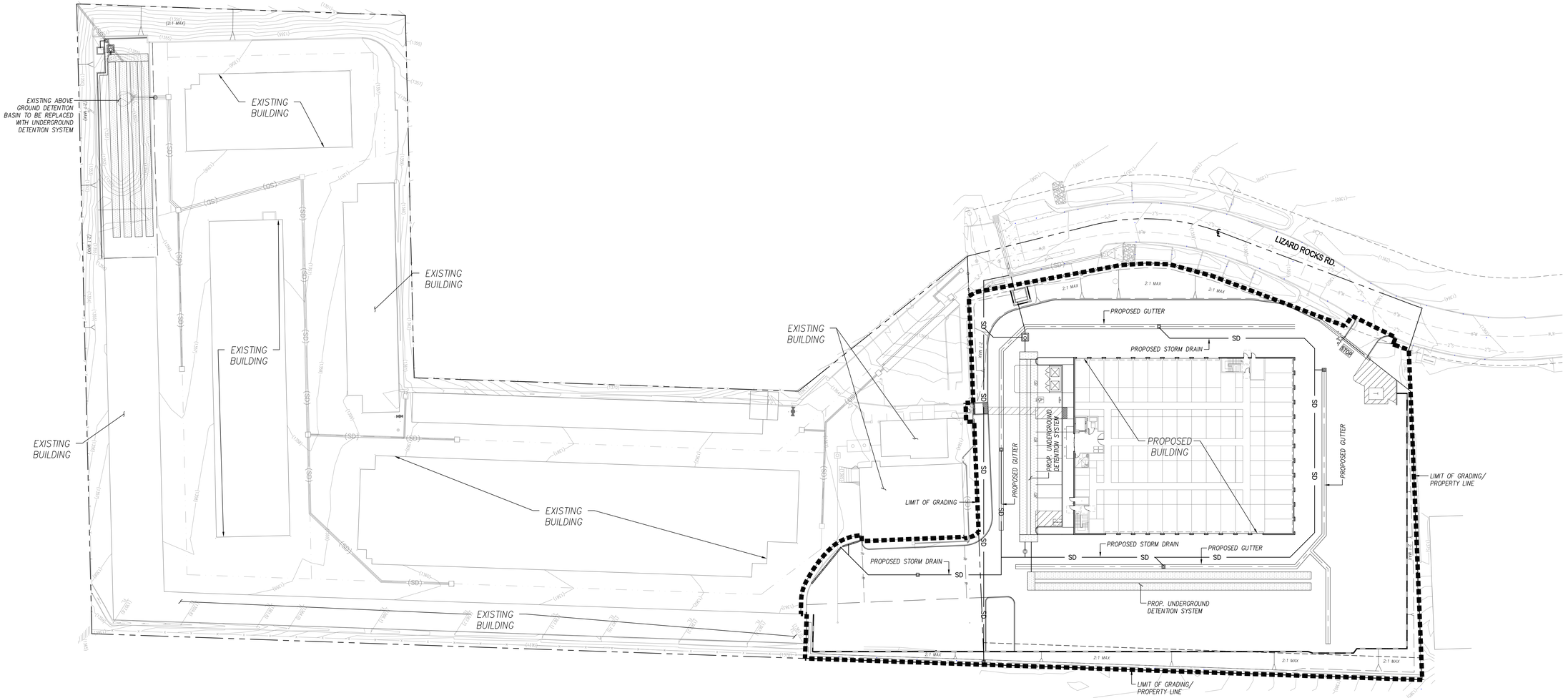
Vicinity Map



SECTION V

Site Map

A site map showing features of the project site is included on the next page.



NOT FOR CONSTRUCTION

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NO.:	REVISION:	DATE:

PROJECT:

GS VALLEY EXPANSION
28435 LIZARD ROCKS ROAD
VALLEY CENTER, CALIFORNIA

DRAWING NAME:

SITE MAP

ISSUE:	HYDROLOGY
DATE:	5/27/2021
CHECKED: JH	DRAWN: JH
DRAWING FILE: 19132SP	
PROJECT NO.: 19-132	
SHEET NUMBER: 1	
OF 1	SHEETS
SCALE: AS SHOWN	

FILENAME: M:\2019\19-132 Greens Global Valley Center SD\HM\19132 SP.dwg, LAST SAVED ON: May 27 2021 10:45am PLOTTED BY: JULIE, ON: May 27 2021 10:47am, CFG:

SECTION VI

Summary

Rational Method

From Figure 3-1 of the County Hydrology Manual, the following adjusted 6-hour precipitation was determined for each storm event:

- 10-year storm event = 2.7 in.
- 25-year storm event = 3.0 in.
- 100-year storm event = 4.5 in.

For each drainage management area (DMA), the runoff coefficients C, and slope (%) were determined. Although the site is classified as "limited industrial", the Runoff Coefficient, C was determined based on the percent impervious area calculated for each DMA. Based on the soil group of each DMA, the corresponding Land Use from Table 3-1 was noted for inputting into AES software.

Runoff Coefficients: Existing Condition

Subarea	Land Use Input for AES	C	Soil Group
1A.1	Natural Desert Landscaping	0.30	C
1A.2	Residential (2 DU/AC) or less	0.42	C
2A.1	Natural Desert Landscaping	0.30	C
2A.2	Natural Desert Landscaping	0.30	C
2A.3	Residential (1 DU/AC) or less	0.36	C
3A.1	Natural Desert Landscaping	0.30	C
3A.2	Residential (2 DU/AC) or less	0.42	C
1B	Residential (2.9 DU/AC) or less	0.45	C
2B	Limited Industrial	0.84	C
3B	Limited Industrial	0.84	C
4B	Limited Industrial	0.84	C
5B	Limited Industrial	0.84	C
6B	Limited Industrial	0.84	C
7B.1	Limited Industrial	0.84	C
7B.2	Limited Industrial	0.84	C
1C.1	Natural Desert Landscaping	0.30	C
1C.2	Residential (2 DU/AC) or less	0.42	C
1C.3	Limited Industrial	0.83	A
2C	Limited Industrial	0.84	C
3C.1	Artificial Desert Landscaping	0.87	C
3C.2	Limited Industrial	0.84	C
4C.1	Artificial Desert Landscaping	0.87	C
4C.2	Artificial Desert Landscaping	0.87	C
5C	Limited Industrial	0.84	C
6C.1	Limited Industrial	0.84	C
6C.2	Limited Industrial	0.84	C
7C	Limited Industrial	0.84	C
8C	Limited Industrial	0.83	A

Subarea	Land Use Input for AES	C	Soil Group
9C	Residential (2 DU/AC) or less	0.34	A
1D.1	Natural Desert Landscaping	0.30	C
1D.2	Residential (1 DU/AC) or less	0.27	A
1D.3	Residential (4.3 DU/AC) or less	0.48	C
2D	Natural Desert Landscaping	0.30	C
1E	Natural Desert Landscaping	0.20	A

Runoff Coefficients: Proposed Condition

Subarea	Land Use Input for AES	C	Soil Group
1A.1	Paved road with ditch	0.69	C
1A.2	Paved road with ditch	0.69	C
2A.1	Limited Industrial	0.84	C
2A.2	Limited Industrial	0.84	C
3A.1	Limited Industrial	0.84	C
3A.2	Limited Industrial	0.84	C
4A.1	Limited Industrial	0.84	C
4A.2	Limited Industrial	0.84	C
5A	Limited Industrial	0.84	C
6A	Limited Industrial	0.84	C
7A.1	Limited Industrial	0.84	C
7A.2	Limited Industrial	0.84	C
8A	Urban Newly Graded Areas	0.69	C
9A.1	Natural Desert Landscaping	0.30	C
9A.2	Natural Desert Landscaping	0.30	C
10A.1	Paved road with ditch	0.69	C
10A.2	Paved road with ditch	0.69	C
1B	Limited Industrial	0.84	C
2B	Limited Industrial	0.84	C
3B	Limited Industrial	0.84	C
4B	Limited Industrial	0.84	C
5B	Limited Industrial	0.84	C
6B	Limited Industrial	0.84	C
7B.1	Limited Industrial	0.84	C
7B.2	Limited Industrial	0.84	C
1C.1	Natural Desert Landscaping	0.30	C
1C.2	Residential (2DU/AC) or less	0.42	C
1C.3	Limited Industrial	0.83	A
2C	Limited Industrial	0.84	C
3C.1	Artificial Desert Landscaping	0.87	C
3C.2	Limited Industrial	0.84	C
4C.1	Artificial Desert Landscaping	0.87	C
4C.2	Artificial Desert Landscaping	0.87	C
5C	Residential (1 DU/AC) or less	0.84	C
6C.1	Limited Industrial	0.84	C
6C.2	Limited Industrial	0.84	C
7C	Residential (1 DU/AC) or less	0.84	C

Subarea	Land Use Input for AES	C	Soil Group
8C	Residential (1 DU/AC) or less	0.83	A
9C.1	Limited Industrial	0.83	A
9C.2	Limited Industrial	0.83	A
1D.1	Residential (4.3 DU/AC) or less	0.30	C
1D.2	Residential (1 DU/AC) or less	0.27	A
1D.3	Residential (4.3 DU/AC) or less	0.48	C
2D	Natural Desert Landscaping	0.30	C
1E	Natural Desert Landscaping	0.20	A

The Rational Method (Q = C x i x A) was applied with AES software to calculate the peak flow rates, Q_{10}, Q_{25}, and Q_{100}. For each DMA, the designated land use inputs listed in the tables on the previous page were inputted in order to model the correct Runoff Coefficient, C. For each DMA, the Soil Classification, total Area, A, flowpath lengths, upstream elevations, and downstream elevations were input.

AES calculates the rainfall intensity and time of concentration based on the methods described in the County Hydrology Manual.

Summary of the hydrologic analyses is tabulated on the following pages.

Existing Condition													
DMA	Tributary Area (acres)	Runoff Coefficient, C	Flowpath, D (ft)	Slope, s (%)	10-Year Storm			25-Year Storm			100-Year Storm		
					Q_{10}	Tc_{10}	i_{10}	Q_{25}	Tc_{25}	i_{25}	Q_{100}	Tc_{100}	i_{100}
					cfs	min.	in/hr	cfs	min.	in/hr	cfs	min.	in/hr
1A.1	0.13	0.30	100	13.2	0.23	6.7	5.9	0.26	6.7	6.6	0.38	6.7	9.8
1A.2	0.73	0.42	305	5.1	1.18	13.0	3.8	1.36	12.2	4.4	2.14	11.4	7.0
2A.1	0.40	0.30	100	5.0	0.61	8.4	5.1	0.68	8.4	5.6	1.02	8.4	8.5
2A.2	3.55	0.30	465	5.9	3.81	14.5	3.6	4.30	14.2	4.0	6.63	13.6	6.2
2A.3	0.41	0.36	278	5.2	0.49	16.5	3.3	0.55	16.0	3.7	0.86	15.2	5.8
3A.1	0.17	0.30	100	11.2	0.30	6.7	5.9	0.33	6.7	6.6	0.50	6.7	9.8
3A.2	0.65	0.42	294	4.4	1.15	11.3	4.2	1.24	11.8	4.5	1.98	10.7	7.2
"A" Subtotal	**6.03**	**0.33**	--	--	**6.60**	**16.6**	--	**7.48**	**16.1**	--	**11.63**	**15.3**	--
1B	0.15	0.45	95	5.7	0.41	6.4	6.1	0.46	6.4	6.7	0.68	6.4	10.1
2B	0.05	0.84	--	--	0.24	5.0	5.8	0.27	5.0	6.4	0.41	5.0	9.7
3B	0.04	0.84	89	6.9	0.24	5.0	7.1	0.27	5.0	7.9	0.40	5.0	11.9
4B	0.14	0.84	60	10.3	0.84	5.0	7.1	0.93	5.0	7.9	1.39	5.0	11.9
5B	0.06	0.84	54	4.3	0.36	5.0	7.1	0.40	5.0	7.9	0.60	5.0	11.9
6B	0.00	0.84	--	--	0.03	5.0	7.1	0.03	5.0	7.9	0.05	5.0	11.9
7B.1	0.08	0.84	80	3.1	0.48	5.0	7.1	0.53	5.0	7.9	0.80	5.0	11.9
7B.2	0.02	0.84	36	3.6	0.12	5.0	7.1	0.13	5.0	7.9	0.20	5.0	11.9
"B" Subtotal	**0.53**	**0.73**	--	--	**2.64**	**5.0**	--	**2.93**	**5.0**	--	**4.41**	**5.0**	--
1C.1	0.31	0.30	100	4.0	0.45	9.1	4.8	0.50	9.1	5.4	0.75	9.1	8.1
1C.2	1.80	0.42	380	7.1	2.70	14.5	3.6	3.03	14.3	4.0	4.75	13.4	6.3
1C.3	0.44	0.83	371	2.7	1.21	16.3	3.3	1.36	16.0	3.7	7.09	15.0	5.8
2C	0.59	0.84	--	--	1.62	5.0	3.3	1.82	5.0	3.7	2.85	5.0	5.7
3C.1	0.04	0.87	90	5.1	0.25	5.0	7.1	0.28	5.0	7.9	0.41	5.0	11.9
3C.2	0.32	0.84	297	2.0	1.91	5.0	7.1	2.12	5.0	7.9	3.19	5.0	11.9
4C.1	0.03	0.87	60	8.5	0.19	5.0	7.1	0.21	5.0	7.9	0.31	5.0	11.9
4C.2	0.01	0.87	70	9.0	0.06	5.0	7.1	0.07	5.0	7.9	0.10	5.0	11.9
5C	0.44	0.84	--	--	1.19	5.0	3.2	1.34	5.0	3.6	2.09	5.0	5.7
6C.1	0.11	0.84	53	1.1	0.66	5.0	7.1	0.73	5.0	7.9	1.10	5.0	11.9
6C.2	0.35	0.84	188	1.1	2.09	5.0	7.1	2.32	5.0	7.9	3.49	5.0	11.9
7C	0.25	0.84	--	--	1.44	5.3	6.8	1.63	5.2	7.7	2.49	5.0	11.9
8C	0.33	0.83	--	--	0.87	5.0	3.2	0.98	5.0	3.6	1.53	5.0	5.6
9C	0.13	0.34	--	--	0.14	5.0	3.2	0.16	5.0	3.6	0.25	5.0	5.6
"C" Subtotal	**5.16**	**0.65**	--	--	**10.56**	**17.5**	--	**11.85**	**17.2**	--	**18.58**	**16.1**	--
1D.1	0.57	0.30	100	23.0	1.01	6.7	5.9	1.12	6.7	6.6	1.68	6.7	9.8
1D.2	5.18	0.27	651	9.4	4.91	15.0	3.5	5.70	14.0	4.1	9.07	12.8	6.5
1D.3	0.10	0.48	181	5.6	0.17	15.2	3.5	0.19	14.2	4.0	0.31	13.0	6.4
2D	0.12	0.30	22	4.5	0.26	5.0	7.1	0.28	5.0	7.9	0.43	5.0	11.9
"D" Subtotal	**5.97**	**0.28**	--	--	**5.74**	**15.4**	--	**6.66**	**14.4**	--	**10.58**	**13.1**	--
1E	0.12	0.20	86	8.0	0.13	7.5	5.5	0.15	7.5	6.1	0.22	7.5	9.1
"E" Subtotal	**0.12**	**0.20**	--	--	**0.13**	**7.5**	--	**0.15**	**7.5**	--	**0.22**	**7.5**	---
Study Total	**17.81**	**0.42**	--	--	25.67	--	--	29.07	--	--	45.42	--	--

Proposed Condition													
DMA	Tributary Area (acres)	Runoff Coefficient, C	Flowpath, D (ft)	Slope, s (%)	10-Year Storm			25-Year Storm			100-Year Storm		
					Q_{10}	Tc_{10}	i_{10}	Q_{25}	Tc25	i_{25}	Q_{100}	Tc_{100}	i_{100}
					cfs	min.	in/hr	cfs	min.	in/hr	cfs	min.	in/hr
1A.1	0.03	0.69	69.00	2.8	0.15	5.0	7.1	0.16	5.0	7.9	0.25	5.0	11.9
1A.2	0.12	0.69	162.00	3.9	0.41	8.8	5.0	0.47	8.2	5.7	0.71	8.3	8.5
2A.1	0.03	0.84	49.00	1.0	0.18	5.0	7.1	0.20	5.0	7.9	0.30	5.0	11.9
2A.2	0.08	0.84	33.00	0.6	0.48	5.0	7.1	0.53	5.0	7.9	0.80	5.0	11.9
3A.1	0.08	0.84	60.00	2.0	0.48	5.0	7.1	0.53	5.0	7.9	0.80	5.0	11.9
3A.2	0.44	0.84	90.00	0.6	2.63	5.0	7.1	2.92	5.0	7.9	4.38	5.0	11.9
4A.1	0.02	0.84	60.00	1.5	0.12	5.0	7.1	0.13	5.0	7.9	0.20	5.0	11.9
4A.2	0.47	0.84	168.00	0.5	2.79	5.0	7.1	3.12	5.0	7.9	4.68	5.0	11.9
5A	0.03	0.84	47.00	2.8	0.18	5.0	7.1	0.20	5.0	7.9	0.30	5.0	11.9
6A	0.12	0.84	64.00	1.6	0.72	5.0	7.1	0.80	5.0	7.9	1.20	5.0	11.9
7A.1	0.04	0.84	60.00	2.0	0.24	5.0	7.1	0.27	5.0	7.9	0.40	5.0	11.9
7A.2	0.48	0.84	83.00	1.2	3.11	5.0	7.1	3.19	5.0	7.9	4.78	5.0	11.9
8A	0.08	0.69	81.00	6.9	0.39	5.0	7.1	0.44	5.0	7.9	0.65	5.0	11.9
9A.1	0.40	0.30	100.00	5.0	0.61	8.4	5.1	0.68	8.4	5.6	1.02	8.4	8.5
9A.2	3.57	0.30	550.00	5.5	3.62	15.9	3.4	4.10	15.4	3.8	6.34	14.7	5.9
10A.1	0.03	0.69	64.00	2.2	0.15	5.0	7.1	0.16	5.0	7.9	0.25	5.0	11.9
10A.2	0.09	0.69	71.00	2.7	0.40	5.8	6.5	0.45	5.7	7.3	0.68	5.6	11.0
"A" Subtotal	**6.10**	**0.48**	**--**	**--**	**15.35**	**5.0**	**--**	**17.18**	**5.0**	**--**	**26.27**	**5.0**	**--**
1B	0.05	0.84	36.00	1.1	0.30	5.0	7.1	0.33	5.0	7.9	0.50	5.0	11.9
2B	0.05	0.84	--	--	0.30	5.0	7.1	0.33	5.0	7.9	0.50	5.0	11.9
3B	0.04	0.84	89.00	6.9	0.24	5.0	7.1	0.27	5.0	7.9	0.40	5.0	11.9
4B	0.11	0.84	49.00	1.6	0.66	5.0	7.1	0.73	5.0	7.9	1.10	5.0	11.9
5B	0.06	0.84	54.00	4.3	0.36	5.0	7.1	0.40	5.0	7.9	0.60	5.0	11.9
6B	0.00	0.84	--	--	0.03	5.0	7.1	0.03	5.0	7.9	0.05	5.0	11.9
7B.1	0.08	0.84	80.00	3.1	0.48	5.0	7.1	0.53	5.0	7.9	0.80	5.0	11.9
7B.2	0.02	0.84	36.00	3.6	0.12	5.0	7.1	0.13	5.0	7.9	0.20	5.0	11.9
"B" Subtotal	**0.40**	**0.84**	**--**	**--**	**2.49**	**5.0**	**--**	**2.75**	**5.0**	**--**	**4.13**	**5.0**	**--**
1C.1	0.31	0.30	100.00	4.0	0.45	9.1	4.8	0.50	9.1	5.4	0.75	9.1	8.1
1C.2	1.80	0.42	380.00	7.1	2.70	14.5	3.6	3.03	14.3	4.0	4.75	13.4	6.3
1C.3	0.50	0.83	385.00	2.6	1.37	16.4	3.3	1.54	16.1	3.7	2.42	15.1	5.8
2C	0.59	0.84	--	--	1.61	5.0	3.3	1.81	5.0	3.7	2.84	5.0	5.7
3C.1	0.04	0.87	90.00	5.1	0.25	5.0	7.1	0.28	5.0	7.9	0.41	5.0	11.9
3C.2	0.32	0.84	297.00	2.0	1.91	5.0	7.1	2.12	5.0	7.9	3.19	5.0	11.9
4C.1	0.03	0.87	60.00	8.5	0.19	5.0	7.1	0.21	5.0	7.9	0.31	5.0	11.9
4C.2	0.01	0.87	70.00	9.0	0.06	5.0	7.1	0.07	5.0	7.9	0.10	5.0	11.9
5C	0.44	0.84	--	--	1.19	5.0	3.2	1.33	5.0	3.6	2.09	5.0	5.6
6C.1	0.11	0.84	53.00	1.1	0.66	5.0	7.1	0.73	5.0	7.9	1.10	5.0	11.9
6C.2	0.35	0.84	188.00	1.1	2.09	5.0	7.1	2.32	5.0	7.9	3.49	5.0	11.9
7C	0.24	0.84	--	--	1.43	5.0	7.1	1.59	5.0	7.9	2.39	5.0	11.9
8C	0.33	0.83	--	--	0.87	5.0	3.2	0.97	5.0	3.6	1.53	5.0	5.6
9C.1	0.02	0.83	60.00	2.0	0.12	5.0	7.1	0.13	5.0	7.9	0.20	5.0	11.9
9C.2	0.11	0.83	129.00	0.8	0.65	5.0	7.1	0.72	5.0	7.9	1.08	5.0	11.9
"C" Subtotal	**5.21**	**0.41**	**--**	**--**	**11.30**	**5.0**	**--**	**12.68**	**5.0**	**--**	**19.82**	**5.0**	**--**

1D.1	0.57	0.30	100.00	23.0	1.01	6.7	5.9	1.12	6.7	6.6	1.68	6.7	9.8
1D.2	5.18	0.27	651.00	9.4	4.91	15.0	3.5	5.70	14.0	4.1	9.07	12.8	6.5
1D.3	0.10	0.48	181.00	5.6	0.17	15.2	3.5	0.19	14.2	4.0	0.31	13.0	6.4
2D	0.12	0.30	22.00	4.5	0.26	5.0	7.1	0.28	5.0	7.9	0.43	5.0	11.9
"D" Subtotal	**5.97**	**0.28**	**--**	**--**	**5.74**	**15.4**	**--**	**6.66**	**14.4**	**--**	**10.58**	**13.1**	**--**
1E	0.12	0.20	86.00	8.0	0.13	7.5	5.5	0.15	7.5	6.1	0.22	7.5	9.1
"E" Subtotal	**0.12**	**0.20**	**--**	**--**	**0.13**	**7.5**	**--**	**0.15**	**7.5**	**--**	**0.22**	**7.5**	**--**
Site Total	**17.81**	**0.38**	**--**	**--**	**35.01**	**--**	**--**	**39.42**	**--**	**--**	**61.02**	**--**	**--**

Comparing the runoff discharged from the overall Site Total in the existing and proposed conditions without flow control, the stormwater runoff will be increased by 9.3 cfs in the 10-year storm event, 10.4 cfs in the 25-year storm event and 15.6 cfs in the 100-year storm event. The table below summarizes the change in runoff without mitigation for the overall Site Total.

	Q_{10} (cfs)	Q_{25} (cfs)	Q_{100} (cfs)
Existing	25.67	29.07	45.42
Proposed	35.01	39.42	61.02
Difference	9.34	10.35	15.60
Change in %	36.4%	35.6%	34.3%

Since no changes are made to either DMA-D and DMA-E, comparisons in runoff are only made for DMA-A, DMA-B and DMA-C.

	DMA-A		DMA-B		DMA-C	
	Q_{10} (cfs)	Q_{25} (cfs)	Q_{10} (cfs)	Q_{25} (cfs)	Q_{10} (cfs)	Q_{25} (cfs)
Existing	6.60	7.48	2.64	2.93	10.56	11.85
Proposed	15.35	17.18	2.49	2.75	11.30	12.68
Difference	8.75	9.70	-0.15	-0.18	0.74	0.83

When comparing the existing versus proposed 10-year and 25-year runoff results, DMA-A has a significant increase in runoff whereas DMA-B has a slight decrease and DMA-C has a slight increase. Since discharge from DMA-A and DMA-C will be mitigated and all DMAs are tributary to the same downstream drainage system, there will be no increase in runoff from the overall site.

Underground detention systems in DMA-A and DMA-C with controlled outlets are proposed to temporarily detain stormwater runoff onsite and are designed to discharge runoff in the amount less or equal to the existing condition into the downstream drainage system.

Hydromodification/Mitigated Flow Analysis

For the 100-year storm event, Rick Engineering Company Rational Method Hydrograph software was used to generate the 100-year rational method hydrograph data for the existing and proposed Site conditions. The 100-year rational method hydrograph data and the proposed detention system data were

inputted into Civil 3D Hydraflow Hydrographs software to generate the pre-developed and mitigated flows from each underground detention system.

To mitigate the increase in runoff in DMA-A and DMA-C, a manhole with outflow control is proposed immediately downstream of both System #1 and System #2 to keep runoff discharged less than the existing condition. Both underground detention systems are sized to detain runoff generated from a 100-year storm event with discharged runoff less than the allowable Q.

Since the runoff generated from DMA-B does not increase in proposed condition, the existing underground detention system in DMA-B will remain the same.

Below are calculations to determine the allowable runoff for both underground detention systems.

- Allowable Q_{100} to discharge from proposed underground detention system (System #1) in DMA-A:

  Areas tributary to System #1: subareas 2A thru 7A

  Total runoff entering System #1 $Q_{100\text{-inflow}}$ = 16.78 cfs

  Other subareas bypass System #1 and discharges directly to POC #1.

  Drainage areas bypassing System #1: 1A.1 & 1A.2, 8A, 9A.1 & 9A.2, and 10A.1 & 10A.2

  Total runoff bypassing System #1 $Q_{100\text{-bypass}}$ = 0.88 cfs + 0.65 cfs + 7.05 cfs + 0.91 cfs = 9.49 cfs

  Existing Q_{100} discharged from DMA-A = 11.63 cfs

  Allowable runoff to discharge from System #1 $Q_{100\text{-allowable}}$ = 11.63 cfs – 9.49 cfs = 2.14 cfs

- Allowable Q_{100} to discharge from proposed underground detention system (System #2) in DMA-C:

  Areas tributary to System #2: subareas 1C thru 8C

  Total runoff entering System #2 $Q_{100\text{-inflow}}$ = 18.54 cfs

  Other subareas bypass System #2 and discharges directly to POC #2.

  Drainage areas bypassing System #2: 9C.1 & 9C.2

  Total runoff bypassing System #2 $Q_{100\text{-bypass}}$ = 1.28 cfs

  Existing Q_{100} Discharged from DMA-C = 18.58 cfs

  Allowable runoff to discharge from System #2 $Q_{100\text{-allowable}}$ = 18.58 cfs – 1.28 cfs = 17.30 cfs

The sizes of the outlet control for the two underground detention systems are summarized below:

	Size of Weir Structure	Size of Orifice Structure
System #1	0.67’ wide x 0.80’ high	3” diameter at bottom of System #1
System #2	1.00’ wide x 2.75’ high	6” diameter at bottom of System #2

With the outflow control proposed at each system, the results yielded from Hydraflow Hydrographs are shown below and shown in Appendix E.

	System #1 Outflow (cfs)	System #2 Outflow (cfs)
Mitigated	2.12	17.25

Total runoff discharged at each POC is tabulated below. Since the runoff discharged from each POC decreases, the proposed development will not have negative impact to downstream storm drain system or other flood control facilities.

	Pre-development Q_{100} (cfs)	Post-development Q_{100} (cfs)	Tributary DMA	Note for Post-development Q_{100}
POC#1	16.04	15.74	A and B	7.05 cfs from 9A.1 & 9A.2 2.44 cfs from 1A.1 & 1A.2, 8A, and 10A.1 & 10A.2 2.12 cfs from System #1 4.13 cfs from DMA-B
POC#2	18.58	18.53	C and D	17.25 cfs from System #2 1.28 cfs from 9C.1 & 9C.2

Point of Discharge (POC) Erosion

Because the stormwater runoff discharged at each POC is reduced, erosion to the existing concrete ditch and dissipater is not expected.

SECTION VII

Declaration of Responsible Charge

I hereby declare that I am the engineer of work for this project, that I have exercised responsible charge over the design of the project as defined in Section 6703 of the Business and Professions Code, and that the design is consistent with current standards.

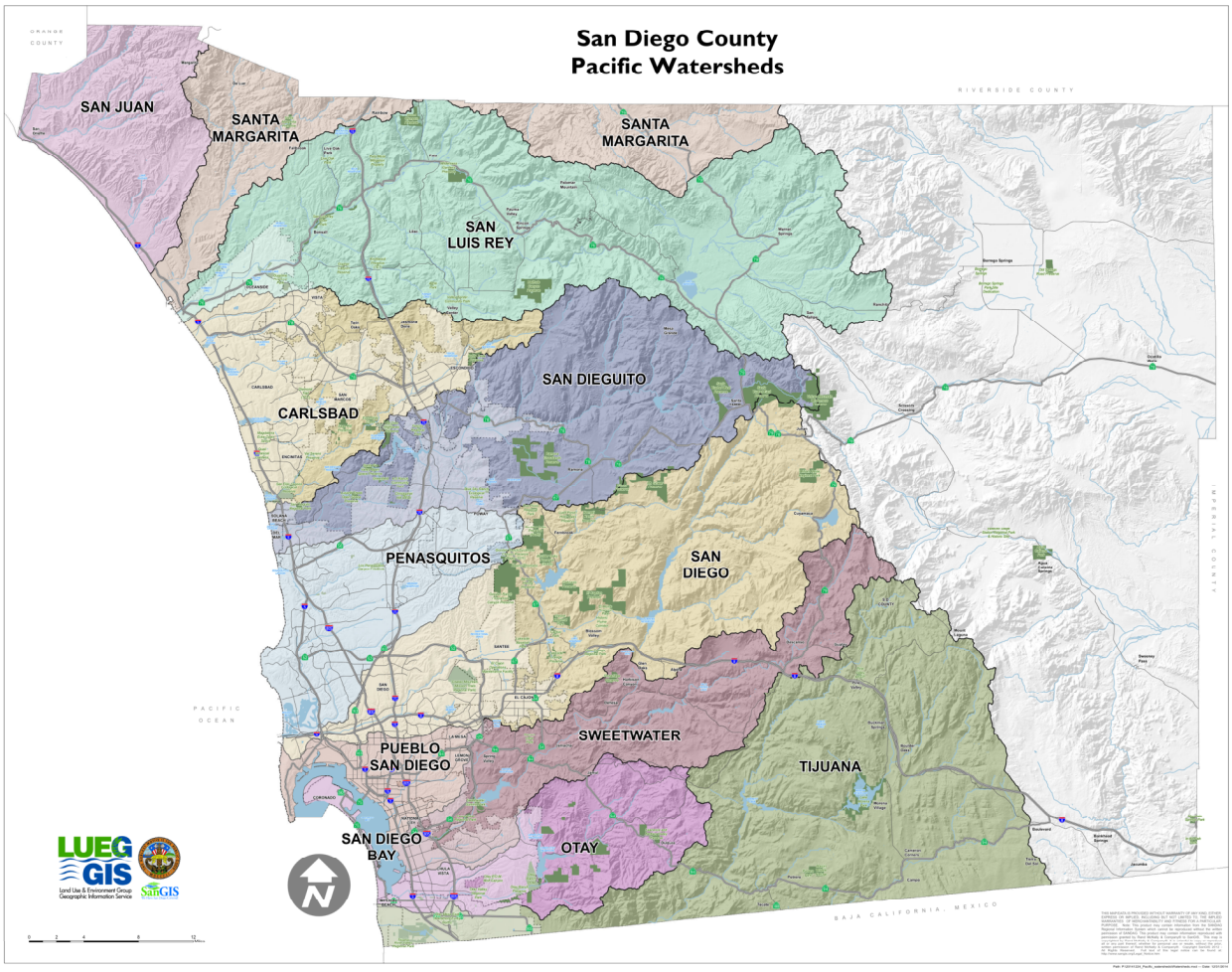
I understand that the check of project drawings and specifications by the County of San Diego is confined to a review only and does not relieve me, as engineer of work, of my responsibilities for project design.

5/27/2021

Gregory R. Cooke, R.C.E. 39478 Date

SECTION VIII

Watershed Boundary/Topographic Map



SECTION IX

Watershed Information

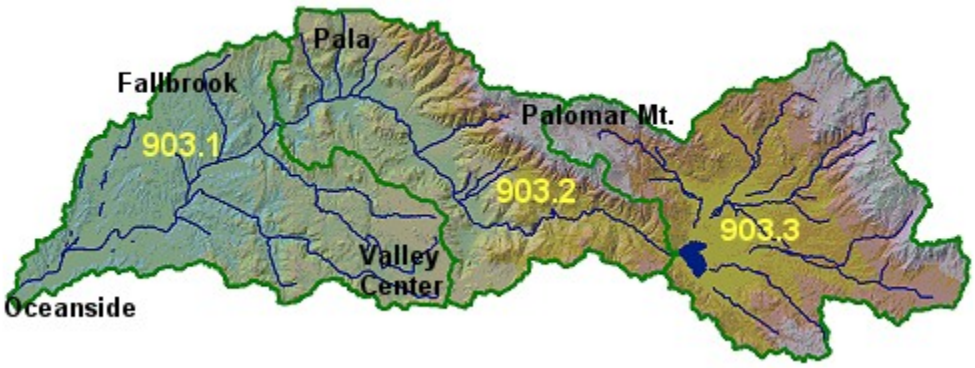
The project site is located within the lower San Luis Rey Hydrologic Area (HA) in the San Luis Rey Watershed.

The San Luis Rey Watershed Management Area (WMA) encompasses 560 square miles and lies in the northern portion of the San Diego County and neighbors Santa Margarita Watershed to the north and Carlsbad and San Dieguito Watersheds to the south. It can be further subdivided into three hydrological areas: Lower San Luis Rey, Monserate, and Warner Valley.

San Luis Rey Watershed supplies area residents with potable water source from Turner Reservoir and Lake Henshaw as well as a number of underground aquifers. The WMA also has six groundwater aquifers: Warner, Pauma, Pala, Bonsall, Moosa, and Mission Basins.

SECTION X

Watershed Geometric Information Map



SECTION XI

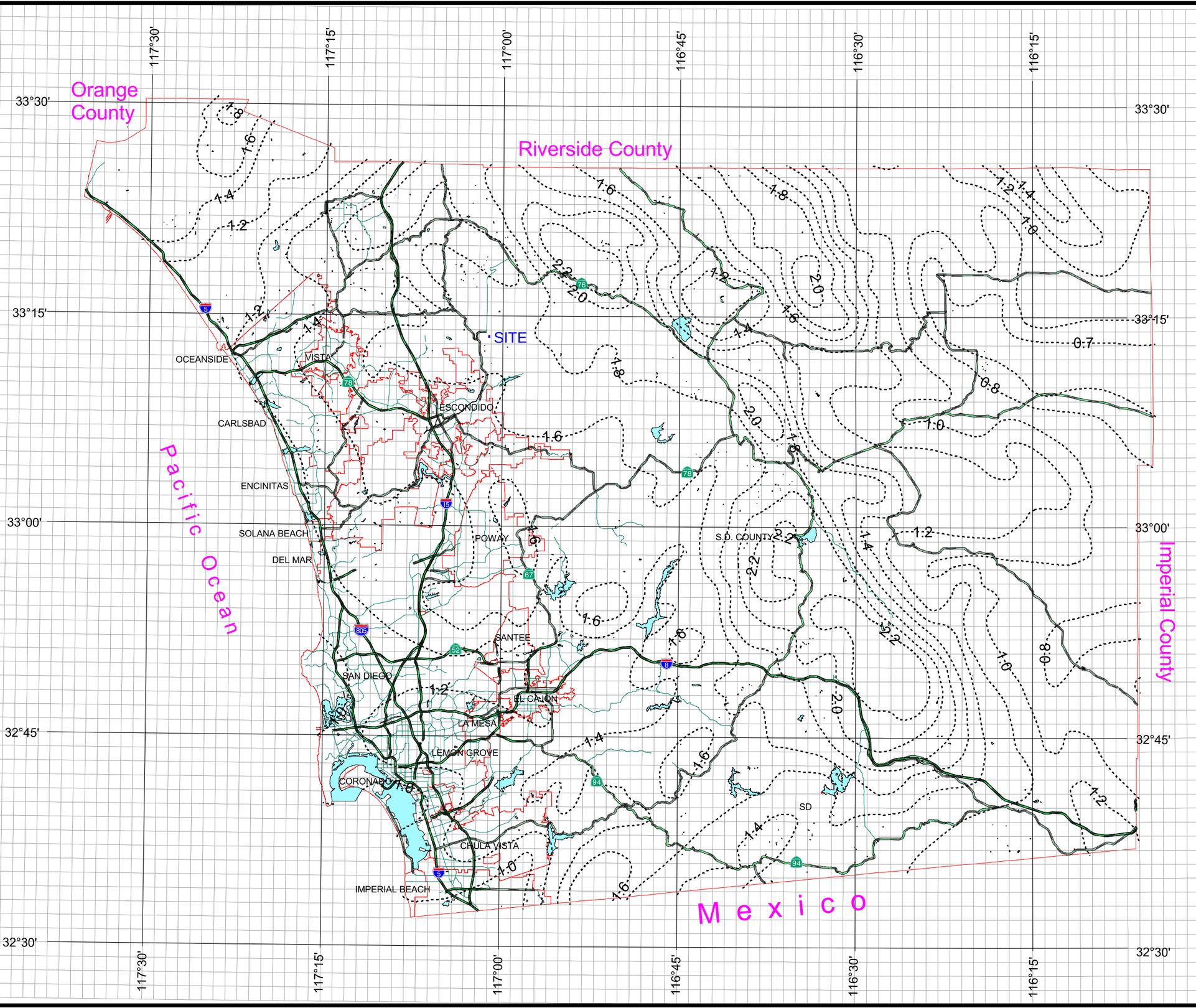
Watershed Point Rainfall Isohyetal Maps

County of San Diego Hydrology Manual

Rainfall Isopluvials

2 Year Rainfall Event - 6 Hours

---------- Isopluvial (inches)



N W E S

3 0 3 Miles

County of San Diego Hydrology Manual

Rainfall Isopluvials

2 Year Rainfall Event - 24 Hours

---------- Isopluvial (inches)

Orange County

Riverside County

Imperial County

Pacific Ocean

Mexico

SITE

OCEANSIDE
VISTA
CARLSBAD
ESCONDIDO
ENCINITAS
SOLANA BEACH
DEL MAR
POWAY
S.D. COUNTY
SANTEE
SAN DIEGO
EL CAJON
LA MESA
LEMON GROVE
CORONADO
CHULA VISTA
IMPERIAL BEACH
SD

117°30' 117°15' 117°00' 116°45' 116°30' 116°15'

33°30' 33°15' 33°00' 32°45' 32°30'

DPW GIS
Department of Public Works
Geographic Information Services

SanGIS
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N
W E
S

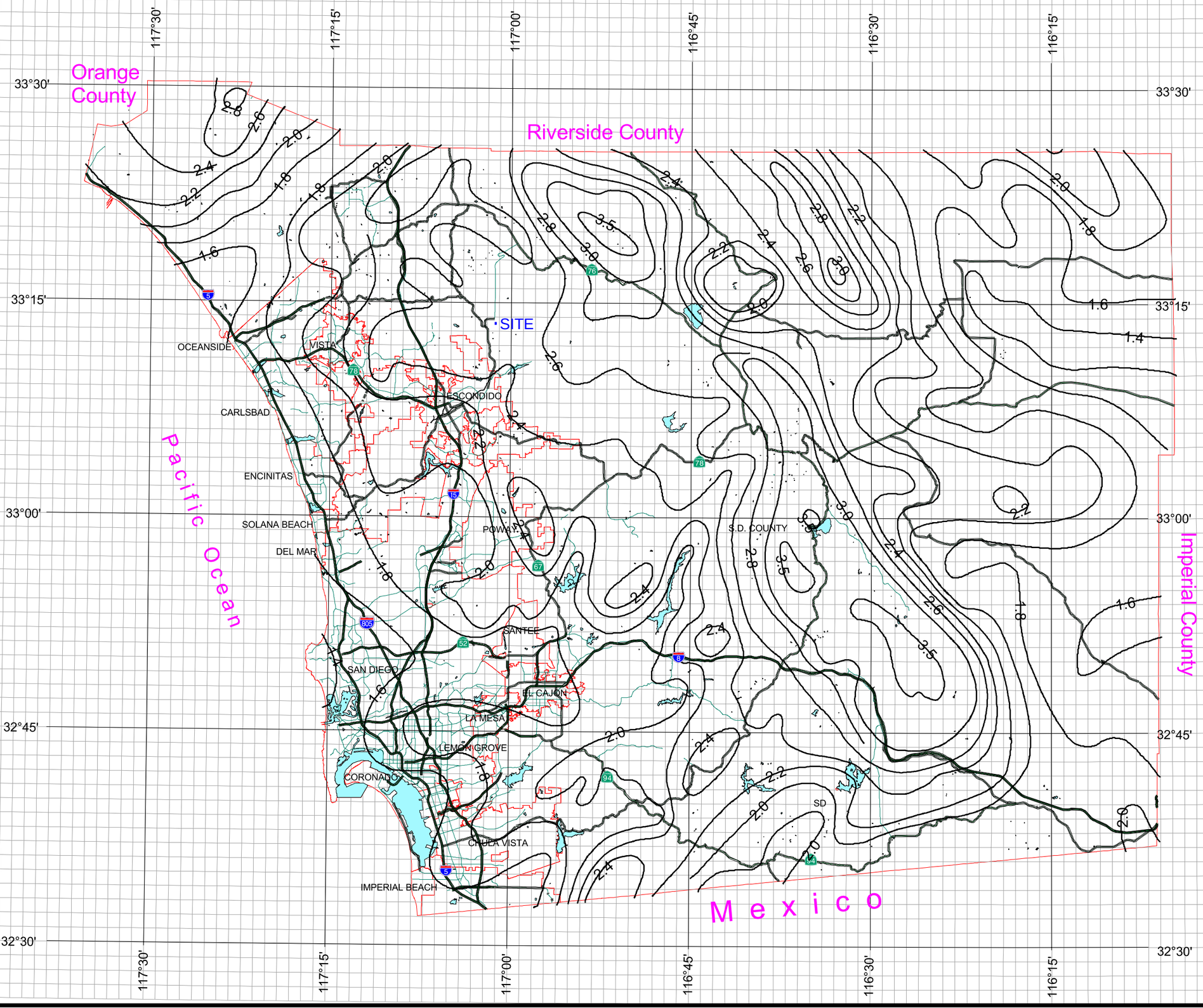
3 0 3 Miles

County of San Diego Hydrology Manual

Rainfall Isopluvials

10 Year Rainfall Event - 6 Hours

Isopluvial (inches)



DPW GIS
Department of Public Works
Geographic Information Services

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N
W E
S

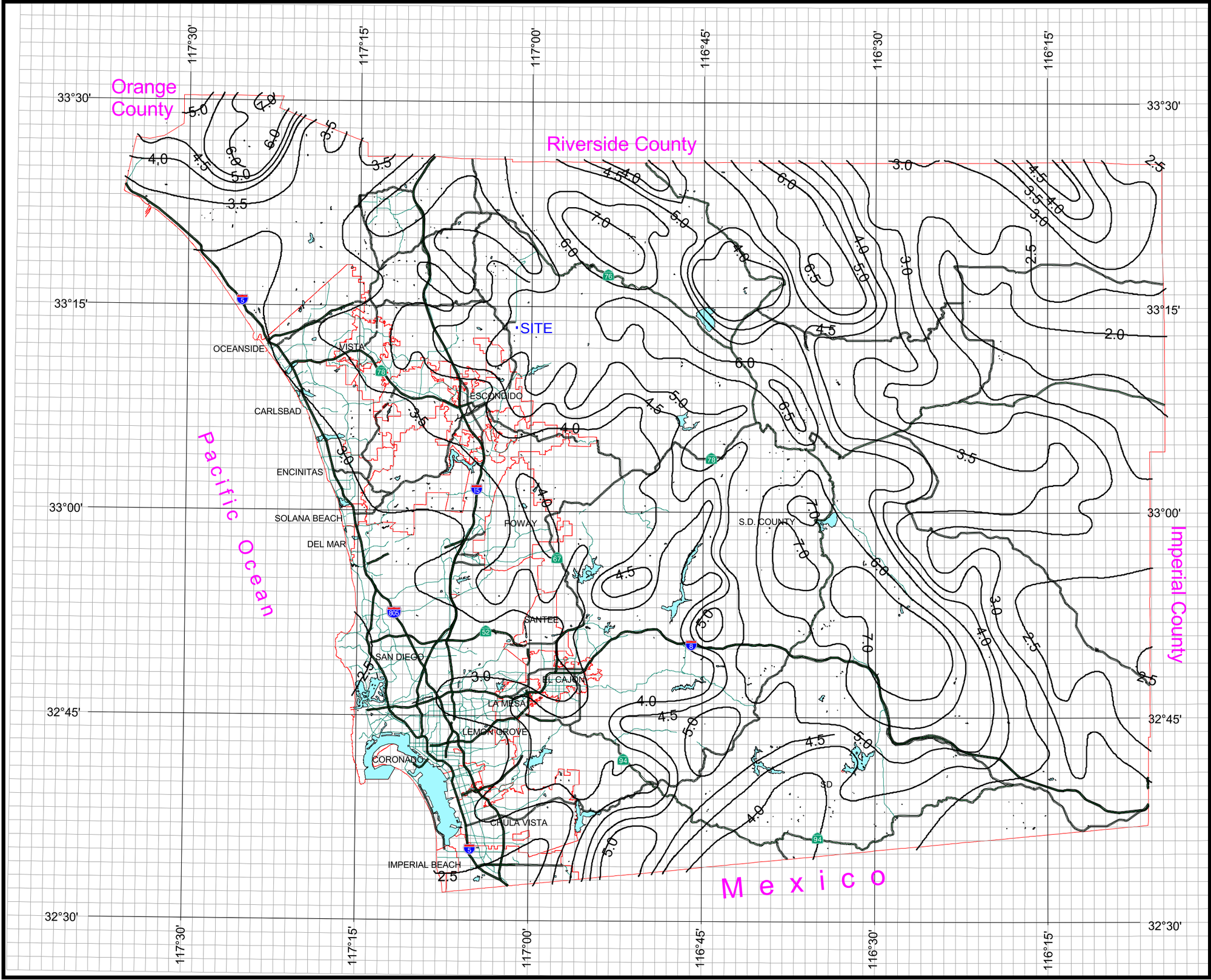
3 0 3 Miles

County of San Diego Hydrology Manual

Rainfall Isopluvials

10 Year Rainfall Event - 24 Hours

Isopluvial (inches)



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Geographic Information Services

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N W E S

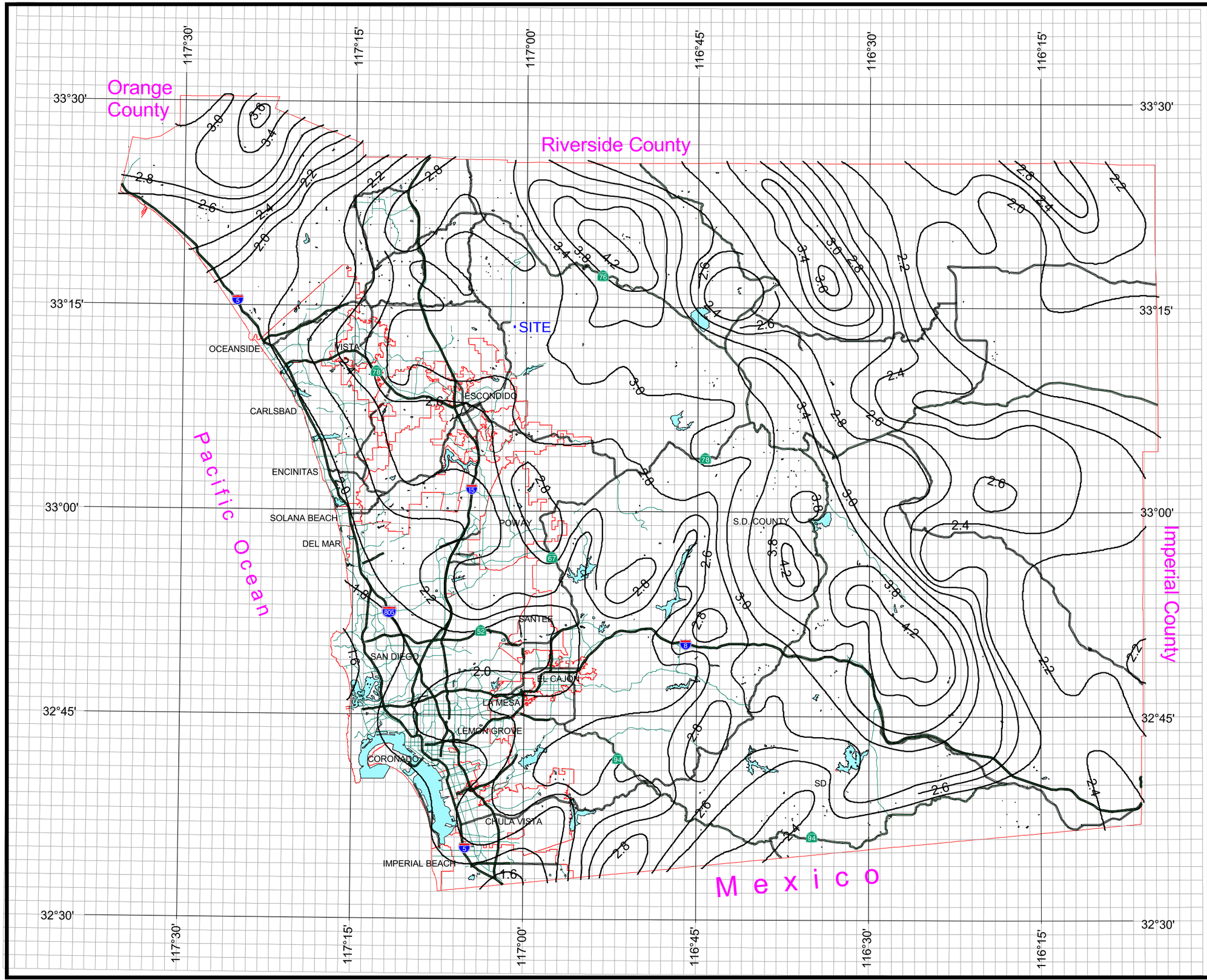
3 0 3 Miles

County of San Diego Hydrology Manual

Rainfall Isopluvials

25 Year Rainfall Event - 6 Hours

Isopluvial (inches)



N W E S

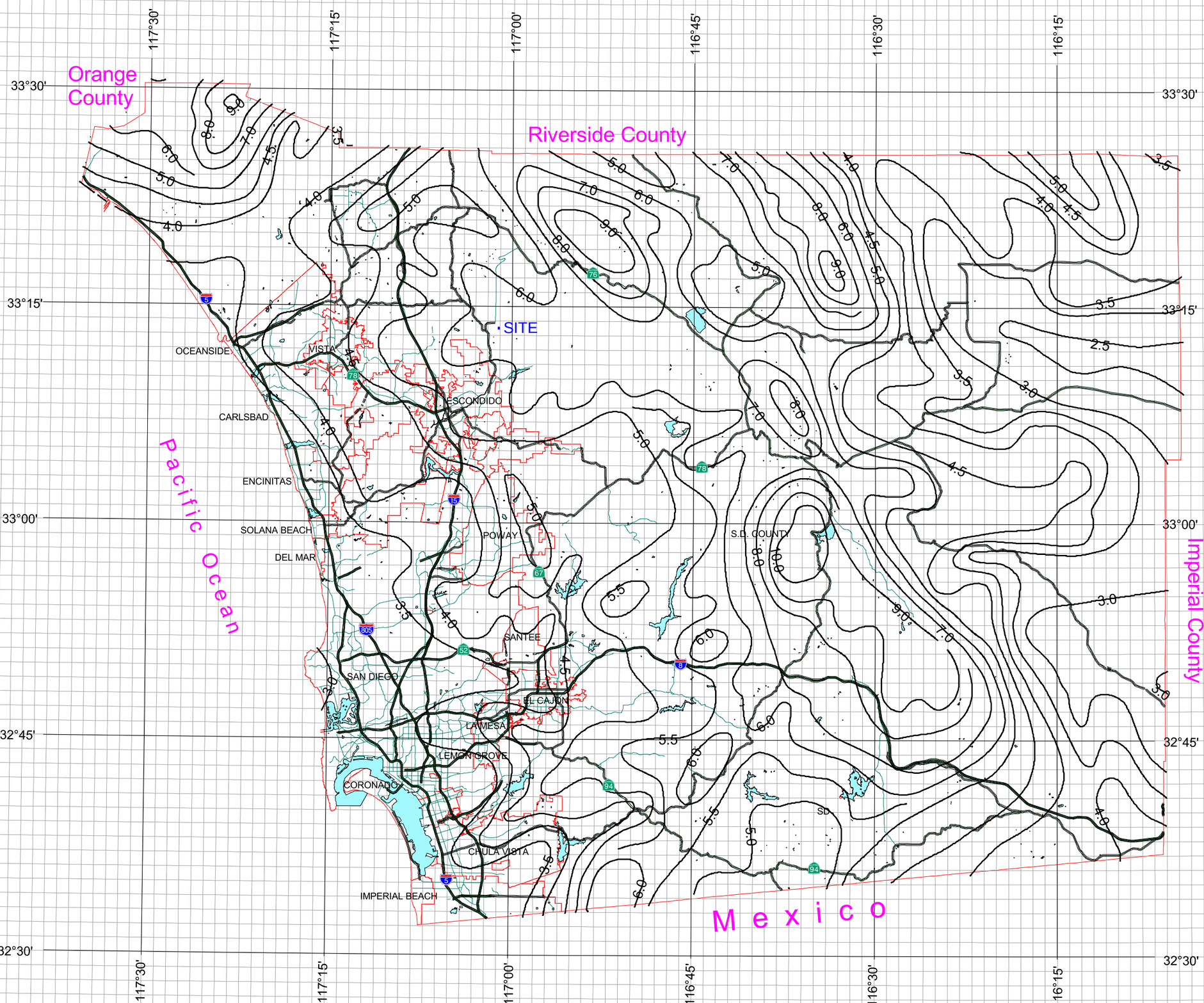
3 0 3 Miles

County of San Diego Hydrology Manual

Rainfall Isopluvials

25 Year Rainfall Event - 24 Hours

Isopluvial (inches)



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Geographic Information Services

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N
W E
S

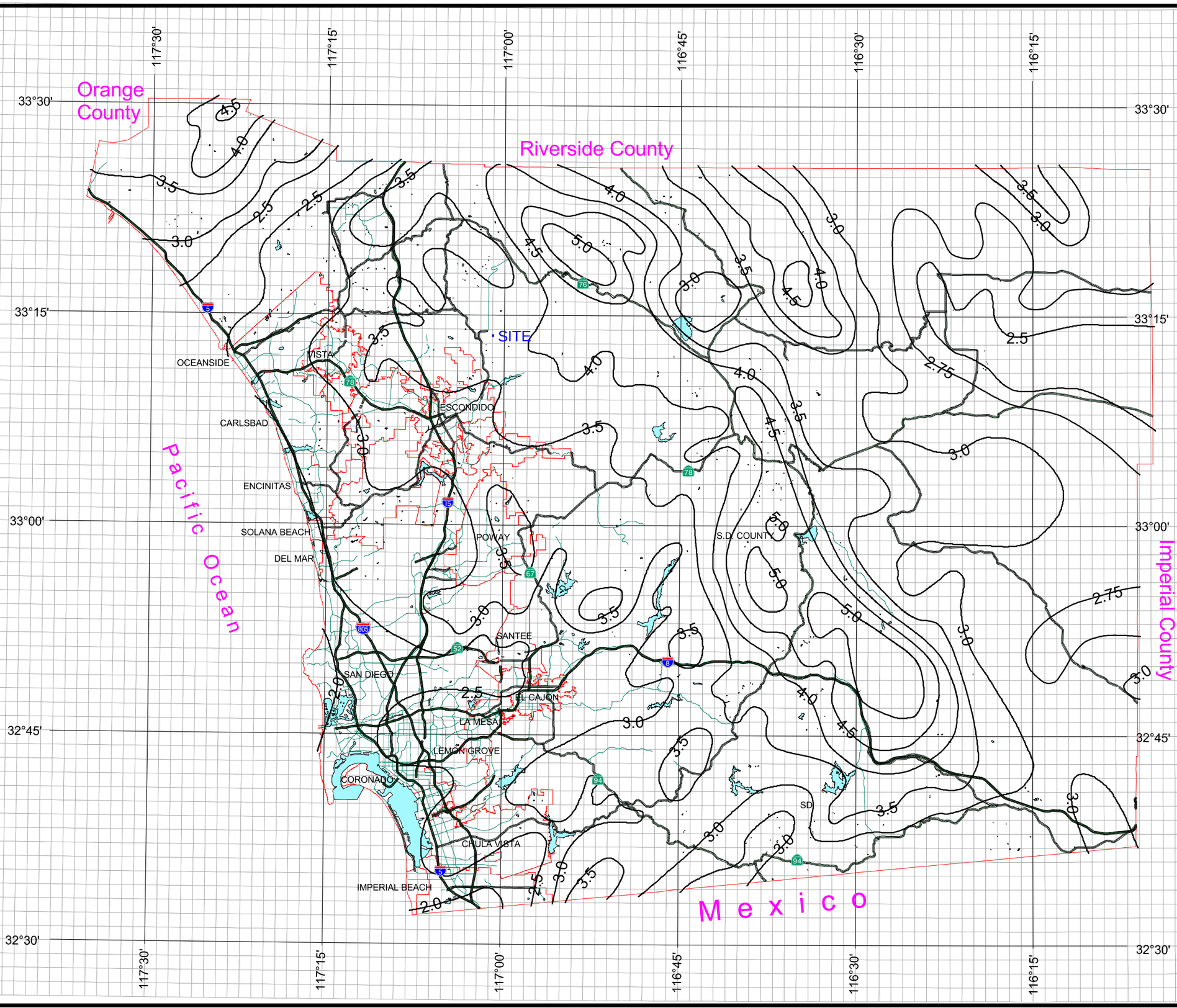
3 0 3 Miles

County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 6 Hours

Isopluvial (inches)



DPW GIS
Department of Public Works
Geographic Information Services

SanGIS
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N
W E
S

3 0 3 Miles

County of San Diego Hydrology Manual

Rainfall Isopluvials

100 Year Rainfall Event - 24 Hours

Isopluvial (inches)

Orange County

Riverside County

Imperial County

Pacific Ocean

Mexico

SITE

OCEANSIDE

VISTA

CARLSBAD

ESCONDIDO

ENCINITAS

SOLANA BEACH

POWAY

S.D. COUNTY

DEL MAR

SANTEE

SAN DIEGO

EL CAJON

LA MESA

LEMON GROVE

CORONADO

CHULA VISTA

IMPERIAL BEACH

SD

117°30'

117°15'

117°00'

116°45'

116°30'

116°15'

33°30'

33°15'

33°00'

32°45'

32°30'

N W E S

3 0 3 Miles

APPENDIX A

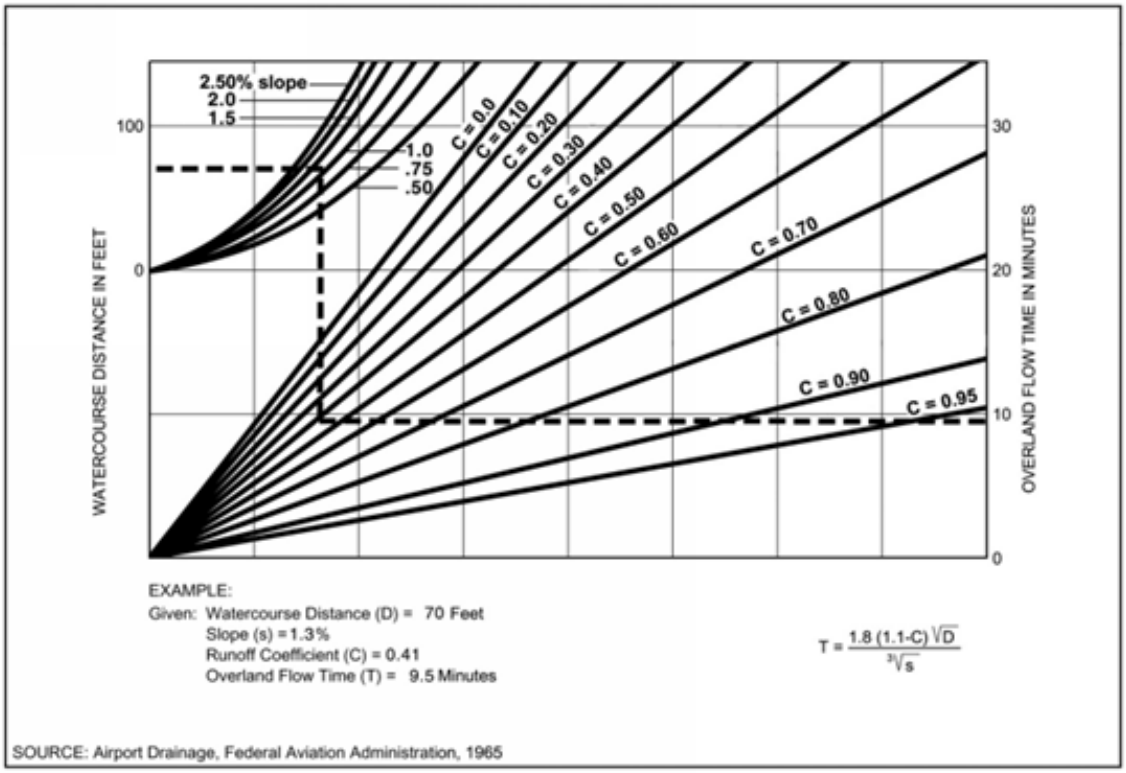
Intensity-Duration Design Charts

Table 3-2

MAXIMUM OVERLAND FLOW LENGTH (L_M) & INITIAL TIME OF CONCENTRATION (T_i)

Element*	DU/ Acre	.5%		1%		2%		3%		5%		10%	
		L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i	L_M	T_i
Natural		50	13.2	70	12.5	85	10.9	100	10.3	100	8.7	100	6.9
LDR	1	50	12.2	70	11.5	85	10.0	100	9.5	100	8.0	100	6.4
LDR	2	50	11.3	70	10.5	85	9.2	100	8.8	100	7.4	100	5.8
LDR	2.9	50	10.7	70	10.0	85	8.8	95	8.1	100	7.0	100	5.6
MDR	4.3	50	10.2	70	9.6	80	8.1	95	7.8	100	6.7	100	5.3
MDR	7.3	50	9.2	65	8.4	80	7.4	95	7.0	100	6.0	100	4.8
MDR	10.9	50	8.7	65	7.9	80	6.9	90	6.4	100	5.7	100	4.5
MDR	14.5	50	8.2	65	7.4	80	6.5	90	6.0	100	5.4	100	4.3
HDR	24	50	6.7	65	6.1	75	5.1	90	4.9	95	4.3	100	3.5
HDR	43	50	5.3	65	4.7	75	4.0	85	3.8	95	3.4	100	2.7
N. Com		50	5.3	60	4.5	75	4.0	85	3.8	95	3.4	100	2.7
G. Com		50	4.7	60	4.1	75	3.6	85	3.4	90	2.9	100	2.4
O.P./Com		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
Limited I.		50	4.2	60	3.7	70	3.1	80	2.9	90	2.6	100	2.2
General I.		50	3.7	60	3.2	70	2.7	80	2.6	90	2.3	100	1.9

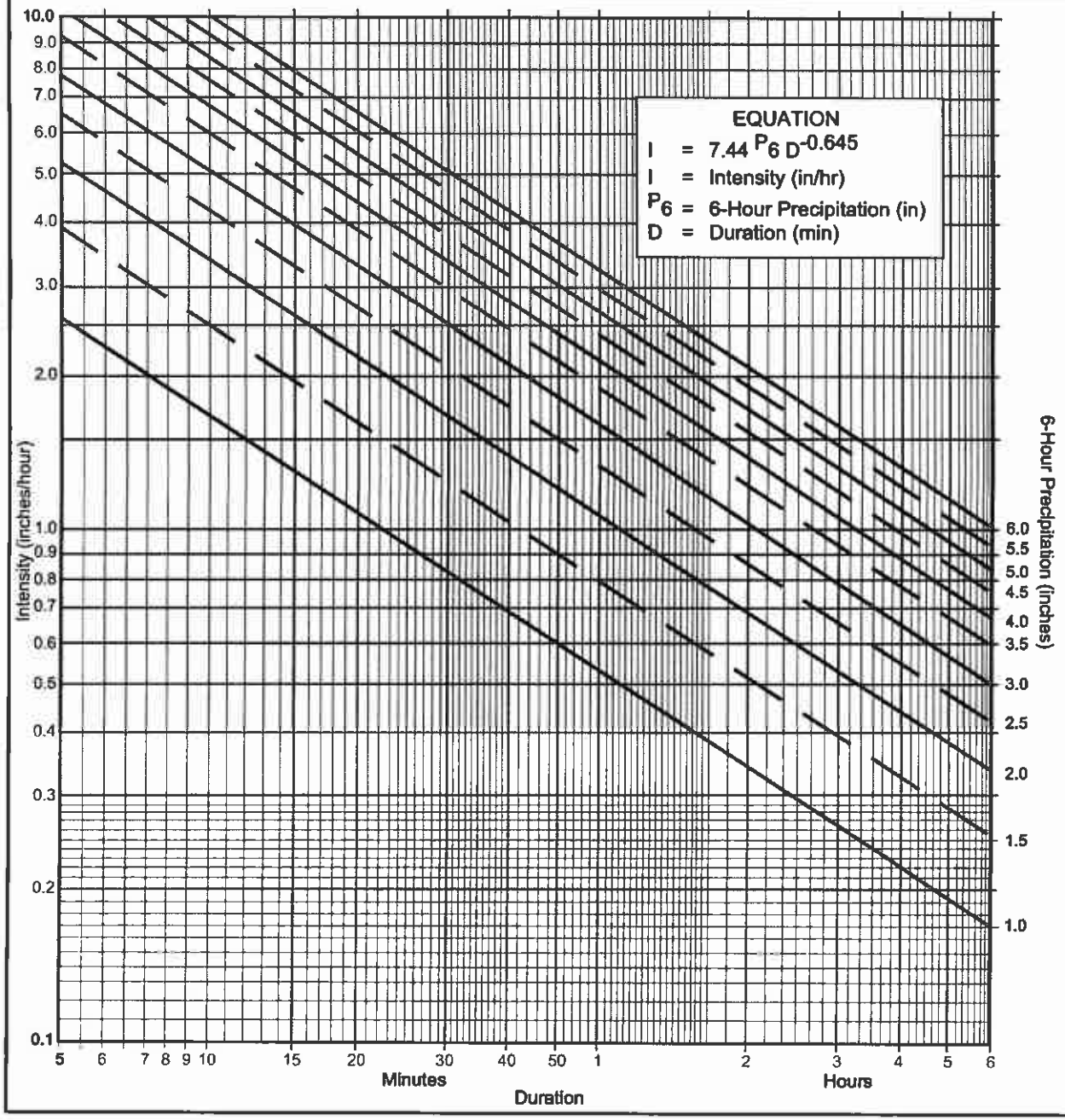
*See Table 3-1 for more detailed description



SOURCE: Airport Drainage, Federal Aviation Administration, 1965

Rational Formula - Overland Time of Flow Nomograph

FIGURE 3-3



Directions for Application:

(1) From precipitation maps determine 6 hr and 24 hr amounts for the selected frequency. These maps are included in the County Hydrology Manual (10, 50, and 100 yr maps included in the Design and Procedure Manual).

(2) Adjust 6 hr precipitation (if necessary) so that it is within the range of 45% to 65% of the 24 hr precipitation (not applicaple to Desert).

(3) Plot 6 hr precipitation on the right side of the chart.

(4) Draw a line through the point parallel to the plotted lines.

(5) This line is the intensity-duration curve for the location being analyzed.

Application Form:

(a) Selected frequency 2 year

(b) P_6 = 1.8 In., P_{24} = 3.0 $\frac{P_6}{P_{24}}$ = 60 %(2)

(c) Adjusted P_6(2) = 1.8 in.

(d) t_x = * min.

(e) I = * in./hr.

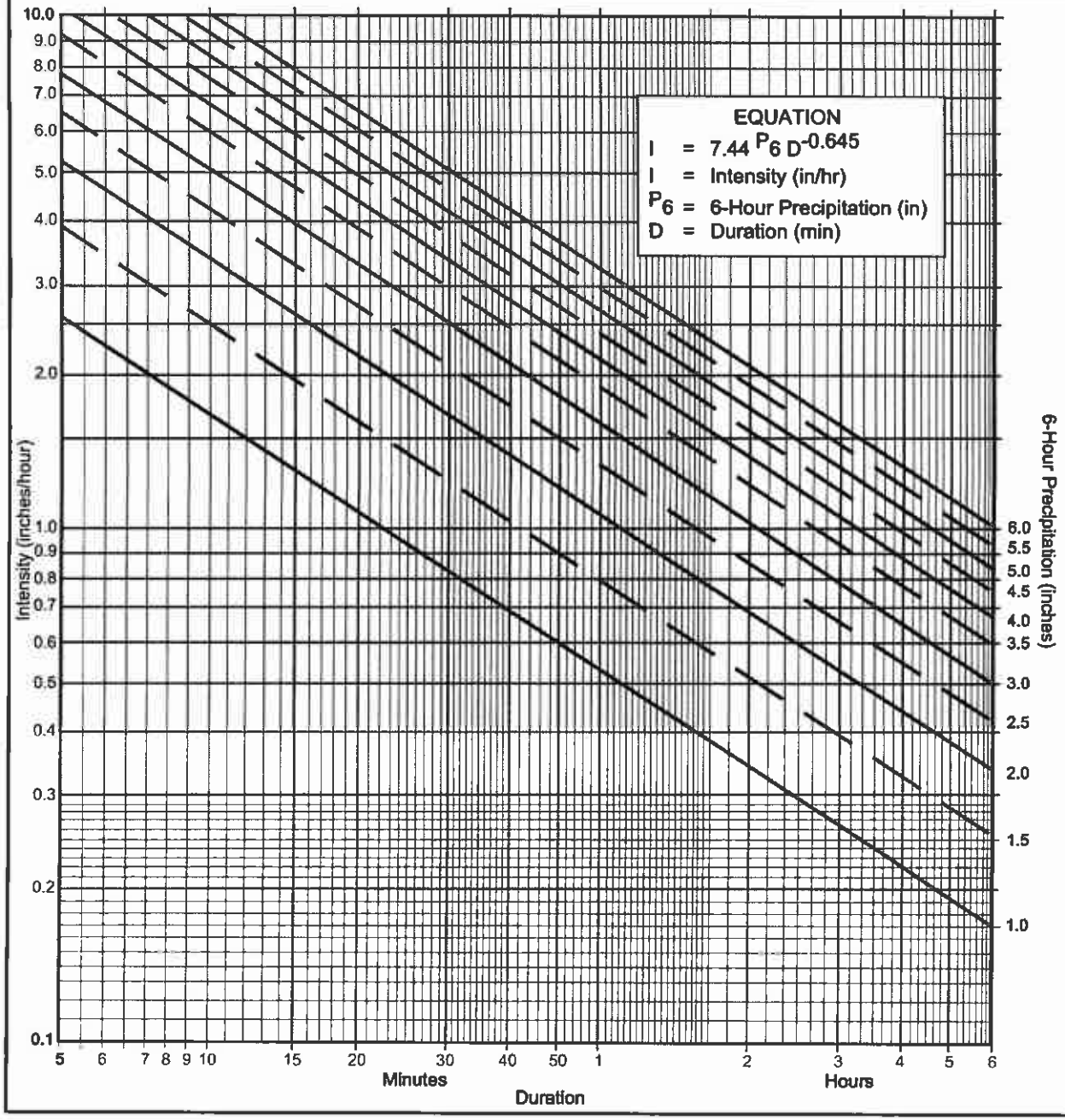
*Calculated with AES software, as described by the methods in Section III of this Drainage Study. Results are tabulated in Section VI.

Note: This chart replaces the Intensity-Duration-Frequency curves used since 1965.

P6	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
Duration	I	I	I	I	I	I	I	I	I	I	I
5	2.63	3.95	5.27	6.59	7.90	9.22	10.54	11.86	13.17	14.49	15.81
7	2.12	3.18	4.24	5.30	6.36	7.42	8.48	9.54	10.60	11.66	12.72
10	1.68	2.53	3.37	4.21	5.05	5.90	6.74	7.58	8.42	9.27	10.11
15	1.30	1.95	2.59	3.24	3.89	4.54	5.19	5.84	6.49	7.13	7.78
20	1.08	1.62	2.15	2.69	3.23	3.77	4.31	4.85	5.39	5.93	6.46
25	0.93	1.40	1.87	2.33	2.80	3.27	3.73	4.20	4.67	5.13	5.60
30	0.83	1.24	1.66	2.07	2.49	2.90	3.32	3.73	4.15	4.56	4.98
40	0.69	1.03	1.38	1.72	2.07	2.41	2.76	3.10	3.45	3.79	4.13
50	0.60	0.90	1.19	1.49	1.79	2.09	2.39	2.69	2.98	3.28	3.58
60	0.53	0.80	1.06	1.33	1.59	1.86	2.12	2.39	2.65	2.92	3.18
90	0.41	0.61	0.82	1.02	1.23	1.43	1.63	1.84	2.04	2.25	2.45
120	0.34	0.51	0.68	0.85	1.02	1.19	1.36	1.53	1.70	1.87	2.04
150	0.29	0.44	0.59	0.73	0.88	1.03	1.18	1.32	1.47	1.62	1.76
180	0.26	0.39	0.52	0.65	0.78	0.91	1.04	1.18	1.31	1.44	1.57
240	0.22	0.33	0.43	0.54	0.65	0.76	0.87	0.98	1.08	1.19	1.30
300	0.19	0.28	0.38	0.47	0.56	0.66	0.75	0.85	0.94	1.03	1.13
360	0.17	0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.84	0.92	1.00

Intensity-Duration Design Chart - Template

FIGURE 3-1



Directions for Application:

(1) From precipitation maps determine 6 hr and 24 hr amounts for the selected frequency. These maps are included in the County Hydrology Manual (10, 50, and 100 yr maps included in the Design and Procedure Manual).

(2) Adjust 6 hr precipitation (if necessary) so that it is within the range of 45% to 65% of the 24 hr precipitation (not applicaple to Desert).

(3) Plot 6 hr precipitation on the right side of the chart.

(4) Draw a line through the point parallel to the plotted lines.

(5) This line is the intensity-duration curve for the location being analyzed.

Application Form:

(a) Selected frequency 10 year

(b) P_6 = 2.6 In., P_{24} = 6.0 $\frac{P_6}{P_{24}}$ = 43 %(2)

(c) Adjusted P_6(2) = 2.7 in.

(d) t_x = * min.

(e) I = * in./hr.

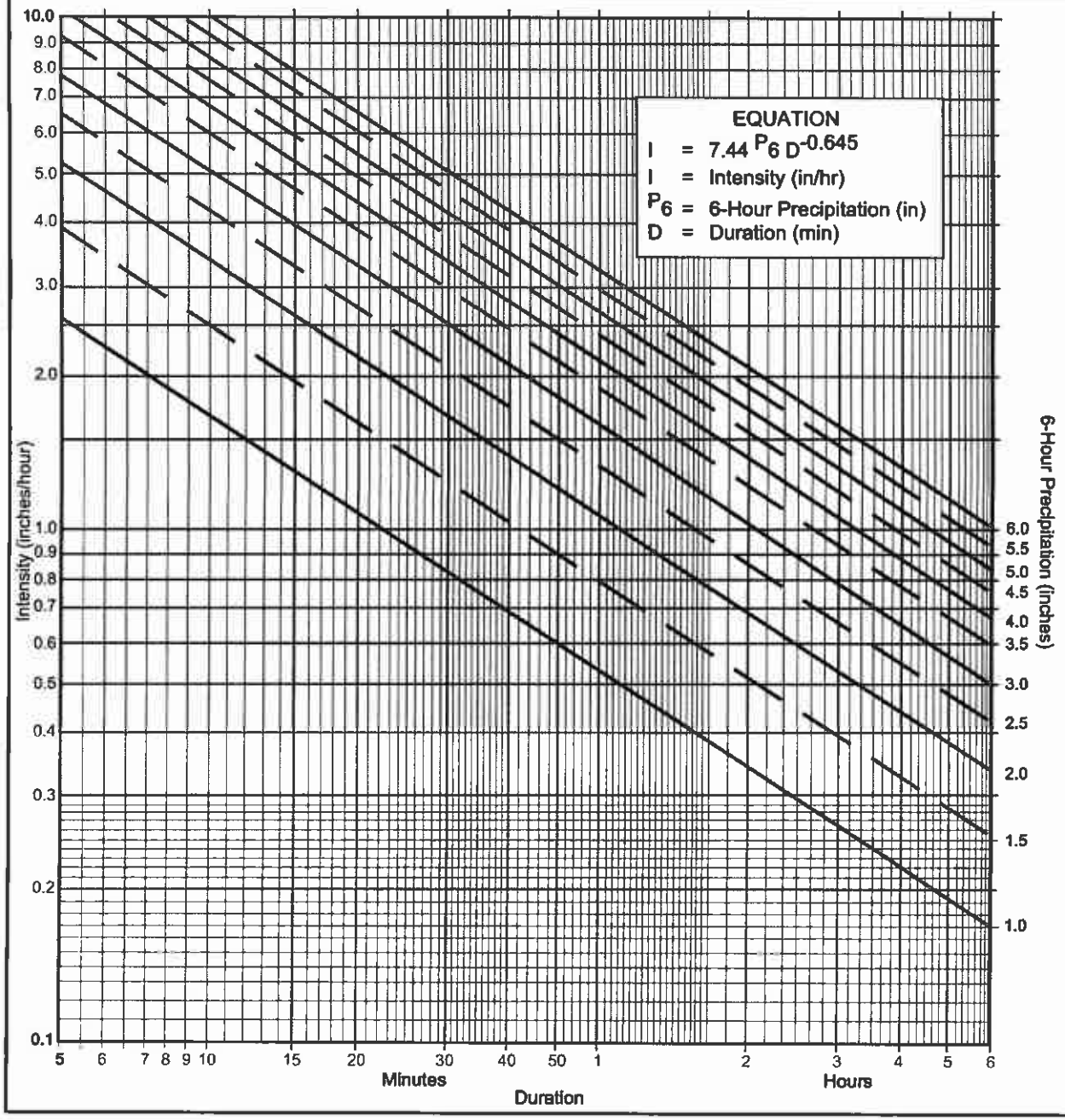
*Calculated with AES software, as described by the methods in Section III of this Drainage Study. Results are tabulated in Section VI.

Note: This chart replaces the Intensity-Duration-Frequency curves used since 1965.

P6	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
Duration	I	I	I	I	I	I	I	I	I	I	I
5	2.63	3.95	5.27	6.59	7.90	9.22	10.54	11.86	13.17	14.49	15.81
7	2.12	3.18	4.24	5.30	6.36	7.42	8.48	9.54	10.60	11.66	12.72
10	1.68	2.53	3.37	4.21	5.05	5.90	6.74	7.58	8.42	9.27	10.11
15	1.30	1.95	2.59	3.24	3.89	4.54	5.19	5.84	6.49	7.13	7.78
20	1.08	1.62	2.15	2.69	3.23	3.77	4.31	4.85	5.39	5.93	6.46
25	0.93	1.40	1.87	2.33	2.80	3.27	3.73	4.20	4.67	5.13	5.60
30	0.83	1.24	1.66	2.07	2.49	2.90	3.32	3.73	4.15	4.56	4.98
40	0.69	1.03	1.38	1.72	2.07	2.41	2.76	3.10	3.45	3.79	4.13
50	0.60	0.90	1.19	1.49	1.79	2.09	2.39	2.69	2.98	3.28	3.58
60	0.53	0.80	1.06	1.33	1.59	1.86	2.12	2.39	2.65	2.92	3.18
90	0.41	0.61	0.82	1.02	1.23	1.43	1.63	1.84	2.04	2.25	2.45
120	0.34	0.51	0.68	0.85	1.02	1.19	1.36	1.53	1.70	1.87	2.04
150	0.29	0.44	0.59	0.73	0.88	1.03	1.18	1.32	1.47	1.62	1.76
180	0.26	0.39	0.52	0.65	0.78	0.91	1.04	1.18	1.31	1.44	1.57
240	0.22	0.33	0.43	0.54	0.65	0.76	0.87	0.98	1.08	1.19	1.30
300	0.19	0.28	0.38	0.47	0.56	0.66	0.75	0.85	0.94	1.03	1.13
360	0.17	0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.84	0.92	1.00

Intensity-Duration Design Chart - Template

FIGURE 3-1



Directions for Application:

(1) From precipitation maps determine 6 hr and 24 hr amounts for the selected frequency. These maps are included in the County Hydrology Manual (10, 50, and 100 yr maps included in the Design and Procedure Manual).

(2) Adjust 6 hr precipitation (if necessary) so that it is within the range of 45% to 65% of the 24 hr precipitation (not applicaple to Desert).

(3) Plot 6 hr precipitation on the right side of the chart.

(4) Draw a line through the point parallel to the plotted lines.

(5) This line is the intensity-duration curve for the location being analyzed.

Application Form:

(a) Selected frequency 25 year

(b) P_6 = 3.0 In., P_{24} = 6.5 $\frac{P_6}{P_{24}}$ = 46 %(2)

(c) Adjusted P_6(2) = 3.0 in.

(d) t_x = * min.

(e) I = * in./hr.

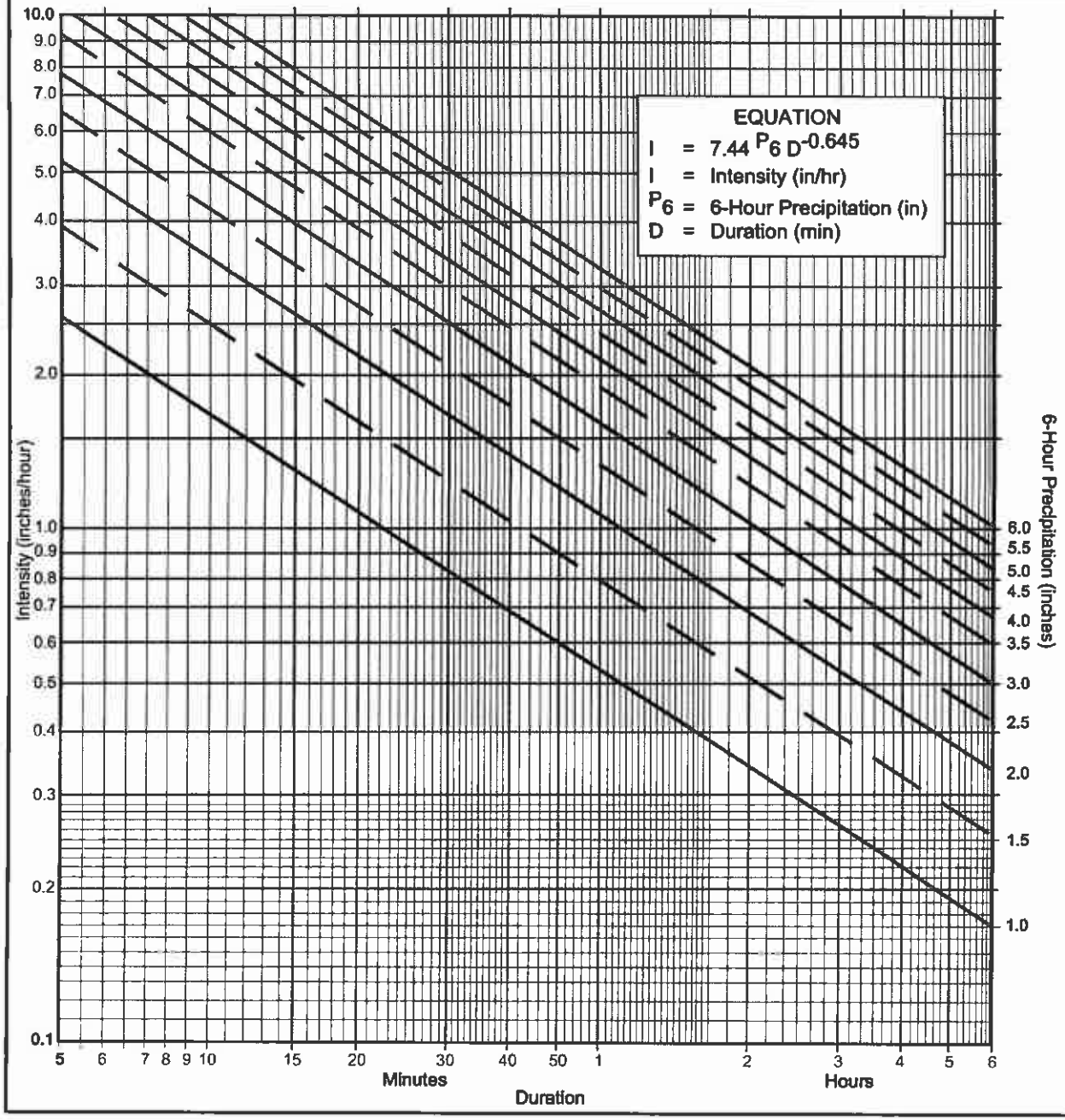
*Calculated with AES software, as described by the methods in Section III of this Drainage Study. Results are tabulated in Section VI.

Note: This chart replaces the Intensity-Duration-Frequency curves used since 1965.

P6	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
Duration	I	I	I	I	I	I	I	I	I	I	I
5	2.63	3.95	5.27	6.59	7.90	9.22	10.54	11.86	13.17	14.49	15.81
7	2.12	3.18	4.24	5.30	6.36	7.42	8.48	9.54	10.60	11.66	12.72
10	1.68	2.53	3.37	4.21	5.05	5.90	6.74	7.58	8.42	9.27	10.11
15	1.30	1.95	2.59	3.24	3.89	4.54	5.19	5.84	6.49	7.13	7.78
20	1.08	1.62	2.15	2.69	3.23	3.77	4.31	4.85	5.39	5.93	6.46
25	0.93	1.40	1.87	2.33	2.80	3.27	3.73	4.20	4.67	5.13	5.60
30	0.83	1.24	1.66	2.07	2.49	2.90	3.32	3.73	4.15	4.56	4.98
40	0.69	1.03	1.38	1.72	2.07	2.41	2.76	3.10	3.45	3.79	4.13
50	0.60	0.90	1.19	1.49	1.79	2.09	2.39	2.69	2.98	3.28	3.58
60	0.53	0.80	1.06	1.33	1.59	1.86	2.12	2.39	2.65	2.92	3.18
80	0.41	0.61	0.82	1.02	1.23	1.43	1.63	1.84	2.04	2.25	2.45
120	0.34	0.51	0.68	0.85	1.02	1.19	1.36	1.53	1.70	1.87	2.04
150	0.29	0.44	0.59	0.73	0.88	1.03	1.18	1.32	1.47	1.62	1.76
180	0.26	0.39	0.52	0.65	0.78	0.91	1.04	1.18	1.31	1.44	1.57
240	0.22	0.33	0.43	0.54	0.65	0.76	0.87	0.98	1.08	1.19	1.30
300	0.19	0.28	0.38	0.47	0.56	0.66	0.75	0.85	0.94	1.03	1.13
360	0.17	0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.84	0.92	1.00

Intensity-Duration Design Chart - Template

FIGURE 3-1



Directions for Application:

(1) From precipitation maps determine 6 hr and 24 hr amounts for the selected frequency. These maps are included in the County Hydrology Manual (10, 50, and 100 yr maps included in the Design and Procedure Manual).

(2) Adjust 6 hr precipitation (if necessary) so that it is within the range of 45% to 65% of the 24 hr precipitation (not applicaple to Desert).

(3) Plot 6 hr precipitation on the right side of the chart.

(4) Draw a line through the point parallel to the plotted lines.

(5) This line is the intensity-duration curve for the location being analyzed.

Application Form:

(a) Selected frequency 100 year

(b) P_6 = 4.0 In., P_{24} = 10.0 , $\frac{P_6}{P_{24}}$ = 40 %(2)

(c) Adjusted P_6(2) = 4.5 in.

(d) t_x = * min.

(e) I = * in./hr.

*Calculated with AES software, as described by the methods in Section III of this Drainage Study. Results are tabulated in Section VI.

Note: This chart replaces the Intensity-Duration-Frequency curves used since 1965.

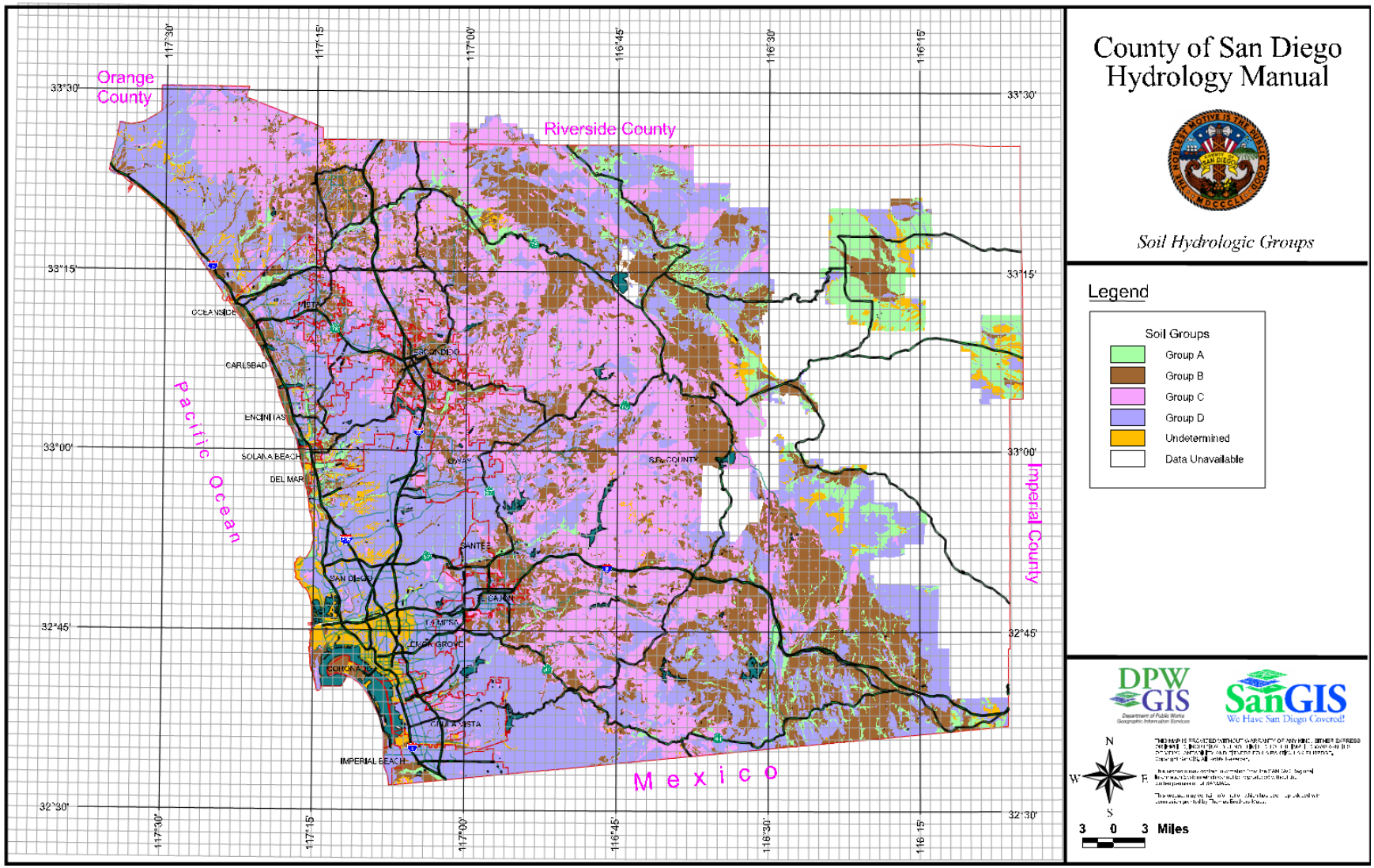
P6	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6
Duration	I	I	I	I	I	I	I	I	I	I	I
5	2.63	3.95	5.27	6.59	7.90	9.22	10.54	11.86	13.17	14.49	15.81
7	2.12	3.18	4.24	5.30	6.36	7.42	8.48	9.54	10.60	11.66	12.72
10	1.68	2.53	3.37	4.21	5.05	5.90	6.74	7.58	8.42	9.27	10.11
15	1.30	1.95	2.59	3.24	3.89	4.54	5.19	5.84	6.49	7.13	7.78
20	1.08	1.62	2.15	2.69	3.23	3.77	4.31	4.85	5.39	5.93	6.46
25	0.93	1.40	1.87	2.33	2.80	3.27	3.73	4.20	4.67	5.13	5.60
30	0.83	1.24	1.66	2.07	2.49	2.90	3.32	3.73	4.15	4.56	4.98
40	0.69	1.03	1.38	1.72	2.07	2.41	2.76	3.10	3.45	3.79	4.13
50	0.60	0.90	1.19	1.49	1.79	2.09	2.39	2.69	2.98	3.28	3.58
60	0.53	0.80	1.06	1.33	1.59	1.86	2.12	2.39	2.65	2.92	3.18
90	0.41	0.61	0.82	1.02	1.23	1.43	1.63	1.84	2.04	2.25	2.45
120	0.34	0.51	0.68	0.85	1.02	1.19	1.36	1.53	1.70	1.87	2.04
150	0.29	0.44	0.59	0.73	0.88	1.03	1.18	1.32	1.47	1.62	1.76
180	0.26	0.39	0.52	0.65	0.78	0.91	1.04	1.18	1.31	1.44	1.57
240	0.22	0.33	0.43	0.54	0.65	0.76	0.87	0.98	1.08	1.19	1.30
300	0.19	0.28	0.38	0.47	0.56	0.66	0.75	0.85	0.94	1.03	1.13
360	0.17	0.25	0.33	0.42	0.50	0.58	0.67	0.75	0.84	0.92	1.00

Intensity-Duration Design Chart - Template

FIGURE 3-1

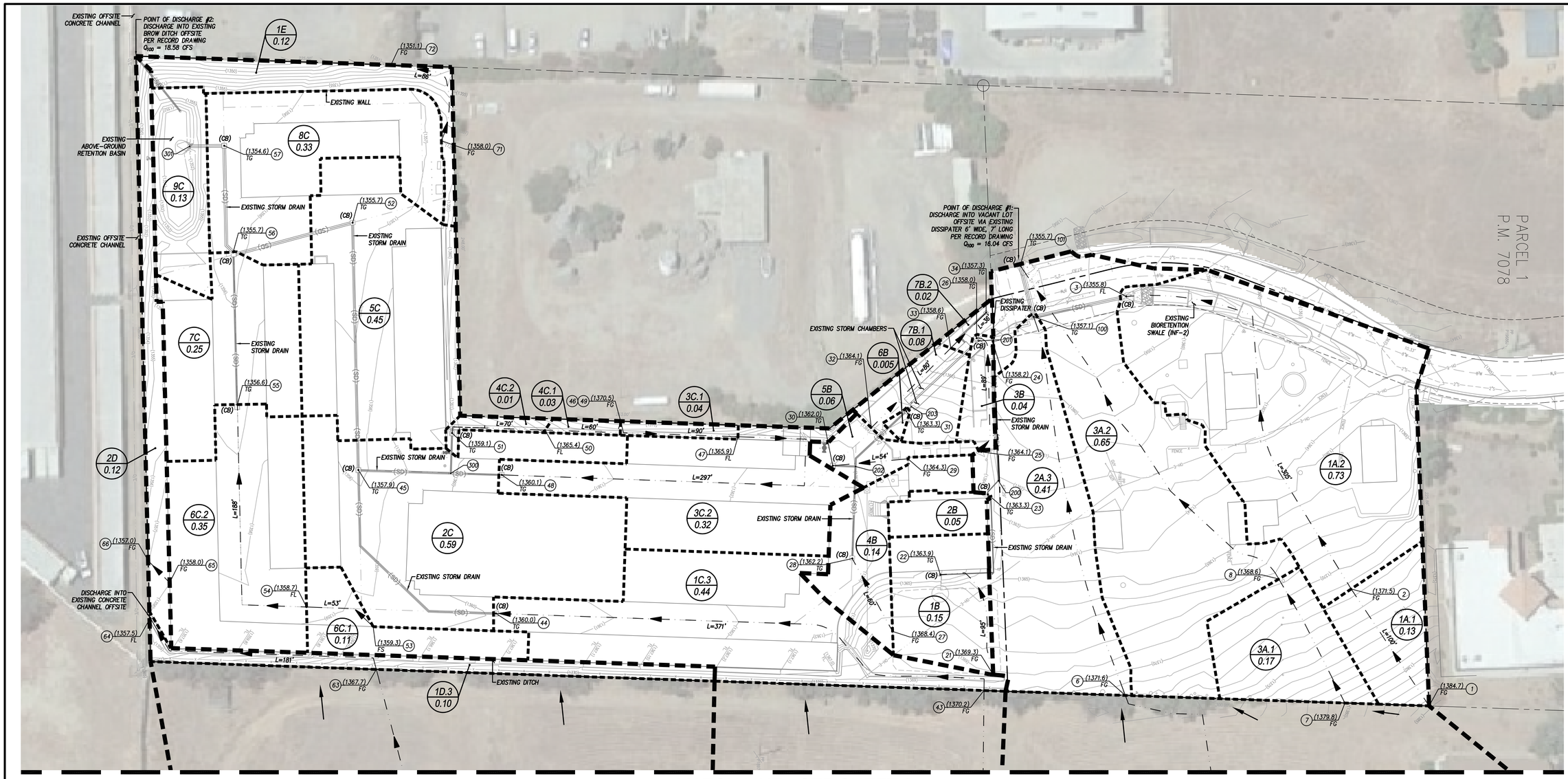
APPENDIX B

Hydrologic Soil Group Map


County of San Diego
Hydrology Manual
Soil Hydrologic Groups
Legend
Soil Groups
Group A
Group B
Group C
Group D
Undetermined
Data Unavailable
Orange County
Riverside County
Imperial County
Pacific Ocean
Mexico
OCEANSIDE
VISTA
CARLSBAD
ESCONDIDO
ENCINITAS
SOLANA BEACH
DEL MAR
SAN DIEGO
SANTEE
EL CAJON
LA MESA
LEMON GROVE
CORONADO
CHULA VISTA
IMPERIAL BEACH
SD COUNTY
DPW GIS
SanGIS
We Have San Diego Covered!
N
W
E
S
3 0 3 Miles

APPENDIX C

Hydrology Maps



MATCH LINE - SEE SHEET 2

DRAINAGE AREA SUMMARY

DMA	Tributary Area (acres)	Runoff Coefficient, C	Flowpath, D (ft)	Slope, s (%)	Existing Condition 10-Year Storm Runoff Q_{10} cfs	10-Year Storm T_{C10} min.	25-Year Storm Runoff Q_{25} cfs	25-Year Storm T_{C25} min.	100-Year Storm Runoff Q_{100} cfs	100-Year Storm T_{C100} min.
1A.1	0.13	0.30	100	13.2	0.23	6.7	0.26	6.7	0.38	6.7
1A.2	0.73	0.42	305	5.1	1.18	13.0	1.36	12.2	2.14	11.4
2A.1	0.40	0.30	100	5.0	0.61	8.4	0.68	8.4	1.02	8.4
2A.2	3.55	0.30	465	5.9	3.81	14.5	4.30	14.2	6.63	13.6
2A.3	0.41	0.36	278	5.2	0.49	16.5	0.55	16.0	0.86	15.2
3A.1	0.17	0.30	100	11.2	0.30	6.7	0.33	6.7	0.50	6.7
3A.2	0.65	0.42	294	4.4	1.15	11.3	1.24	11.8	1.98	10.7
"A" Subtotal	**6.03**	**0.33**	**--**	**--**	**6.60**	**16.6**	**7.48**	**16.1**	**11.63**	**15.3**
1B	0.15	0.45	95	5.7	0.41	6.4	0.46	6.4	0.68	6.4
2B	0.05	0.84	--	--	0.24	5.0	0.27	5.0	0.41	5.0
3B	0.04	0.84	89	6.9	0.24	5.0	0.27	5.0	0.40	5.0
4B	0.14	0.84	60	10.3	0.84	5.0	0.93	5.0	1.39	5.0
5B	0.06	0.84	54	4.3	0.36	5.0	0.40	5.0	0.60	5.0
6B	0.005	0.84	--	--	0.03	5.0	0.03	5.0	0.05	5.0
7B.1	0.08	0.84	80	3.1	0.48	5.0	0.53	5.0	0.80	5.0
7B.2	0.02	0.84	36	3.6	0.12	5.0	0.13	5.0	0.20	5.0
"B" Subtotal	**0.53**	**0.73**	**--**	**--**	**2.64**	**5.0**	**2.93**	**5.0**	**4.41**	**5.0**
1C.1	0.31	0.30	100	4.0	0.45	9.1	0.50	9.1	0.75	9.1
1C.2	1.80	0.42	380	7.1	2.70	14.5	3.03	14.3	4.75	13.4
1C.3	0.44	0.83	371	2.7	1.21	16.3	1.36	16.0	7.09	15.0
2C	0.59	0.84	--	--	1.62	5.0	1.82	5.0	2.85	5.0
3C.1	0.04	0.87	90	5.1	0.25	5.0	0.28	5.0	0.41	5.0
3C.2	0.32	0.84	297	2.0	1.91	5.0	2.12	5.0	3.19	5.0
4C.1	0.03	0.87	60	8.5	0.19	5.0	0.21	5.0	0.31	5.0
4C.2	0.01	0.87	70	9.0	0.06	5.0	0.07	5.0	0.10	5.0
5C	0.44	0.84	--	--	1.19	5.0	1.34	5.0	2.09	5.0
6C.1	0.11	0.84	53	1.1	0.66	5.0	0.73	5.0	1.10	5.0
6C.2	0.35	0.84	188	1.1	2.09	5.0	2.32	5.0	3.49	5.0
7C	0.25	0.84	--	--	1.44	5.3	1.63	5.2	2.49	5.0
8C	0.33	0.83	--	--	0.87	5.0	0.98	5.0	1.53	5.0
9C	0.13	0.34	--	--	0.14	5.0	0.16	5.0	0.25	5.0
"C" Subtotal	**5.16**	**0.65**	**--**	**--**	**10.56**	**17.5**	**11.85**	**17.2**	**18.58**	**16.1**
1D.1	0.57	0.30	100	23.0	1.01	6.7	1.12	6.7	1.68	6.7
1D.2	5.18	0.27	651	9.4	4.91	15.0	5.70	14.0	9.07	12.8
1D.3	0.10	0.48	181	5.6	0.17	15.2	0.19	14.2	0.31	13.0
2D	0.12	0.30	22	4.5	0.26	5.0	0.28	5.0	0.43	5.0
"D" Subtotal	**5.97**	**0.28**	**--**	**--**	**5.74**	**15.4**	**6.66**	**14.4**	**10.58**	**13.1**
1E	0.12	0.20	86	8.0	0.13	7.5	0.15	7.5	0.22	7.5
"E" Subtotal	**0.12**	**0.20**	**--**	**--**	**0.13**	**7.5**	**0.15**	**7.5**	**0.22**	**7.5**
Study Total	**17.81**	**0.42**	**--**	**--**	**25.67**	**--**	**29.07**	**--**	**45.42**	**--**

LEGEND:

- DRAINAGE STUDY AREA BOUNDARY
- DRAINAGE SUBAREA BOUNDARY
- LONGEST FLOW PATH
- DIRECTION OF FLOW
- 1A / 0.11 — SUBAREA DESIGNATION / AREA (ACRES)
- (CB) — EXISTING CATCH BASIN

30' 0' 30' 60' 90'

GRAPHIC SCALE: 1"=30'

NOT FOR CONSTRUCTION

DRC Engineering, Inc.
Civil Engineering/Land Surveying/Land Planning
160 S. Old Springs Road
Suite 210
Anaheim Hills, CA 92808
714-685-6860

NO.:	REVISION:	DATE:

PROJECT: GS VALLEY EXPANSION
28435 LIZARD ROCKS ROAD
VALLEY CENTER, CALIFORNIA

DRAWING NAME: EXISTING HYDROLOGY MAP

ISSUE:	HYDROLOGY
DATE:	5/27/2021
CHECKED: JH	DRAWN: JH
DRAWING FILE:	19132EXHM
PROJECT NO.:	19-132
SHEET NUMBER:	1
OF	2 SHEETS
SCALE:	AS SHOWN

FILENAME: M:\2019\19-132 Greens Global Valley Center SD\HM\19132 EXHM.dwg, LAST SAVED ON: May 27 2021 10:50am PLOTTED BY: JULIE, ON: May 27 2021 11:08am, CFG.

MATCH LINE - SEE SHEET 1

1C.2
1.80

2A.2
3.55

1D.2
5.18

42 (1397.0) FG

1C.1
0.31

(1399.0) FG 5

2A.1
0.40

(1401.0) FG 41

(1404.0) FG 4

62 (1429.0) FG

1D.1
0.57

61 (1452.0) FG

LEGEND:

- DRAINAGE STUDY AREA BOUNDARY
- DRAINAGE SUBAREA BOUNDARY
- LONGEST FLOW PATH
- DIRECTION OF FLOW
- 1A / 0.11 — SUBAREA DESIGNATION / AREA (ACRES)
- (CB) EXISTING CATCH BASIN

N

30' 0' 30' 60' 90'

GRAPHIC SCALE: 1"=30'

NOT FOR CONSTRUCTION

160 S. Old Springs Road
Suite 210
Anaheim Hills, CA 92808
714-685-6860

DRC Engineering, Inc.
Civil Engineering/Land Surveying/Land Planning

DATE:

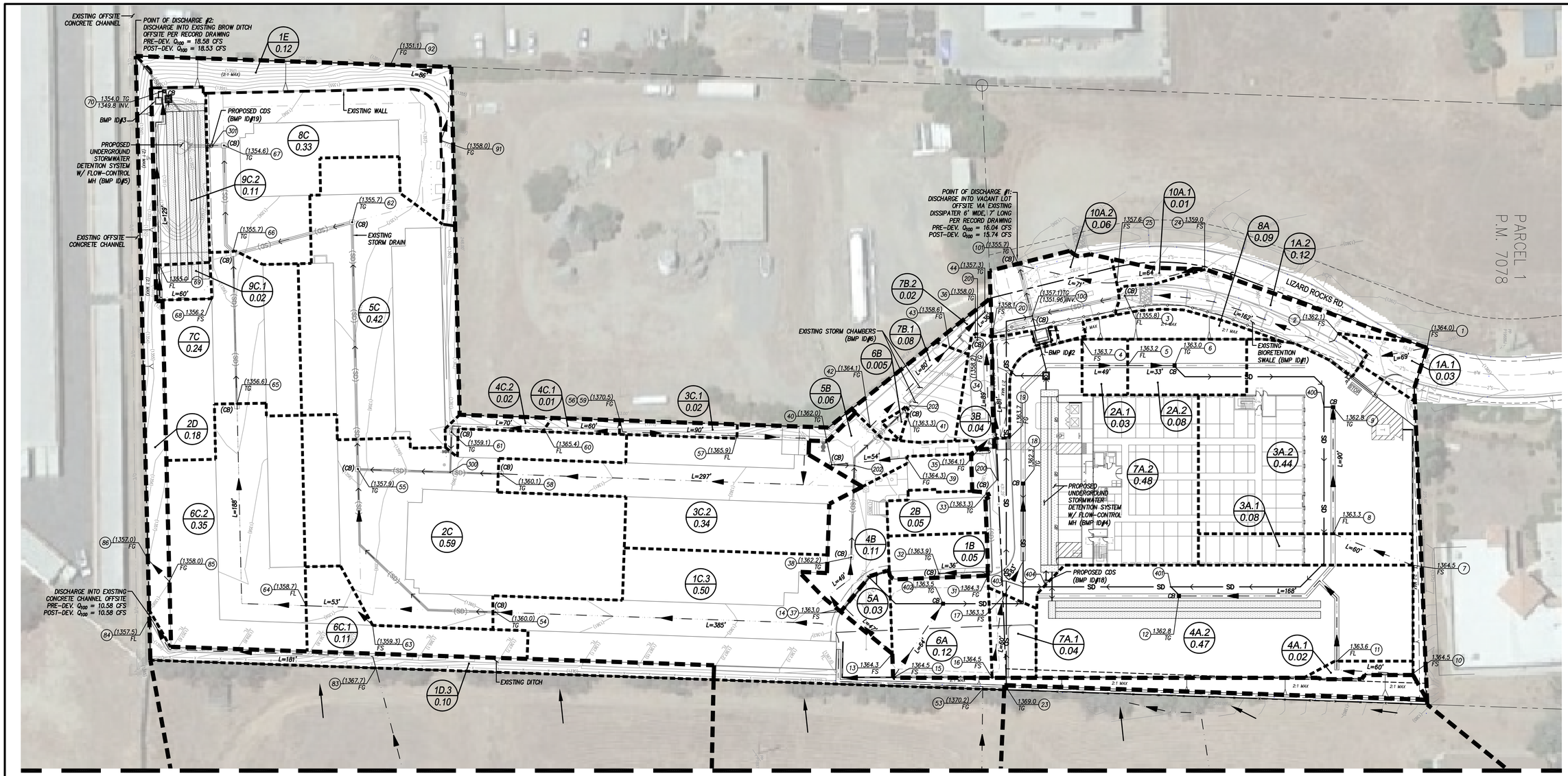
NO.: REVISION:

PROJECT:
GS VALLEY EXPANSION
28435 LIZARD ROCKS ROAD
VALLEY CENTER, CALIFORNIA

DRAWING NAME:
EXISTING HYDROLOGY MAP

ISSUE:	HYDROLOGY
DATE:	5/27/2021
CHECKED: JH	DRAWN: JH
DRAWING FILE:	19132EXHM
PROJECT NO.:	19-132
SHEET NUMBER:	2
OF	2 SHEETS
SCALE:	AS SHOWN

FILENAME: M:\2019\19-132 Greens Global Valley Center SD\HM\19132 EXHM.dwg, LAST SAVED ON: May 27 2021 10:50am PLOTTED BY: JULIE, ON: May 27 2021 11:08am, OTG



MATCH LINE - SEE SHEET 2

STRUCTURAL BMP IMPLEMENTED	
BMP ID#	BMP TYPE
1	INF-2: BIORETENTION (EXISTING)
2	BF-3: PROPRIETARY BIOFILTRATION (MODULAR WETLAND SYSTEM MWS-L-8-8-V)
3	BF-3: PROPRIETARY BIOFILTRATION (MODULAR WETLAND SYSTEM MWS-L-4-4-C)
4	HYDROMODIFICATION MANAGEMENT (DETENTION VAULT)
5	HYDROMODIFICATION MANAGEMENT (DETENTION VAULT)
6	HYDROMODIFICATION MANAGEMENT (DETENTION VAULT, EXISTING)

DRAINAGE AREA SUMMARY

DMA	Tributary Area (acres)	Runoff Coefficient, C	Flowpath, D (ft)	Slope, s (%)	Proposed Condition 10-Year Storm Runoff Q_{10} cfs	10-Year Storm T_{C10} min.	25-Year Storm Runoff Q_{25} cfs	25-Year Storm T_{C25} min.	100-Year Storm Runoff Q_{100} cfs	100-Year Storm T_{C100} min.
1A.1	0.03	0.69	69	2.8	0.15	5.0	0.16	5.0	0.25	5.0
1A.2	0.12	0.69	162	3.9	0.41	8.8	0.47	8.2	0.71	8.3
2A.1	0.03	0.84	49	1.0	0.18	5.0	0.20	5.0	0.30	5.0
2A.2	0.08	0.84	33	0.6	0.48	5.0	0.53	5.0	0.80	5.0
3A.1	0.08	0.84	60	2.0	0.48	5.0	0.53	5.0	0.80	5.0
3A.2	0.44	0.84	90	0.6	2.63	5.0	2.92	5.0	4.38	5.0
4A.1	0.02	0.84	60	1.5	0.12	5.0	0.13	5.0	0.20	5.0
4A.2	0.47	0.84	168	0.5	2.79	5.0	3.12	5.0	4.68	5.0
5A	0.03	0.84	47	2.8	0.18	5.0	0.20	5.0	0.30	5.0
6A	0.12	0.84	64	1.6	0.72	5.0	0.80	5.0	1.20	5.0
7A.1	0.04	0.84	60	2.0	0.24	5.0	0.27	5.0	0.40	5.0
7A.2	0.48	0.84	83	1.2	3.11	5.0	3.19	5.0	4.78	5.0
8A	0.08	0.69	81	6.9	0.39	5.0	0.44	5.0	0.65	5.0
9A.1	0.40	0.30	100	5.0	0.61	8.4	0.68	8.4	1.02	8.4
9A.2	3.57	0.30	550	5.5	3.62	15.9	4.10	15.4	6.34	14.7
10A.1	0.03	0.69	64	2.2	0.15	5.0	0.16	5.0	0.25	5.0
10A.2	0.09	0.69	71	2.7	0.40	5.8	0.45	5.7	0.68	5.6
"A" Subtotal	**6.10**	**0.48**	--	--	**15.35**	**5.0**	**17.18**	**5.0**	**26.27**	**5.0**
1B	0.05	0.84	36	1.1	0.30	5.0	0.33	5.0	0.50	5.0
2B	0.05	0.84	--	--	0.30	5.0	0.33	5.0	0.50	5.0
3B	0.04	0.84	89	6.9	0.24	5.0	0.27	5.0	0.40	5.0
4B	0.11	0.84	49	1.6	0.66	5.0	0.73	5.0	1.10	5.0
5B	0.06	0.84	54	4.3	0.36	5.0	0.40	5.0	0.60	5.0
6B	0.005	0.84	--	--	0.03	5.0	0.03	5.0	0.05	5.0
7B.1	0.08	0.84	80	3.1	0.48	5.0	0.53	5.0	0.80	5.0
7B.2	0.02	0.84	36	3.6	0.12	5.0	0.13	5.0	0.20	5.0
"B" Subtotal	**0.40**	**0.84**	--	--	**2.49**	**5.0**	**2.75**	**5.0**	**4.13**	**5.0**
1C.1	0.31	0.30	100	4.0	0.45	9.1	0.50	9.1	0.75	9.1
1C.2	1.80	0.42	380	7.1	2.70	14.5	3.03	14.3	4.75	13.4
1C.3	0.50	0.83	385	2.6	1.37	16.4	1.54	16.1	2.42	15.1
2C	0.59	0.84	--	--	1.61	5.0	1.81	5.0	2.84	5.0
3C.1	0.04	0.87	90	5.1	0.25	5.0	0.28	5.0	0.41	5.0
3C.2	0.32	0.84	297	2.0	1.91	5.0	2.12	5.0	3.19	5.0
4C.1	0.03	0.87	60	8.5	0.19	5.0	0.21	5.0	0.31	5.0
4C.2	0.01	0.87	70	9.0	0.06	5.0	0.07	5.0	0.10	5.0
5C	0.44	0.84	--	--	1.19	5.0	1.33	5.0	2.09	5.0
6C.1	0.11	0.84	53	1.1	0.66	5.0	0.73	5.0	1.10	5.0
6C.2	0.35	0.84	188	1.1	2.09	5.0	2.32	5.0	3.49	5.0
7C	0.24	0.84	--	--	1.43	5.0	1.59	5.0	2.39	5.0
8C	0.33	0.83	--	--	0.87	5.0	0.97	5.0	1.53	5.0
9C.1	0.02	0.83	60	2.0	0.12	5.0	0.13	5.0	0.20	5.0
9C.2	0.11	0.83	129	0.8	0.65	5.0	0.72	5.0	1.08	5.0
"C" Subtotal	**5.21**	**0.41**	--	--	**11.30**	**5.0**	**12.68**	**5.0**	**19.82**	**5.0**
1D.1	0.57	0.30	100	23.0	1.01	6.7	1.12	6.7	1.68	6.7
1D.2	5.18	0.27	651	9.4	4.91	15.0	5.70	14.0	9.07	12.8
1D.3	0.10	0.48	181	5.6	0.17	15.2	0.19	14.2	0.31	13.0
2D	0.12	0.30	22	4.5	0.26	5.0	0.28	5.0	0.43	5.0
"D" Subtotal	**5.97**	**0.28**	--	--	**5.74**	**15.4**	**6.66**	**14.4**	**10.58**	**13.1**
1E	0.12	0.20	86	8.0	0.13	7.5	0.15	7.5	0.22	7.5
"E" Subtotal	**0.12**	**0.20**	--	--	**0.13**	**7.5**	**0.15**	**7.5**	**0.22**	**7.5**
Study Total	**17.81**	**0.38**	--	--	**35.01**	--	**39.42**	--	**61.02**	--

LEGEND:

- DRAINAGE STUDY AREA BOUNDARY
- DRAINAGE SUBAREA BOUNDARY
- LONGEST FLOW PATH
- DIRECTION OF FLOW
- 1A / 0.11 — SUBAREA DESIGNATION / AREA (ACRES)
- (CB) — EXISTING CATCH BASIN
- CB — PROPOSED CATCH BASIN
- SD — DIRECTION OF PIPE FLOW

GRAPHIC SCALE: 1"=30'

NOT FOR CONSTRUCTION

DRC Engineering, Inc.
Civil Engineering/Land Surveying/Land Planning
160 S. Old Springs Road
Suite 210
Anaheim Hills, CA 92808
714-685-6860

NO.:	REVISION:	DATE:

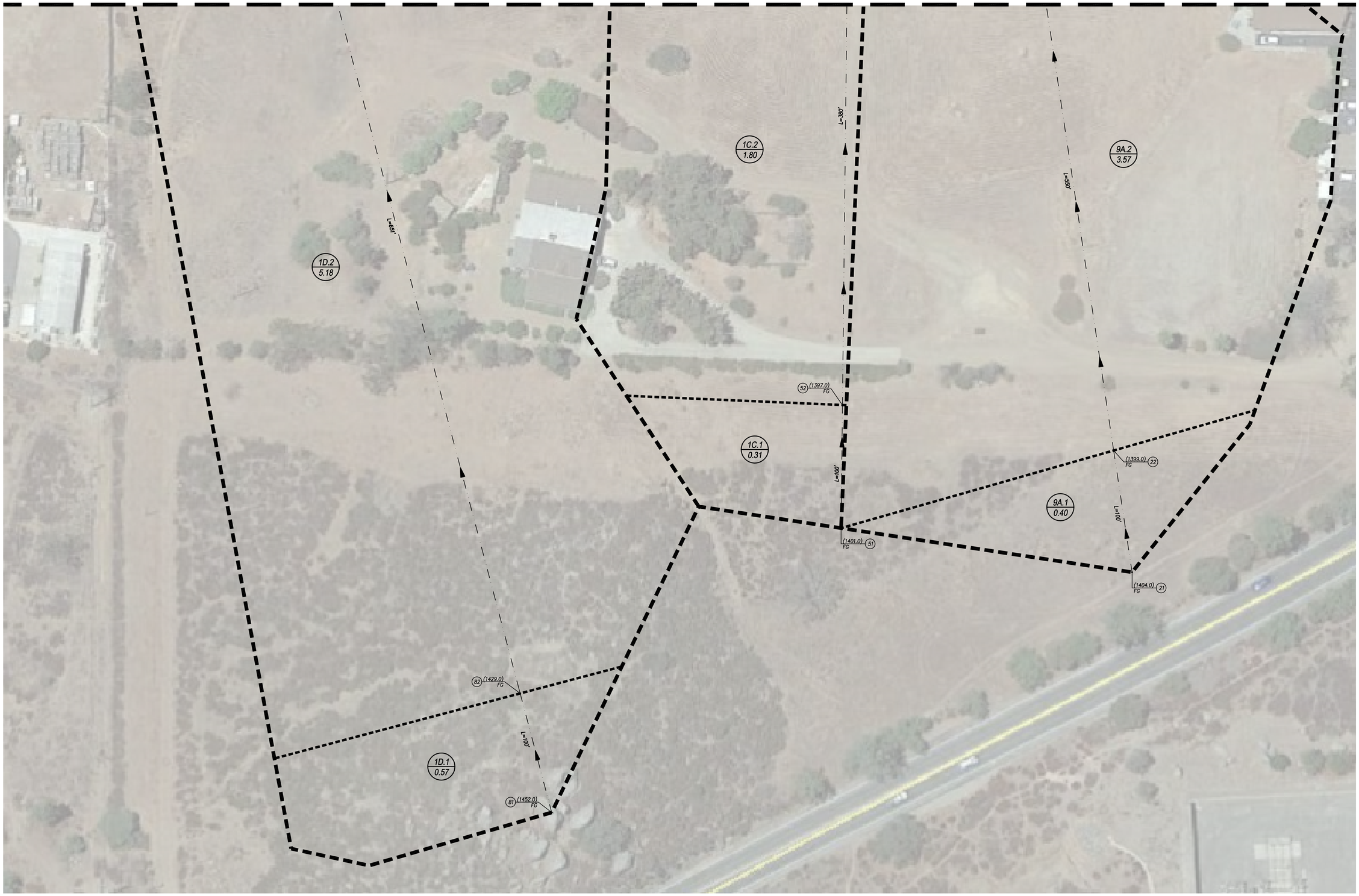
PROJECT: GS VALLEY EXPANSION
28435 LIZARD ROCKS ROAD
VALLEY CENTER, CALIFORNIA

DRAWING NAME: PROPOSED HYDROLOGY MAP

ISSUE:	HYDROLOGY
DATE:	5/4/2021
CHECKED: JH	DRAWN: JH
DRAWING FILE:	19132PRHM
PROJECT NO.:	19-132
SHEET NUMBER:	1
OF	2 SHEETS
SCALE:	AS SHOWN

FILENAME: M:\2019\19-132 Greens Global Valley Center SD\HM\19132 PRHM.dwg, LAST SAVED ON: May 27 2021 11:55am PLOTTED BY: JULIE, ON: May 27 2021 12:19pm, CFG:

MATCH LINE - SEE SHEET 1



LEGEND:

- DRAINAGE STUDY AREA BOUNDARY
- DRAINAGE SUBAREA BOUNDARY
- LONGEST FLOW PATH
- DIRECTION OF FLOW
- 1A / 0.11 — SUBAREA DESIGNATION / AREA (ACRES)
- (CB) — EXISTING CATCH BASIN
- CB — PROPOSED CATCH BASIN
- SD — DIRECTION OF PIPE FLOW

N

30' 0' 30' 60' 90'

GRAPHIC SCALE: 1"=30'

NOT FOR CONSTRUCTION

160 S. Old Springs Road
Suite 210
Anaheim Hills, CA 92808
714-685-6860

DRC Engineering, Inc.
Civil Engineering/Land Surveying/Land Planning

NO.:	REVISION:	DATE:

PROJECT:

GS VALLEY EXPANSION
28435 LIZARD ROCKS ROAD
VALLEY CENTER, CALIFORNIA

DRAWING NAME:

PROPOSED HYDROLOGY MAP

ISSUE:	HYDROLOGY
DATE:	5/4/2021
CHECKED: JH	DRAWN: JH
DRAWING FILE: 19132PRHM	
PROJECT NO.: 19-132	
SHEET NUMBER:	2
OF	2 SHEETS
SCALE: AS SHOWN	

FILENAME: M:\2019\19-132 Greens Global Valley Center SD\HM\19132 PRHM.dwg, LAST SAVED ON: May 27 2021 11:55am PLOTTED BY: JULIE, ON: May 27 2021 12:16pm, CFG:

APPENDIX D

Hydrology Calculations

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

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2015 Advanced Engineering Software (aes)
              Ver. 22.0 Release Date: 07/01/2015  License ID 1510

                            Analysis prepared by:

                            DRC Engineering, Inc.
                      160 South Old Springs Road, Suite 210
                             Anaheim Hills, CA 92808
                                  714-685-6860

 ************************* DESCRIPTION OF STUDY *************************
* 19-132 GS VALLEY EXPANSION (28435 LIZARD ROCKS ROAD)                    *
* EXISTING CONDITION                                                      *
* 10-YEAR STORM EVENT                                                     *
 ************************************************************************

  FILE NAME: 19132E10.DAT
  TIME/DATE OF STUDY: 11:08 05/19/2021
------------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) =  10.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.700
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)   (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   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.*

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1A.1                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

******************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1384.70
  DOWNSTREAM ELEVATION(FEET) =   1371.50
  ELEVATION DIFFERENCE(FEET) =     13.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.684
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.899
  SUBAREA RUNOFF(CFS) =      0.23
```

```
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.23

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1A.2                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   305.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0510
  CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.841
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  79
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.80
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   6.32
  Tc(MIN.) =   13.00
  SUBAREA AREA(ACRES) =     0.73       SUBAREA RUNOFF(CFS) =    1.18
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.402
  TOTAL AREA(ACRES) =        0.9         PEAK FLOW RATE(CFS) =       1.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.03   FLOW VELOCITY(FEET/SEC.) =   1.20
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     405.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE    100.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0120
  FLOW LENGTH(FEET) =    62.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS   3.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.04
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.33
  PIPE TRAVEL TIME(MIN.) =   0.26    Tc(MIN.) =   13.26
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE    100.00 =     467.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.26
  RAINFALL INTENSITY(INCH/HR) =   3.79
  TOTAL STREAM AREA(ACRES) =     0.86
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.33

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2A.1                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE      4.00 TO NODE      5.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
================================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1404.00
  DOWNSTREAM ELEVATION(FEET) =   1399.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.422
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.082
  SUBAREA RUNOFF(CFS) =      0.61
  TOTAL AREA(ACRES) =      0.40   TOTAL RUNOFF(CFS) =      0.61

+------------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2A.2                                                        |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+

********************************************************************************
  FLOW PROCESS FROM NODE      5.00 TO NODE      6.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   465.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0590
  CHANNEL BASE(FEET) =   60.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.576
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.27
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   6.10
  Tc(MIN.) =   14.52
  SUBAREA AREA(ACRES) =     3.55       SUBAREA RUNOFF(CFS) =    3.81
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =        4.0         PEAK FLOW RATE(CFS) =       4.24

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.05   FLOW VELOCITY(FEET/SEC.) =   1.45
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE      6.00 =     565.00 FEET.

+------------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2A.3                                                        |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+

********************************************************************************
  FLOW PROCESS FROM NODE      6.00 TO NODE    100.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   278.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0520
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.292
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.48
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.33
  AVERAGE FLOW DEPTH(FEET) =   0.10   TRAVEL TIME(MIN.) =   1.99
  Tc(MIN.) =   16.51
  SUBAREA AREA(ACRES) =     0.41       SUBAREA RUNOFF(CFS) =    0.49
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.306
```

```
  TOTAL AREA(ACRES) =        4.4         PEAK FLOW RATE(CFS) =       4.39

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.09   FLOW VELOCITY(FEET/SEC.) =   2.32
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE    100.00 =     843.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 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.) =   16.51
  RAINFALL INTENSITY(INCH/HR) =   3.29
  TOTAL STREAM AREA(ACRES) =     4.36
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.39

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        1.33    13.26        3.793          0.86
      2        4.39    16.51        3.292          4.36

  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        4.85    13.26       3.793
      2        5.54    16.51       3.292

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       5.54   Tc(MIN.) =   16.51
  TOTAL AREA(ACRES) =        5.2
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE    100.00 =     843.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    35.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS   8.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.73
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.54
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =   16.62
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE    101.00 =     878.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    101.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.62
  RAINFALL INTENSITY(INCH/HR) =   3.28
  TOTAL STREAM AREA(ACRES) =     5.22
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.54

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 3A.1                                                    |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+
```

```
****************************************************************************
  FLOW PROCESS FROM NODE      7.00 TO NODE      8.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1379.80
  DOWNSTREAM ELEVATION(FEET) =   1368.60
  ELEVATION DIFFERENCE(FEET) =     11.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.684
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.899
  SUBAREA RUNOFF(CFS) =      0.30
  TOTAL AREA(ACRES) =      0.17   TOTAL RUNOFF(CFS) =      0.30

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 3A.2                                                    |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE      8.00 TO NODE    101.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   294.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0440
  CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.196
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  79
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.87
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.05
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   4.65
  Tc(MIN.) =   11.34
  SUBAREA AREA(ACRES) =     0.65       SUBAREA RUNOFF(CFS) =    1.15
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.395
  TOTAL AREA(ACRES) =        0.8         PEAK FLOW RATE(CFS) =       1.36

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.04   FLOW VELOCITY(FEET/SEC.) =   1.10
  LONGEST FLOWPATH FROM NODE      7.00 TO NODE    101.00 =     394.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    101.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.34
  RAINFALL INTENSITY(INCH/HR) =   4.20
  TOTAL STREAM AREA(ACRES) =     0.82
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.36

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        5.54    16.62        3.279          5.22
      2        1.36    11.34        4.196          0.82

  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        5.69    11.34       4.196
      2        6.60    16.62       3.279

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       6.60   Tc(MIN.) =   16.62
  TOTAL AREA(ACRES) =        6.0
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE    101.00 =     878.00 FEET.

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1B                                                        |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     21.00 TO NODE     22.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (2.9 DU/AC OR LESS) RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  80
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =   1369.30
  DOWNSTREAM ELEVATION(FEET) =   1363.90
  ELEVATION DIFFERENCE(FEET) =      5.40
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.390
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.073
  SUBAREA RUNOFF(CFS) =      0.41
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.41

****************************************************************************
  FLOW PROCESS FROM NODE     22.00 TO NODE     23.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    94.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   6.0 INCH PIPE IS   3.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.18
  GIVEN PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.41
  PIPE TRAVEL TIME(MIN.) =   0.49    Tc(MIN.) =    6.88
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     23.00 =     189.00 FEET.

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2B                                                        |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     23.00 TO NODE     23.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.789
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5475
  SUBAREA AREA(ACRES) =    0.05   SUBAREA RUNOFF(CFS) =    0.24
  TOTAL AREA(ACRES) =        0.2   TOTAL RUNOFF(CFS) =       0.63
  TC(MIN.) =    6.88
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     23.00 TO NODE    200.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0640
  FLOW LENGTH(FEET) =    13.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   6.0 INCH PIPE IS   2.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.15
  GIVEN PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.63
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =    6.91
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE    200.00 =     202.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE     24.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0180
  FLOW LENGTH(FEET) =    99.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   6.0 INCH PIPE IS   4.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.38
  GIVEN PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.63
  PIPE TRAVEL TIME(MIN.) =   0.38    Tc(MIN.) =    7.29
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     24.00 =     301.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     24.00 TO NODE     26.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =    12.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0170
  CHANNEL BASE(FEET) =    6.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.63
  FLOW VELOCITY(FEET/SEC.) =   1.88   FLOW DEPTH(FEET) =   0.06
  TRAVEL TIME(MIN.) =   0.11   Tc(MIN.) =    7.40
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     26.00 =     313.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     26.00 TO NODE     26.00 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.) =    7.40
  RAINFALL INTENSITY(INCH/HR) =   5.53
  TOTAL STREAM AREA(ACRES) =     0.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.63

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 3B                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE     26.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    89.00
  UPSTREAM ELEVATION(FEET) =   1364.10
  DOWNSTREAM ELEVATION(FEET) =   1358.00
  ELEVATION DIFFERENCE(FEET) =      6.10
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.324
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.24
  TOTAL AREA(ACRES) =      0.04   TOTAL RUNOFF(CFS) =      0.24

****************************************************************************
  FLOW PROCESS FROM NODE     26.00 TO NODE     26.00 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.) =    2.32
  RAINFALL INTENSITY(INCH/HR) =   7.11
  TOTAL STREAM AREA(ACRES) =     0.04
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.24

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        0.63     7.40        5.526          0.20
      2        0.24     2.32        7.114          0.04

  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        0.44     2.32       7.114
      2        0.82     7.40       5.526

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       0.82   Tc(MIN.) =    7.40
  TOTAL AREA(ACRES) =        0.2
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     26.00 =     313.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     26.00 TO NODE    201.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =     1.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   3.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.79
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.82
  PIPE TRAVEL TIME(MIN.) =   0.00    Tc(MIN.) =    7.40
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE    201.00 =     314.00 FEET.

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 4B                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     27.00 TO NODE     28.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
```

```
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    60.00
  UPSTREAM ELEVATION(FEET) =   1368.40
  DOWNSTREAM ELEVATION(FEET) =   1362.20
  ELEVATION DIFFERENCE(FEET) =      6.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.683
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.84
  TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.84

****************************************************************************
  FLOW PROCESS FROM NODE     28.00 TO NODE    202.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    64.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   3.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.79
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.84
  PIPE TRAVEL TIME(MIN.) =   0.28    Tc(MIN.) =    1.96
  LONGEST FLOWPATH FROM NODE     27.00 TO NODE    202.00 =     124.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    202.00 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.) =    1.96
  RAINFALL INTENSITY(INCH/HR) =   7.11
  TOTAL STREAM AREA(ACRES) =     0.14
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.84

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 5B                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     29.00 TO NODE     30.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    54.00
  UPSTREAM ELEVATION(FEET) =   1364.30
  DOWNSTREAM ELEVATION(FEET) =   1362.00
  ELEVATION DIFFERENCE(FEET) =      2.30
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.122
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.36
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE    202.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0380
  FLOW LENGTH(FEET) =    15.00   MANNING'S N =  0.012
```

```
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   1.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.70
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.36
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    2.17
  LONGEST FLOWPATH FROM NODE     29.00 TO NODE    202.00 =      69.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    202.00 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.) =    2.17
  RAINFALL INTENSITY(INCH/HR) =   7.11
  TOTAL STREAM AREA(ACRES) =     0.06
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.36

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        0.84     1.96        7.114          0.14
      2        0.36     2.17        7.114          0.06

  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        1.16     1.96       7.114
      2        1.20     2.17       7.114

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       1.20   Tc(MIN.) =    2.17
  TOTAL AREA(ACRES) =        0.2
  LONGEST FLOWPATH FROM NODE     27.00 TO NODE    202.00 =     124.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    203.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.1100
  FLOW LENGTH(FEET) =    54.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   2.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.82
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.20
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =    2.27
  LONGEST FLOWPATH FROM NODE     27.00 TO NODE    203.00 =     178.00 FEET.

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 6B                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    203.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
```

```
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8400
  SUBAREA AREA(ACRES) =    0.00   SUBAREA RUNOFF(CFS) =    0.03
  TOTAL AREA(ACRES) =        0.2   TOTAL RUNOFF(CFS) =       1.22
  TC(MIN.) =    2.27

+---------------------------------------------------------------------------+
| DRAINAGE SUBAREA 7B.1                                                     |
|                                                                           |
|                                                                           |
+---------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     32.00 TO NODE     33.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1361.10
  DOWNSTREAM ELEVATION(FEET) =   1358.60
  ELEVATION DIFFERENCE(FEET) =      2.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.863
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.48
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.48

+---------------------------------------------------------------------------+
| DRAINAGE SUBAREA 7B.2                                                     |
|                                                                           |
|                                                                           |
+---------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     34.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =    36.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0360
  CHANNEL BASE(FEET) =    8.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.01
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   0.30
  Tc(MIN.) =    3.16
  SUBAREA AREA(ACRES) =     0.02       SUBAREA RUNOFF(CFS) =    0.12
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.840
  TOTAL AREA(ACRES) =        0.1         PEAK FLOW RATE(CFS) =       0.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.04   FLOW VELOCITY(FEET/SEC.) =   2.12
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     34.00 =     116.00 FEET.

+---------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1C.1                                                     |
|                                                                           |
|                                                                           |
+---------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     41.00 TO NODE     42.00 IS CODE =  21
----------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1401.00
  DOWNSTREAM ELEVATION(FEET) =   1397.00
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.072
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.844
  SUBAREA RUNOFF(CFS) =      0.45
  TOTAL AREA(ACRES) =      0.31   TOTAL RUNOFF(CFS) =      0.45

+------------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1C.2                                                        |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+

********************************************************************************
  FLOW PROCESS FROM NODE     42.00 TO NODE     43.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   380.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0710
  CHANNEL BASE(FEET) =   60.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.576
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  79
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.16
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   5.45
  Tc(MIN.) =   14.52
  SUBAREA AREA(ACRES) =     1.80       SUBAREA RUNOFF(CFS) =    2.70
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.402
  TOTAL AREA(ACRES) =        2.1         PEAK FLOW RATE(CFS) =       3.04

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.04   FLOW VELOCITY(FEET/SEC.) =   1.43
  LONGEST FLOWPATH FROM NODE     41.00 TO NODE     43.00 =     480.00 FEET.

+------------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1C.3                                                        |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+

********************************************************************************
  FLOW PROCESS FROM NODE     43.00 TO NODE     44.00 IS CODE =  91
--------------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
================================================================================
  REPRESENTATIVE SLOPE =  0.0270
  CHANNEL LENGTH THRU SUBAREA(FEET) =   371.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.090
  PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   0.50
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.325
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8300
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  92
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      3.64
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.57
  AVERAGE FLOW DEPTH(FEET) =   0.18   FLOOD WIDTH(FEET) =   13.20
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.73   Tc(MIN.) =   16.26
```

```
  SUBAREA AREA(ACRES) =    0.44       SUBAREA RUNOFF(CFS) =    1.21
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.476
  TOTAL AREA(ACRES) =        2.5         PEAK FLOW RATE(CFS) =       4.04

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.19   FLOOD WIDTH(FEET) =   13.98
  FLOW VELOCITY(FEET/SEC.) =   3.58   DEPTH*VELOCITY(FT*FT/SEC) =   0.68
  LONGEST FLOWPATH FROM NODE     41.00 TO NODE     44.00 =     851.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     44.00 TO NODE     45.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0130
  FLOW LENGTH(FEET) =   166.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   7.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.27
  GIVEN PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.04
  PIPE TRAVEL TIME(MIN.) =   0.44    Tc(MIN.) =   16.70
  LONGEST FLOWPATH FROM NODE     41.00 TO NODE     45.00 =    1017.00 FEET.

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2C                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     45.00 TO NODE     45.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.268
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5445
  SUBAREA AREA(ACRES) =    0.59   SUBAREA RUNOFF(CFS) =    1.62
  TOTAL AREA(ACRES) =        3.1   TOTAL RUNOFF(CFS) =       5.59
  TC(MIN.) =   16.70

****************************************************************************
  FLOW PROCESS FROM NODE     45.00 TO NODE     45.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 3C.1                                                    |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     46.00 TO NODE     47.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  ARTIICIAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .8700
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
  UPSTREAM ELEVATION(FEET) =   1370.50
  DOWNSTREAM ELEVATION(FEET) =   1365.90
  ELEVATION DIFFERENCE(FEET) =      4.60
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.280
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
```

```
  SUBAREA RUNOFF(CFS) =      0.25
  TOTAL AREA(ACRES) =      0.04   TOTAL RUNOFF(CFS) =      0.25

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 3C.2                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     47.00 TO NODE     48.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  CHANNEL LENGTH THRU SUBAREA(FEET) =   297.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.090
  PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   0.50
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      1.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.54
  AVERAGE FLOW DEPTH(FEET) =   0.13   FLOOD WIDTH(FEET) =    8.05
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.95   Tc(MIN.) =    4.23
  SUBAREA AREA(ACRES) =    0.32       SUBAREA RUNOFF(CFS) =    1.91
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.843
  TOTAL AREA(ACRES) =        0.4         PEAK FLOW RATE(CFS) =       2.16

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.16   FLOOD WIDTH(FEET) =   11.02
  FLOW VELOCITY(FEET/SEC.) =   2.85   DEPTH*VELOCITY(FT*FT/SEC) =   0.46
  LONGEST FLOWPATH FROM NODE     46.00 TO NODE     48.00 =     387.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     48.00 TO NODE    300.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0110
  FLOW LENGTH(FEET) =    34.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.04
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.16
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =    4.34
  LONGEST FLOWPATH FROM NODE     46.00 TO NODE    300.00 =     421.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    300.00 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.) =    4.34
  RAINFALL INTENSITY(INCH/HR) =   7.11
  TOTAL STREAM AREA(ACRES) =     0.36
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.16

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 4C.1                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+
```

```
****************************************************************************
 FLOW PROCESS FROM NODE     49.00 TO NODE     50.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 ARTIICIAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .8700
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  96
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    60.00
 UPSTREAM ELEVATION(FEET) =   1370.50
 DOWNSTREAM ELEVATION(FEET) =   1365.40
 ELEVATION DIFFERENCE(FEET) =      5.10
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.571
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.19
 TOTAL AREA(ACRES) =      0.03   TOTAL RUNOFF(CFS) =      0.19

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 4C.2                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
 FLOW PROCESS FROM NODE     50.00 TO NODE     51.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =    70.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0900
 CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   0.330
 MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 ARTIICIAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .8700
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  96
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.22
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.60
 AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   0.45
 Tc(MIN.) =    2.02
 SUBAREA AREA(ACRES) =     0.01       SUBAREA RUNOFF(CFS) =    0.06
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.870
 TOTAL AREA(ACRES) =        0.0         PEAK FLOW RATE(CFS) =       0.25

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.03   FLOW VELOCITY(FEET/SEC.) =   2.97
 LONGEST FLOWPATH FROM NODE     49.00 TO NODE     51.00 =     130.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     51.00 TO NODE    300.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0100
 FLOW LENGTH(FEET) =    27.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   2.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   2.65
 GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.25
 PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =    2.19
 LONGEST FLOWPATH FROM NODE     49.00 TO NODE    300.00 =     157.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    300.00 TO NODE    300.00 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.) =    2.19
  RAINFALL INTENSITY(INCH/HR) =   7.11
  TOTAL STREAM AREA(ACRES) =     0.04
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.25

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        2.16     4.34        7.114          0.36
      2        0.25     2.19        7.114          0.04

  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        1.34     2.19       7.114
      2        2.41     4.34       7.114

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       2.41   Tc(MIN.) =    4.34
  TOTAL AREA(ACRES) =        0.4
  LONGEST FLOWPATH FROM NODE     46.00 TO NODE    300.00 =     421.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE     45.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0220
  FLOW LENGTH(FEET) =    64.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   5.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.63
  GIVEN PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.41
  PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =    4.50
  LONGEST FLOWPATH FROM NODE     46.00 TO NODE     45.00 =     485.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     45.00 TO NODE     45.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        2.41     4.50       7.114        0.40
  LONGEST FLOWPATH FROM NODE     46.00 TO NODE     45.00 =     485.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        5.59    16.70       3.268        3.14
  LONGEST FLOWPATH FROM NODE     41.00 TO NODE     45.00 =    1017.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1       3.91       4.50       7.114
      2       6.69      16.70       3.268

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       6.69   Tc(MIN.) =   16.70
  TOTAL AREA(ACRES) =        3.5
```

```
****************************************************************************
 FLOW PROCESS FROM NODE     45.00 TO NODE     45.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE     45.00 TO NODE     52.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0150
 FLOW LENGTH(FEET) =   173.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.50
 GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       6.69
 PIPE TRAVEL TIME(MIN.) =   0.38    Tc(MIN.) =   17.08
 LONGEST FLOWPATH FROM NODE     41.00 TO NODE     52.00 =    1190.00 FEET.

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 5C                                                        |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
 FLOW PROCESS FROM NODE     52.00 TO NODE     52.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.221
 LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  96
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.6075
 SUBAREA AREA(ACRES) =    0.44   SUBAREA RUNOFF(CFS) =    1.19
 TOTAL AREA(ACRES) =        4.0   TOTAL RUNOFF(CFS) =       7.79
 TC(MIN.) =   17.08

****************************************************************************
 FLOW PROCESS FROM NODE     52.00 TO NODE     56.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0100
 FLOW LENGTH(FEET) =    84.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  24.0 INCH PIPE IS   9.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.67
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       7.79
 PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =   17.29
 LONGEST FLOWPATH FROM NODE     41.00 TO NODE     56.00 =    1274.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     56.00 TO NODE     56.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   17.29
 RAINFALL INTENSITY(INCH/HR) =   3.20
 TOTAL STREAM AREA(ACRES) =     3.98
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.79

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 6C.1                                                      |
|                                                                            |
```

```
|                                                                              |
+------------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     53.00 TO NODE     54.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    53.00
  UPSTREAM ELEVATION(FEET) =   1359.30
  DOWNSTREAM ELEVATION(FEET) =   1358.70
  ELEVATION DIFFERENCE(FEET) =      0.60
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.269
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.66
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.66

+------------------------------------------------------------------------------+
| DRAINAGE SUBAREA 6C.2                                                        |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     54.00 TO NODE     55.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   188.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0110
  CHANNEL BASE(FEET) =   12.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.097
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.79
  AVERAGE FLOW DEPTH(FEET) =   0.08   TRAVEL TIME(MIN.) =   1.75
  Tc(MIN.) =    5.02
  SUBAREA AREA(ACRES) =     0.35       SUBAREA RUNOFF(CFS) =    2.09
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.840
  TOTAL AREA(ACRES) =        0.5         PEAK FLOW RATE(CFS) =       2.74

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.10   FLOW VELOCITY(FEET/SEC.) =   2.24
  LONGEST FLOWPATH FROM NODE     53.00 TO NODE     55.00 =     241.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     55.00 TO NODE     56.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0150
  FLOW LENGTH(FEET) =   105.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.00
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.74
  PIPE TRAVEL TIME(MIN.) =   0.29    Tc(MIN.) =    5.31
  LONGEST FLOWPATH FROM NODE     53.00 TO NODE     56.00 =     346.00 FEET.

+------------------------------------------------------------------------------+
| DRAINAGE SUBAREA 7C                                                          |
|                                                                              |
```

```
|                                                                              |
+------------------------------------------------------------------------------+

******************************************************************************
 FLOW PROCESS FROM NODE     56.00 TO NODE     56.00 IS CODE =  81
------------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.843
 LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  96
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.8400
 SUBAREA AREA(ACRES) =    0.25   SUBAREA RUNOFF(CFS) =    1.44
 TOTAL AREA(ACRES) =        0.7   TOTAL RUNOFF(CFS) =       4.08
 TC(MIN.) =    5.31

******************************************************************************
 FLOW PROCESS FROM NODE     56.00 TO NODE     56.00 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.) =    5.31
 RAINFALL INTENSITY(INCH/HR) =   6.84
 TOTAL STREAM AREA(ACRES) =     0.71
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.08

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        7.79    17.29        3.196          3.98
     2        4.08     5.31        6.843          0.71

 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        6.47     5.31       6.843
     2        9.69    17.29       3.196

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       9.69   Tc(MIN.) =   17.29
 TOTAL AREA(ACRES) =        4.7
 LONGEST FLOWPATH FROM NODE     41.00 TO NODE     56.00 =    1274.00 FEET.

******************************************************************************
 FLOW PROCESS FROM NODE     56.00 TO NODE     57.00 IS CODE =  41
------------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==============================================================================
 REPRESENTATIVE SLOPE =  0.0100
 FLOW LENGTH(FEET) =    76.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  10.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.06
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       9.69
 PIPE TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =   17.47
 LONGEST FLOWPATH FROM NODE     41.00 TO NODE     57.00 =    1350.00 FEET.

+------------------------------------------------------------------------------+
| DRAINAGE SUBAREA 8C                                                          |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.174
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8300
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  92
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6550
  SUBAREA AREA(ACRES) =    0.33   SUBAREA RUNOFF(CFS) =    0.87
  TOTAL AREA(ACRES) =        5.0   TOTAL RUNOFF(CFS) =      10.44
  TC(MIN.) =   17.47

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE    301.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0130
  FLOW LENGTH(FEET) =    23.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  10.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.94
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.44
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =   17.52
  LONGEST FLOWPATH FROM NODE     41.00 TO NODE    301.00 =    1373.00 FEET.

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 9C                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    301.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.169
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .3400
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  51
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6470
  SUBAREA AREA(ACRES) =    0.13   SUBAREA RUNOFF(CFS) =    0.14
  TOTAL AREA(ACRES) =        5.2   TOTAL RUNOFF(CFS) =      10.56
  TC(MIN.) =   17.52

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1D.1                                                    |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     61.00 TO NODE     62.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1452.00
  DOWNSTREAM ELEVATION(FEET) =   1429.00
  ELEVATION DIFFERENCE(FEET) =     23.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.684
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.899
  SUBAREA RUNOFF(CFS) =      1.01
```

```
 TOTAL AREA(ACRES) =      0.57   TOTAL RUNOFF(CFS) =      1.01

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1D.2                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
 FLOW PROCESS FROM NODE     62.00 TO NODE     63.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =   651.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0940
 CHANNEL BASE(FEET) =  100.00   "Z" FACTOR =   0.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.508
 RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .2700
 SOIL CLASSIFICATION IS "A"
 S.C.S. CURVE NUMBER (AMC II) =  45
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.63
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.31
 AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   8.27
 Tc(MIN.) =   14.96
 SUBAREA AREA(ACRES) =     5.18       SUBAREA RUNOFF(CFS) =    4.91
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.273
 TOTAL AREA(ACRES) =        5.8         PEAK FLOW RATE(CFS) =       5.51

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.04   FLOW VELOCITY(FEET/SEC.) =   1.56
 LONGEST FLOWPATH FROM NODE     61.00 TO NODE     63.00 =     751.00 FEET.

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1D.3                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
 FLOW PROCESS FROM NODE     63.00 TO NODE     64.00 IS CODE =  91
----------------------------------------------------------------------------
 >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0560
 CHANNEL LENGTH THRU SUBAREA(FEET) =   181.00
 "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.800
 PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
 PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
 MAXIMUM DEPTH(FEET) =   1.00
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.470
 RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  81
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      5.59
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.71
 AVERAGE FLOW DEPTH(FEET) =   0.80   FLOOD WIDTH(FEET) =    3.00
 "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.26   Tc(MIN.) =   15.22
 SUBAREA AREA(ACRES) =    0.10       SUBAREA RUNOFF(CFS) =    0.17
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.277
 TOTAL AREA(ACRES) =        5.8         PEAK FLOW RATE(CFS) =       5.61

        NOTE:TRAVEL TIME ESTIMATES BASED ON NORMAL DEPTH
        IN A FLOWING-FULL GUTTER(NORMAL DEPTH = GUTTER HIKE)


 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) =  0.80   FLOOD WIDTH(FEET) =    3.00
 FLOW VELOCITY(FEET/SEC.) =  11.71   DEPTH*VELOCITY(FT*FT/SEC) =   9.37
 LONGEST FLOWPATH FROM NODE     61.00 TO NODE     64.00 =     932.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     64.00 TO NODE     66.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =    41.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0120
  CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   0.330
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
  CHANNEL FLOW THRU SUBAREA(CFS) =       5.61
  FLOW VELOCITY(FEET/SEC.) =   4.53   FLOW DEPTH(FEET) =   0.30
  TRAVEL TIME(MIN.) =   0.15   Tc(MIN.) =   15.37
  LONGEST FLOWPATH FROM NODE     61.00 TO NODE     66.00 =     973.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     66.00 TO NODE     66.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.37
  RAINFALL INTENSITY(INCH/HR) =   3.45
  TOTAL STREAM AREA(ACRES) =     5.85
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.61

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2D                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     65.00 TO NODE     66.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    22.00
  UPSTREAM ELEVATION(FEET) =   1358.00
  DOWNSTREAM ELEVATION(FEET) =   1357.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.078
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.26
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.26

****************************************************************************
  FLOW PROCESS FROM NODE     66.00 TO NODE     66.00 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.) =    4.08
  RAINFALL INTENSITY(INCH/HR) =   7.11
  TOTAL STREAM AREA(ACRES) =     0.12
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.26

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        5.61    15.37        3.448          5.85
      2        0.26     4.08        7.114          0.12
```

```
  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        1.75     4.08       7.114
      2        5.74    15.37       3.448

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       5.74   Tc(MIN.) =   15.37
  TOTAL AREA(ACRES) =        6.0
  LONGEST FLOWPATH FROM NODE     61.00 TO NODE     66.00 =     973.00 FEET.

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1E                                                        |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     71.00 TO NODE     72.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2000
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  63
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    86.00
  UPSTREAM ELEVATION(FEET) =   1358.00
  DOWNSTREAM ELEVATION(FEET) =   1351.10
  ELEVATION DIFFERENCE(FEET) =      6.90
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.505
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.474
  SUBAREA RUNOFF(CFS) =      0.13
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.13
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        0.1  TC(MIN.) =      7.50
  PEAK FLOW RATE(CFS)   =       0.13
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2015 Advanced Engineering Software (aes)
              Ver. 22.0 Release Date: 07/01/2015  License ID 1510

                            Analysis prepared by:

                            DRC Engineering, Inc.
                      160 South Old Springs Road, Suite 210
                             Anaheim Hills, CA 92808
                                  714-685-6860

 ************************* DESCRIPTION OF STUDY *************************
* 19-132 GS VALLEY EXPANSION (28435 LIZARD ROCKS ROAD)                    *
* EXISTING CONDITION                                                      *
* 25-YEAR STORM EVENT                                                     *
 *************************************************************************

  FILE NAME: 19132E25.DAT
  TIME/DATE OF STUDY: 11:09 05/19/2021
--------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
--------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) =  25.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.000
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)   (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   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.*

+------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1A.1                                                  |
|                                                                        |
|                                                                        |
+------------------------------------------------------------------------+

**************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1384.70
  DOWNSTREAM ELEVATION(FEET) =   1371.50
  ELEVATION DIFFERENCE(FEET) =     13.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.684
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.554
  SUBAREA RUNOFF(CFS) =      0.26
```

```
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.26

+-------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1A.2                                                   |
|                                                                         |
|                                                                         |
+-------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   305.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0510
  CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.437
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  79
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.94
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.91
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   5.56
  Tc(MIN.) =   12.24
  SUBAREA AREA(ACRES) =     0.73       SUBAREA RUNOFF(CFS) =    1.36
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.402
  TOTAL AREA(ACRES) =        0.9         PEAK FLOW RATE(CFS) =       1.53

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.03   FLOW VELOCITY(FEET/SEC.) =   1.15
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     405.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE    100.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0120
  FLOW LENGTH(FEET) =    62.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS   4.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.22
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.53
  PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =   12.49
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE    100.00 =     467.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   12.49
  RAINFALL INTENSITY(INCH/HR) =   4.38
  TOTAL STREAM AREA(ACRES) =     0.86
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.53

+-------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2A.1                                                   |
|                                                                         |
|                                                                         |
+-------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE      4.00 TO NODE      5.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
================================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1404.00
  DOWNSTREAM ELEVATION(FEET) =   1399.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.422
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.647
  SUBAREA RUNOFF(CFS) =      0.68
  TOTAL AREA(ACRES) =      0.40   TOTAL RUNOFF(CFS) =      0.68

+------------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2A.2                                                        |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+

********************************************************************************
  FLOW PROCESS FROM NODE      5.00 TO NODE      6.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   465.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0590
  CHANNEL BASE(FEET) =   60.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.039
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.86
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.35
  AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   5.74
  Tc(MIN.) =   14.16
  SUBAREA AREA(ACRES) =     3.55       SUBAREA RUNOFF(CFS) =    4.30
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =        4.0         PEAK FLOW RATE(CFS) =       4.79

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.05   FLOW VELOCITY(FEET/SEC.) =   1.64
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE      6.00 =     565.00 FEET.

+------------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2A.3                                                        |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+

********************************************************************************
  FLOW PROCESS FROM NODE      6.00 TO NODE    100.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   278.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0520
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.729
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       5.06
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.48
  AVERAGE FLOW DEPTH(FEET) =   0.10   TRAVEL TIME(MIN.) =   1.87
  Tc(MIN.) =   16.03
  SUBAREA AREA(ACRES) =     0.41       SUBAREA RUNOFF(CFS) =    0.55
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.306
```

```
  TOTAL AREA(ACRES) =        4.4         PEAK FLOW RATE(CFS) =       4.97

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.10   FLOW VELOCITY(FEET/SEC.) =   2.43
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE    100.00 =     843.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 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.) =   16.03
  RAINFALL INTENSITY(INCH/HR) =   3.73
  TOTAL STREAM AREA(ACRES) =     4.36
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.97

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        1.53    12.49        4.380          0.86
      2        4.97    16.03        3.729          4.36

  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        5.40    12.49       4.380
      2        6.27    16.03       3.729

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       6.27   Tc(MIN.) =   16.03
  TOTAL AREA(ACRES) =        5.2
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE    100.00 =     843.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    35.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS   8.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.93
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.27
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =   16.12
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE    101.00 =     878.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    101.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.12
  RAINFALL INTENSITY(INCH/HR) =   3.71
  TOTAL STREAM AREA(ACRES) =     5.22
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.27

+---------------------------------------------------------------------------+
| DRAINAGE SUBAREA 3A.1                                                     |
|                                                                           |
|                                                                           |
+---------------------------------------------------------------------------+
```

```
****************************************************************************
  FLOW PROCESS FROM NODE      7.00 TO NODE      8.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1379.80
  DOWNSTREAM ELEVATION(FEET) =   1368.60
  ELEVATION DIFFERENCE(FEET) =     11.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.684
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.554
  SUBAREA RUNOFF(CFS) =      0.33
  TOTAL AREA(ACRES) =      0.17   TOTAL RUNOFF(CFS) =      0.33

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 3A.2                                                    |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE      8.00 TO NODE    101.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   294.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0440
  CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.540
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  79
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.96
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.96
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   5.13
  Tc(MIN.) =   11.81
  SUBAREA AREA(ACRES) =     0.65       SUBAREA RUNOFF(CFS) =    1.24
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.395
  TOTAL AREA(ACRES) =        0.8         PEAK FLOW RATE(CFS) =       1.47

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.04   FLOW VELOCITY(FEET/SEC.) =   1.20
  LONGEST FLOWPATH FROM NODE      7.00 TO NODE    101.00 =     394.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    101.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.81
  RAINFALL INTENSITY(INCH/HR) =   4.54
  TOTAL STREAM AREA(ACRES) =     0.82
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.47

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        6.27    16.12        3.714          5.22
      2        1.47    11.81        4.540          0.82

  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        6.60    11.81       4.540
      2        7.48    16.12       3.714

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       7.48   Tc(MIN.) =   16.12
  TOTAL AREA(ACRES) =        6.0
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE    101.00 =     878.00 FEET.

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1B                                                        |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     21.00 TO NODE     22.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (2.9 DU/AC OR LESS) RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  80
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =   1369.30
  DOWNSTREAM ELEVATION(FEET) =   1363.90
  ELEVATION DIFFERENCE(FEET) =      5.40
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.390
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.747
  SUBAREA RUNOFF(CFS) =      0.46
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.46

****************************************************************************
  FLOW PROCESS FROM NODE     22.00 TO NODE     23.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    94.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   6.0 INCH PIPE IS   4.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.28
  GIVEN PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.46
  PIPE TRAVEL TIME(MIN.) =   0.48    Tc(MIN.) =    6.87
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     23.00 =     189.00 FEET.

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2B                                                        |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     23.00 TO NODE     23.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.440
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5475
  SUBAREA AREA(ACRES) =    0.05   SUBAREA RUNOFF(CFS) =    0.27
  TOTAL AREA(ACRES) =        0.2   TOTAL RUNOFF(CFS) =       0.71
  TC(MIN.) =    6.87
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     23.00 TO NODE    200.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0640
  FLOW LENGTH(FEET) =    13.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   6.0 INCH PIPE IS   2.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.40
  GIVEN PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.71
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =    6.90
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE    200.00 =     202.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE     24.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0180
  FLOW LENGTH(FEET) =    99.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   6.0 INCH PIPE IS   4.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.48
  GIVEN PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.71
  PIPE TRAVEL TIME(MIN.) =   0.37    Tc(MIN.) =    7.27
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     24.00 =     301.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     24.00 TO NODE     26.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =    12.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0170
  CHANNEL BASE(FEET) =    6.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.71
  FLOW VELOCITY(FEET/SEC.) =   2.02   FLOW DEPTH(FEET) =   0.06
  TRAVEL TIME(MIN.) =   0.10   Tc(MIN.) =    7.36
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     26.00 =     313.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     26.00 TO NODE     26.00 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.) =    7.36
  RAINFALL INTENSITY(INCH/HR) =   6.16
  TOTAL STREAM AREA(ACRES) =     0.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.71

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 3B                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE     26.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    89.00
  UPSTREAM ELEVATION(FEET) =   1364.10
  DOWNSTREAM ELEVATION(FEET) =   1358.00
  ELEVATION DIFFERENCE(FEET) =      6.10
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.324
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.27
  TOTAL AREA(ACRES) =      0.04   TOTAL RUNOFF(CFS) =      0.27

****************************************************************************
  FLOW PROCESS FROM NODE     26.00 TO NODE     26.00 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.) =    2.32
  RAINFALL INTENSITY(INCH/HR) =   7.90
  TOTAL STREAM AREA(ACRES) =     0.04
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.27

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        0.71     7.36        6.157          0.20
      2        0.27     2.32        7.904          0.04

  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        0.49     2.32       7.904
      2        0.91     7.36       6.157

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       0.91   Tc(MIN.) =    7.36
  TOTAL AREA(ACRES) =        0.2
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     26.00 =     313.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     26.00 TO NODE    201.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =     1.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   3.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.98
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.91
  PIPE TRAVEL TIME(MIN.) =   0.00    Tc(MIN.) =    7.37
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE    201.00 =     314.00 FEET.

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 4B                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     27.00 TO NODE     28.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
```

```
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    60.00
  UPSTREAM ELEVATION(FEET) =   1368.40
  DOWNSTREAM ELEVATION(FEET) =   1362.20
  ELEVATION DIFFERENCE(FEET) =      6.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.683
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.93
  TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      0.93

****************************************************************************
  FLOW PROCESS FROM NODE     28.00 TO NODE    202.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    64.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   4.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.90
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.93
  PIPE TRAVEL TIME(MIN.) =   0.27    Tc(MIN.) =    1.96
  LONGEST FLOWPATH FROM NODE     27.00 TO NODE    202.00 =     124.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    202.00 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.) =    1.96
  RAINFALL INTENSITY(INCH/HR) =   7.90
  TOTAL STREAM AREA(ACRES) =     0.14
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.93

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 5B                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     29.00 TO NODE     30.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    54.00
  UPSTREAM ELEVATION(FEET) =   1364.30
  DOWNSTREAM ELEVATION(FEET) =   1362.00
  ELEVATION DIFFERENCE(FEET) =      2.30
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.122
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.40
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.40

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE    202.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0380
  FLOW LENGTH(FEET) =    15.00   MANNING'S N =  0.012
```

```
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   1.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.92
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.40
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    2.17
  LONGEST FLOWPATH FROM NODE     29.00 TO NODE    202.00 =      69.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    202.00 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.) =    2.17
  RAINFALL INTENSITY(INCH/HR) =   7.90
  TOTAL STREAM AREA(ACRES) =     0.06
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.40

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        0.93     1.96        7.904          0.14
      2        0.40     2.17        7.904          0.06

  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        1.29     1.96       7.904
      2        1.33     2.17       7.904

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       1.33   Tc(MIN.) =    2.17
  TOTAL AREA(ACRES) =        0.2
  LONGEST FLOWPATH FROM NODE     27.00 TO NODE    202.00 =     124.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    203.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.1100
  FLOW LENGTH(FEET) =    54.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   2.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.16
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.33
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =    2.26
  LONGEST FLOWPATH FROM NODE     27.00 TO NODE    203.00 =     178.00 FEET.

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 6B                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    203.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
```

```
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8400
  SUBAREA AREA(ACRES) =    0.00   SUBAREA RUNOFF(CFS) =    0.03
  TOTAL AREA(ACRES) =        0.2   TOTAL RUNOFF(CFS) =       1.36
  TC(MIN.) =    2.26

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 7B.1                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     32.00 TO NODE     33.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1361.10
  DOWNSTREAM ELEVATION(FEET) =   1358.60
  ELEVATION DIFFERENCE(FEET) =      2.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.863
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.53
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.53

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 7B.2                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     34.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =    36.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0360
  CHANNEL BASE(FEET) =    8.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.12
  AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   0.28
  Tc(MIN.) =    3.15
  SUBAREA AREA(ACRES) =     0.02       SUBAREA RUNOFF(CFS) =    0.13
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.840
  TOTAL AREA(ACRES) =        0.1         PEAK FLOW RATE(CFS) =       0.66

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.04   FLOW VELOCITY(FEET/SEC.) =   2.02
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     34.00 =     116.00 FEET.

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1C.1                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     41.00 TO NODE     42.00 IS CODE =  21
----------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1401.00
  DOWNSTREAM ELEVATION(FEET) =   1397.00
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.072
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.382
  SUBAREA RUNOFF(CFS) =      0.50
  TOTAL AREA(ACRES) =      0.31   TOTAL RUNOFF(CFS) =      0.50

+------------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1C.2                                                        |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+

********************************************************************************
  FLOW PROCESS FROM NODE     42.00 TO NODE     43.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   380.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0710
  CHANNEL BASE(FEET) =   60.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.012
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  79
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.21
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   5.24
  Tc(MIN.) =   14.31
  SUBAREA AREA(ACRES) =     1.80       SUBAREA RUNOFF(CFS) =    3.03
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.402
  TOTAL AREA(ACRES) =        2.1         PEAK FLOW RATE(CFS) =       3.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.04   FLOW VELOCITY(FEET/SEC.) =   1.61
  LONGEST FLOWPATH FROM NODE     41.00 TO NODE     43.00 =     480.00 FEET.

+------------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1C.3                                                        |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+

********************************************************************************
  FLOW PROCESS FROM NODE     43.00 TO NODE     44.00 IS CODE =  91
--------------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
================================================================================
  REPRESENTATIVE SLOPE =  0.0270
  CHANNEL LENGTH THRU SUBAREA(FEET) =   371.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.090
  PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   0.50
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.731
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8300
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  92
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      4.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.62
  AVERAGE FLOW DEPTH(FEET) =   0.19   FLOOD WIDTH(FEET) =   13.98
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.71   Tc(MIN.) =   16.01
```

```
  SUBAREA AREA(ACRES) =    0.44       SUBAREA RUNOFF(CFS) =    1.36
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.476
  TOTAL AREA(ACRES) =        2.5         PEAK FLOW RATE(CFS) =       4.53

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.20   FLOOD WIDTH(FEET) =   14.77
  FLOW VELOCITY(FEET/SEC.) =   3.65   DEPTH*VELOCITY(FT*FT/SEC) =   0.72
  LONGEST FLOWPATH FROM NODE     41.00 TO NODE     44.00 =     851.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     44.00 TO NODE     45.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0130
  FLOW LENGTH(FEET) =   166.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.44
  GIVEN PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.53
  PIPE TRAVEL TIME(MIN.) =   0.43    Tc(MIN.) =   16.44
  LONGEST FLOWPATH FROM NODE     41.00 TO NODE     45.00 =    1017.00 FEET.

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2C                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     45.00 TO NODE     45.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.668
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5445
  SUBAREA AREA(ACRES) =    0.59   SUBAREA RUNOFF(CFS) =    1.82
  TOTAL AREA(ACRES) =        3.1   TOTAL RUNOFF(CFS) =       6.27
  TC(MIN.) =   16.44

****************************************************************************
  FLOW PROCESS FROM NODE     45.00 TO NODE     45.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 3C.1                                                    |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     46.00 TO NODE     47.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  ARTIICIAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .8700
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
  UPSTREAM ELEVATION(FEET) =   1370.50
  DOWNSTREAM ELEVATION(FEET) =   1365.90
  ELEVATION DIFFERENCE(FEET) =      4.60
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.280
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
```

```
  SUBAREA RUNOFF(CFS) =      0.28
  TOTAL AREA(ACRES) =      0.04   TOTAL RUNOFF(CFS) =      0.28

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 3C.2                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     47.00 TO NODE     48.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  CHANNEL LENGTH THRU SUBAREA(FEET) =   297.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.090
  PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   0.50
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      1.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.61
  AVERAGE FLOW DEPTH(FEET) =   0.14   FLOOD WIDTH(FEET) =    8.52
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.90   Tc(MIN.) =    4.18
  SUBAREA AREA(ACRES) =    0.32       SUBAREA RUNOFF(CFS) =    2.12
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.843
  TOTAL AREA(ACRES) =        0.4         PEAK FLOW RATE(CFS) =       2.40

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.17   FLOOD WIDTH(FEET) =   11.64
  FLOW VELOCITY(FEET/SEC.) =   2.90   DEPTH*VELOCITY(FT*FT/SEC) =   0.48
  LONGEST FLOWPATH FROM NODE     46.00 TO NODE     48.00 =     387.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     48.00 TO NODE    300.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0110
  FLOW LENGTH(FEET) =    34.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.16
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.40
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =    4.29
  LONGEST FLOWPATH FROM NODE     46.00 TO NODE    300.00 =     421.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    300.00 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.) =    4.29
  RAINFALL INTENSITY(INCH/HR) =   7.90
  TOTAL STREAM AREA(ACRES) =     0.36
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.40

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 4C.1                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     49.00 TO NODE     50.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  ARTIICIAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .8700
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    60.00
  UPSTREAM ELEVATION(FEET) =   1370.50
  DOWNSTREAM ELEVATION(FEET) =   1365.40
  ELEVATION DIFFERENCE(FEET) =      5.10
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.571
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.21
  TOTAL AREA(ACRES) =      0.03   TOTAL RUNOFF(CFS) =      0.21

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 4C.2                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     50.00 TO NODE     51.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =    70.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0900
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   0.330
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  ARTIICIAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .8700
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.89
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   0.40
  Tc(MIN.) =    1.97
  SUBAREA AREA(ACRES) =     0.01       SUBAREA RUNOFF(CFS) =    0.07
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.870
  TOTAL AREA(ACRES) =        0.0         PEAK FLOW RATE(CFS) =       0.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.03   FLOW VELOCITY(FEET/SEC.) =   2.74
  LONGEST FLOWPATH FROM NODE     49.00 TO NODE     51.00 =     130.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     51.00 TO NODE    300.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    27.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   2.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.72
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.28
  PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =    2.14
  LONGEST FLOWPATH FROM NODE     49.00 TO NODE    300.00 =     157.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    300.00 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.) =    2.14
  RAINFALL INTENSITY(INCH/HR) =   7.90
  TOTAL STREAM AREA(ACRES) =     0.04
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.28

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        2.40     4.29        7.904          0.36
      2        0.28     2.14        7.904          0.04

  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        1.47     2.14       7.904
      2        2.67     4.29       7.904

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       2.67   Tc(MIN.) =    4.29
  TOTAL AREA(ACRES) =        0.4
  LONGEST FLOWPATH FROM NODE     46.00 TO NODE    300.00 =     421.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE     45.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0220
  FLOW LENGTH(FEET) =    64.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   5.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.83
  GIVEN PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.67
  PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =    4.44
  LONGEST FLOWPATH FROM NODE     46.00 TO NODE     45.00 =     485.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     45.00 TO NODE     45.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        2.67     4.44       7.904        0.40
  LONGEST FLOWPATH FROM NODE     46.00 TO NODE     45.00 =     485.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        6.27    16.44       3.668        3.14
  LONGEST FLOWPATH FROM NODE     41.00 TO NODE     45.00 =    1017.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1       4.37       4.44        7.904
      2       7.51      16.44        3.668

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       7.51   Tc(MIN.) =   16.44
  TOTAL AREA(ACRES) =        3.5
```

```
****************************************************************************
 FLOW PROCESS FROM NODE     45.00 TO NODE     45.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE     45.00 TO NODE     52.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0150
 FLOW LENGTH(FEET) =   173.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.72
 GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       7.51
 PIPE TRAVEL TIME(MIN.) =   0.37    Tc(MIN.) =   16.82
 LONGEST FLOWPATH FROM NODE     41.00 TO NODE     52.00 =    1190.00 FEET.

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 5C                                                        |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
 FLOW PROCESS FROM NODE     52.00 TO NODE     52.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.615
 LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  96
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.6075
 SUBAREA AREA(ACRES) =    0.44   SUBAREA RUNOFF(CFS) =    1.34
 TOTAL AREA(ACRES) =        4.0   TOTAL RUNOFF(CFS) =       8.74
 TC(MIN.) =   16.82

****************************************************************************
 FLOW PROCESS FROM NODE     52.00 TO NODE     56.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0100
 FLOW LENGTH(FEET) =    84.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  10.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.88
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       8.74
 PIPE TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =   17.02
 LONGEST FLOWPATH FROM NODE     41.00 TO NODE     56.00 =    1274.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     56.00 TO NODE     56.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   17.02
 RAINFALL INTENSITY(INCH/HR) =   3.59
 TOTAL STREAM AREA(ACRES) =     3.98
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.74

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 6C.1                                                      |
|                                                                            |
```

```
|                                                                              |
+------------------------------------------------------------------------------+

******************************************************************************
  FLOW PROCESS FROM NODE     53.00 TO NODE     54.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    53.00
  UPSTREAM ELEVATION(FEET) =   1359.30
  DOWNSTREAM ELEVATION(FEET) =   1358.70
  ELEVATION DIFFERENCE(FEET) =      0.60
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.269
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.73
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.73

+------------------------------------------------------------------------------+
| DRAINAGE SUBAREA 6C.2                                                        |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+

******************************************************************************
  FLOW PROCESS FROM NODE     54.00 TO NODE     55.00 IS CODE =  51
------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   188.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0110
  CHANNEL BASE(FEET) =   12.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.95
  AVERAGE FLOW DEPTH(FEET) =   0.08   TRAVEL TIME(MIN.) =   1.61
  Tc(MIN.) =    4.88
  SUBAREA AREA(ACRES) =     0.35       SUBAREA RUNOFF(CFS) =    2.32
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.840
  TOTAL AREA(ACRES) =        0.5         PEAK FLOW RATE(CFS) =       3.05

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.11   FLOW VELOCITY(FEET/SEC.) =   2.32
  LONGEST FLOWPATH FROM NODE     53.00 TO NODE     55.00 =     241.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE     55.00 TO NODE     56.00 IS CODE =  41
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==============================================================================
  REPRESENTATIVE SLOPE =  0.0150
  FLOW LENGTH(FEET) =   105.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.15
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.05
  PIPE TRAVEL TIME(MIN.) =   0.28    Tc(MIN.) =    5.16
  LONGEST FLOWPATH FROM NODE     53.00 TO NODE     56.00 =     346.00 FEET.

+------------------------------------------------------------------------------+
| DRAINAGE SUBAREA 7C                                                          |
```

```
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+

******************************************************************************
  FLOW PROCESS FROM NODE     56.00 TO NODE     56.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.741
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8400
  SUBAREA AREA(ACRES) =    0.25   SUBAREA RUNOFF(CFS) =    1.63
  TOTAL AREA(ACRES) =        0.7   TOTAL RUNOFF(CFS) =       4.62
  TC(MIN.) =    5.16

******************************************************************************
  FLOW PROCESS FROM NODE     56.00 TO NODE     56.00 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) =   7.74
  TOTAL STREAM AREA(ACRES) =     0.71
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.62

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        8.74    17.02        3.587          3.98
      2        4.62     5.16        7.741          0.71

  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        7.27     5.16       7.741
      2       10.88    17.02       3.587

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      10.88   Tc(MIN.) =   17.02
  TOTAL AREA(ACRES) =        4.7
  LONGEST FLOWPATH FROM NODE     41.00 TO NODE     56.00 =    1274.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE     56.00 TO NODE     57.00 IS CODE =  41
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    76.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  11.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.28
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.88
  PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =   17.19
  LONGEST FLOWPATH FROM NODE     41.00 TO NODE     57.00 =    1350.00 FEET.

+------------------------------------------------------------------------------+
| DRAINAGE SUBAREA 8C                                                          |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.563
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8300
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  92
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6550
  SUBAREA AREA(ACRES) =    0.33   SUBAREA RUNOFF(CFS) =    0.98
  TOTAL AREA(ACRES) =        5.0   TOTAL RUNOFF(CFS) =      11.72
  TC(MIN.) =   17.19

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE    301.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0130
  FLOW LENGTH(FEET) =    23.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  11.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.18
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.72
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =   17.24
  LONGEST FLOWPATH FROM NODE     41.00 TO NODE    301.00 =    1373.00 FEET.

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 9C                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    301.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.557
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .3400
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  51
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6470
  SUBAREA AREA(ACRES) =    0.13   SUBAREA RUNOFF(CFS) =    0.16
  TOTAL AREA(ACRES) =        5.2   TOTAL RUNOFF(CFS) =      11.85
  TC(MIN.) =   17.24

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1D.1                                                    |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     61.00 TO NODE     62.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1452.00
  DOWNSTREAM ELEVATION(FEET) =   1429.00
  ELEVATION DIFFERENCE(FEET) =     23.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.684
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.554
```

```
  SUBAREA RUNOFF(CFS) =      1.12
  TOTAL AREA(ACRES) =      0.57   TOTAL RUNOFF(CFS) =      1.12

+---------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1D.2                                                     |
|                                                                           |
|                                                                           |
+---------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     62.00 TO NODE     63.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   651.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0940
  CHANNEL BASE(FEET) =  100.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.077
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .2700
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  45
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.13
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.49
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   7.27
  Tc(MIN.) =   13.95
  SUBAREA AREA(ACRES) =     5.18       SUBAREA RUNOFF(CFS) =    5.70
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.273
  TOTAL AREA(ACRES) =        5.8         PEAK FLOW RATE(CFS) =       6.40

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.04   FLOW VELOCITY(FEET/SEC.) =   1.81
  LONGEST FLOWPATH FROM NODE     61.00 TO NODE     63.00 =     751.00 FEET.

+---------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1D.3                                                     |
|                                                                           |
|                                                                           |
+---------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     63.00 TO NODE     64.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0560
  CHANNEL LENGTH THRU SUBAREA(FEET) =   181.00
  "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.800
  PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   1.00
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.030
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      6.50
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.71
  AVERAGE FLOW DEPTH(FEET) =   0.80   FLOOD WIDTH(FEET) =    3.00
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.26   Tc(MIN.) =   14.21
  SUBAREA AREA(ACRES) =    0.10       SUBAREA RUNOFF(CFS) =    0.19
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.277
  TOTAL AREA(ACRES) =        5.8         PEAK FLOW RATE(CFS) =       6.52

         NOTE:TRAVEL TIME ESTIMATES BASED ON NORMAL DEPTH
         IN A FLOWING-FULL GUTTER(NORMAL DEPTH = GUTTER HIKE)


  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.80   FLOOD WIDTH(FEET) =    3.00
  FLOW VELOCITY(FEET/SEC.) =  11.71   DEPTH*VELOCITY(FT*FT/SEC) =   9.37
```

```
 LONGEST FLOWPATH FROM NODE     61.00 TO NODE     64.00 =     932.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     64.00 TO NODE     66.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =    41.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0120
 CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   0.330
 MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
 CHANNEL FLOW THRU SUBAREA(CFS) =       6.52
 FLOW VELOCITY(FEET/SEC.) =   4.77   FLOW DEPTH(FEET) =   0.33
 TRAVEL TIME(MIN.) =   0.14   Tc(MIN.) =   14.35
 LONGEST FLOWPATH FROM NODE     61.00 TO NODE     66.00 =     973.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     66.00 TO NODE     66.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   14.35
 RAINFALL INTENSITY(INCH/HR) =   4.00
 TOTAL STREAM AREA(ACRES) =     5.85
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.52

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2D                                                        |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
 FLOW PROCESS FROM NODE     65.00 TO NODE     66.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  85
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    22.00
 UPSTREAM ELEVATION(FEET) =   1358.00
 DOWNSTREAM ELEVATION(FEET) =   1357.00
 ELEVATION DIFFERENCE(FEET) =      1.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.078
   25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.28
 TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.28

****************************************************************************
 FLOW PROCESS FROM NODE     66.00 TO NODE     66.00 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.) =    4.08
 RAINFALL INTENSITY(INCH/HR) =   7.90
 TOTAL STREAM AREA(ACRES) =     0.12
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.28

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        6.52    14.35        4.004          5.85
     2        0.28     4.08        7.904          0.12
```

```
  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        2.14     4.08       7.904
      2        6.66    14.35       4.004

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       6.66   Tc(MIN.) =   14.35
  TOTAL AREA(ACRES) =        6.0
  LONGEST FLOWPATH FROM NODE     61.00 TO NODE     66.00 =     973.00 FEET.

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1E                                                        |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     71.00 TO NODE     72.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2000
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  63
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    86.00
  UPSTREAM ELEVATION(FEET) =   1358.00
  DOWNSTREAM ELEVATION(FEET) =   1351.10
  ELEVATION DIFFERENCE(FEET) =      6.90
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.505
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.083
  SUBAREA RUNOFF(CFS) =      0.15
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.15
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        0.1  TC(MIN.) =      7.50
  PEAK FLOW RATE(CFS)   =       0.15
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2015 Advanced Engineering Software (aes)
              Ver. 22.0 Release Date: 07/01/2015  License ID 1510

                            Analysis prepared by:

                            DRC Engineering, Inc.
                      160 South Old Springs Road, Suite 210
                             Anaheim Hills, CA 92808
                                  714-685-6860

 ************************* DESCRIPTION OF STUDY *************************
* 19-132 GS VALLEY EXPANSION (28435 LIZARD ROCKS ROAD)                    *
* EXISTING CONDITION                                                      *
* 100-YEAR STORM EVENT                                                    *
 ************************************************************************

  FILE NAME: 19132E00.DAT
  TIME/DATE OF STUDY: 11:10 05/19/2021
------------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   4.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.    (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)   (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   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.*

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1A.1                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

******************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1384.70
  DOWNSTREAM ELEVATION(FEET) =   1371.50
  ELEVATION DIFFERENCE(FEET) =     13.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.684
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.832
  SUBAREA RUNOFF(CFS) =      0.38
```

```
  TOTAL AREA(ACRES) =      0.13   TOTAL RUNOFF(CFS) =      0.38

+-------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1A.2                                                   |
|                                                                         |
|                                                                         |
+-------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   305.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0510
  CHANNEL BASE(FEET) =   40.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.989
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  79
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.46
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.09
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   4.66
  Tc(MIN.) =   11.35
  SUBAREA AREA(ACRES) =     0.73       SUBAREA RUNOFF(CFS) =    2.14
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.402
  TOTAL AREA(ACRES) =        0.9         PEAK FLOW RATE(CFS) =       2.42

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.04   FLOW VELOCITY(FEET/SEC.) =   1.41
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     405.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE    100.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0120
  FLOW LENGTH(FEET) =    62.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS   5.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.83
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.42
  PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =   11.56
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE    100.00 =     467.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 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.) =   11.56
  RAINFALL INTENSITY(INCH/HR) =   6.90
  TOTAL STREAM AREA(ACRES) =     0.86
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.42

+-------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2A.1                                                   |
|                                                                         |
|                                                                         |
+-------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE      4.00 TO NODE      5.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
================================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1404.00
  DOWNSTREAM ELEVATION(FEET) =   1399.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.422
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.470
  SUBAREA RUNOFF(CFS) =      1.02
  TOTAL AREA(ACRES) =      0.40   TOTAL RUNOFF(CFS) =      1.02

+------------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2A.2                                                        |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+

********************************************************************************
  FLOW PROCESS FROM NODE      5.00 TO NODE      6.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   465.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0590
  CHANNEL BASE(FEET) =   60.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.229
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.40
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.51
  AVERAGE FLOW DEPTH(FEET) =   0.05   TRAVEL TIME(MIN.) =   5.14
  Tc(MIN.) =   13.56
  SUBAREA AREA(ACRES) =     3.55       SUBAREA RUNOFF(CFS) =    6.63
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =        4.0         PEAK FLOW RATE(CFS) =       7.38

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.06   FLOW VELOCITY(FEET/SEC.) =   1.93
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE      6.00 =     565.00 FEET.

+------------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2A.3                                                        |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+

********************************************************************************
  FLOW PROCESS FROM NODE      6.00 TO NODE    100.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   278.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0520
  CHANNEL BASE(FEET) =   20.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.798
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .3600
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  76
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       7.81
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.90
  AVERAGE FLOW DEPTH(FEET) =   0.13   TRAVEL TIME(MIN.) =   1.60
  Tc(MIN.) =   15.16
  SUBAREA AREA(ACRES) =     0.41       SUBAREA RUNOFF(CFS) =    0.86
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.306
```

```
  TOTAL AREA(ACRES) =        4.4         PEAK FLOW RATE(CFS) =       7.73

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.13   FLOW VELOCITY(FEET/SEC.) =   2.91
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE    100.00 =     843.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 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.) =   15.16
  RAINFALL INTENSITY(INCH/HR) =   5.80
  TOTAL STREAM AREA(ACRES) =     4.36
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.73

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        2.42    11.56        6.905          0.86
      2        7.73    15.16        5.798          4.36

  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        8.31    11.56       6.905
      2        9.75    15.16       5.798

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       9.75   Tc(MIN.) =   15.16
  TOTAL AREA(ACRES) =        5.2
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE    100.00 =     843.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    35.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  11.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.67
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.75
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =   15.25
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE    101.00 =     878.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    101.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.25
  RAINFALL INTENSITY(INCH/HR) =   5.78
  TOTAL STREAM AREA(ACRES) =     5.22
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.75

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 3A.1                                                    |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+
```

```
****************************************************************************
  FLOW PROCESS FROM NODE      7.00 TO NODE      8.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1379.80
  DOWNSTREAM ELEVATION(FEET) =   1368.60
  ELEVATION DIFFERENCE(FEET) =     11.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.684
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.832
  SUBAREA RUNOFF(CFS) =      0.50
  TOTAL AREA(ACRES) =      0.17   TOTAL RUNOFF(CFS) =      0.50

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 3A.2                                                    |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE      8.00 TO NODE    101.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   294.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0440
  CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.240
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  79
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.49
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.21
  AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   4.06
  Tc(MIN.) =   10.74
  SUBAREA AREA(ACRES) =     0.65       SUBAREA RUNOFF(CFS) =    1.98
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.395
  TOTAL AREA(ACRES) =        0.8         PEAK FLOW RATE(CFS) =       2.35

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.05   FLOW VELOCITY(FEET/SEC.) =   1.55
  LONGEST FLOWPATH FROM NODE      7.00 TO NODE    101.00 =     394.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    101.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.74
  RAINFALL INTENSITY(INCH/HR) =   7.24
  TOTAL STREAM AREA(ACRES) =     0.82
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.35

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        9.75    15.25        5.776          5.22
      2        2.35    10.74        7.240          0.82

  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       10.13    10.74       7.240
      2       11.63    15.25       5.776

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      11.63   Tc(MIN.) =   15.25
  TOTAL AREA(ACRES) =        6.0
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE    101.00 =     878.00 FEET.

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1B                                                        |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     21.00 TO NODE     22.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  RESIDENTIAL (2.9 DU/AC OR LESS) RUNOFF COEFFICIENT = .4500
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  80
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    95.00
  UPSTREAM ELEVATION(FEET) =   1369.30
  DOWNSTREAM ELEVATION(FEET) =   1363.90
  ELEVATION DIFFERENCE(FEET) =      5.40
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.390
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 10.121
  SUBAREA RUNOFF(CFS) =      0.68
  TOTAL AREA(ACRES) =      0.15   TOTAL RUNOFF(CFS) =      0.68

****************************************************************************
  FLOW PROCESS FROM NODE     22.00 TO NODE     23.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    94.00   MANNING'S N =  0.012
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.48
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.68
  PIPE TRAVEL TIME(MIN.) =   0.45    Tc(MIN.) =    6.84
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     23.00 =     189.00 FEET.

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2B                                                        |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     23.00 TO NODE     23.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.686
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5475
  SUBAREA AREA(ACRES) =    0.05   SUBAREA RUNOFF(CFS) =    0.41
  TOTAL AREA(ACRES) =        0.2   TOTAL RUNOFF(CFS) =       1.06
  TC(MIN.) =    6.84
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     23.00 TO NODE    200.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0640
  FLOW LENGTH(FEET) =    13.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   6.0 INCH PIPE IS   3.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.10
  GIVEN PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.06
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =    6.87
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE    200.00 =     202.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE     24.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0180
  FLOW LENGTH(FEET) =    99.00   MANNING'S N =  0.012
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.40
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.06
  PIPE TRAVEL TIME(MIN.) =   0.31    Tc(MIN.) =    7.17
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     24.00 =     301.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     24.00 TO NODE     26.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =    12.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0170
  CHANNEL BASE(FEET) =    6.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
  CHANNEL FLOW THRU SUBAREA(CFS) =       1.06
  FLOW VELOCITY(FEET/SEC.) =   2.23   FLOW DEPTH(FEET) =   0.08
  TRAVEL TIME(MIN.) =   0.09   Tc(MIN.) =    7.26
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     26.00 =     313.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     26.00 TO NODE     26.00 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.) =    7.26
  RAINFALL INTENSITY(INCH/HR) =   9.32
  TOTAL STREAM AREA(ACRES) =     0.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.06

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 3B                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE     26.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
```

```
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    89.00
  UPSTREAM ELEVATION(FEET) =   1364.10
  DOWNSTREAM ELEVATION(FEET) =   1358.00
  ELEVATION DIFFERENCE(FEET) =      6.10
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.324
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.40
  TOTAL AREA(ACRES) =      0.04   TOTAL RUNOFF(CFS) =      0.40

****************************************************************************
  FLOW PROCESS FROM NODE     26.00 TO NODE     26.00 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.) =    2.32
  RAINFALL INTENSITY(INCH/HR) =  11.86
  TOTAL STREAM AREA(ACRES) =     0.04
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.40

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        1.06     7.26        9.320          0.20
      2        0.40     2.32       11.856          0.04

  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        0.74     2.32      11.856
      2        1.37     7.26       9.320

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       1.37   Tc(MIN.) =    7.26
  TOTAL AREA(ACRES) =        0.2
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     26.00 =     313.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     26.00 TO NODE    201.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =     1.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   4.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.57
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.37
  PIPE TRAVEL TIME(MIN.) =   0.00    Tc(MIN.) =    7.27
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE    201.00 =     314.00 FEET.

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 4B                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     27.00 TO NODE     28.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
```

```
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    60.00
  UPSTREAM ELEVATION(FEET) =   1368.40
  DOWNSTREAM ELEVATION(FEET) =   1362.20
  ELEVATION DIFFERENCE(FEET) =      6.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.683
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.39
  TOTAL AREA(ACRES) =      0.14   TOTAL RUNOFF(CFS) =      1.39

****************************************************************************
  FLOW PROCESS FROM NODE     28.00 TO NODE    202.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    64.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   5.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.34
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.39
  PIPE TRAVEL TIME(MIN.) =   0.25    Tc(MIN.) =    1.93
  LONGEST FLOWPATH FROM NODE     27.00 TO NODE    202.00 =     124.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    202.00 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.) =    1.93
  RAINFALL INTENSITY(INCH/HR) =  11.86
  TOTAL STREAM AREA(ACRES) =     0.14
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.39

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 5B                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     29.00 TO NODE     30.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    54.00
  UPSTREAM ELEVATION(FEET) =   1364.30
  DOWNSTREAM ELEVATION(FEET) =   1362.00
  ELEVATION DIFFERENCE(FEET) =      2.30
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.122
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.60
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.60

****************************************************************************
  FLOW PROCESS FROM NODE     30.00 TO NODE    202.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
```

```
  REPRESENTATIVE SLOPE =  0.0380
  FLOW LENGTH(FEET) =    15.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   2.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.53
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.60
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    2.17
  LONGEST FLOWPATH FROM NODE     29.00 TO NODE    202.00 =      69.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    202.00 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.) =    2.17
  RAINFALL INTENSITY(INCH/HR) =  11.86
  TOTAL STREAM AREA(ACRES) =     0.06
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.60

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        1.39     1.93       11.856          0.14
      2        0.60     2.17       11.856          0.06

  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        1.93     1.93      11.856
      2        1.99     2.17      11.856

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       1.99   Tc(MIN.) =    2.17
  TOTAL AREA(ACRES) =        0.2
  LONGEST FLOWPATH FROM NODE     27.00 TO NODE    202.00 =     124.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    203.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.1100
  FLOW LENGTH(FEET) =    54.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   3.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.42
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.99
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    2.25
  LONGEST FLOWPATH FROM NODE     27.00 TO NODE    203.00 =     178.00 FEET.

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 6B                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    203.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
```

```
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8400
  SUBAREA AREA(ACRES) =    0.00   SUBAREA RUNOFF(CFS) =    0.05
  TOTAL AREA(ACRES) =        0.2   TOTAL RUNOFF(CFS) =       2.04
  TC(MIN.) =    2.25

+---------------------------------------------------------------------------+
| DRAINAGE SUBAREA 7B.1                                                     |
|                                                                           |
|                                                                           |
+---------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     32.00 TO NODE     33.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1361.10
  DOWNSTREAM ELEVATION(FEET) =   1358.60
  ELEVATION DIFFERENCE(FEET) =      2.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.863
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.80
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.80

+---------------------------------------------------------------------------+
| DRAINAGE SUBAREA 7B.2                                                     |
|                                                                           |
|                                                                           |
+---------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     34.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =    36.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0360
  CHANNEL BASE(FEET) =    8.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.30
  AVERAGE FLOW DEPTH(FEET) =   0.05   TRAVEL TIME(MIN.) =   0.26
  Tc(MIN.) =    3.12
  SUBAREA AREA(ACRES) =     0.02       SUBAREA RUNOFF(CFS) =    0.20
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.840
  TOTAL AREA(ACRES) =        0.1         PEAK FLOW RATE(CFS) =       1.00

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.05   FLOW VELOCITY(FEET/SEC.) =   2.56
  LONGEST FLOWPATH FROM NODE     32.00 TO NODE     34.00 =     116.00 FEET.

+---------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1C.1                                                     |
|                                                                           |
|                                                                           |
+---------------------------------------------------------------------------+

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

```
 FLOW PROCESS FROM NODE     41.00 TO NODE     42.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  85
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1401.00
 DOWNSTREAM ELEVATION(FEET) =   1397.00
 ELEVATION DIFFERENCE(FEET) =      4.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.072
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.074
 SUBAREA RUNOFF(CFS) =      0.75
 TOTAL AREA(ACRES) =      0.31   TOTAL RUNOFF(CFS) =      0.75

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1C.2                                                    |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
 FLOW PROCESS FROM NODE     42.00 TO NODE     43.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =   380.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0710
 CHANNEL BASE(FEET) =   60.00   "Z" FACTOR =   0.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.277
 RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  79
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.10
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.46
 AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   4.33
 Tc(MIN.) =   13.40
 SUBAREA AREA(ACRES) =     1.80       SUBAREA RUNOFF(CFS) =    4.75
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.402
 TOTAL AREA(ACRES) =        2.1         PEAK FLOW RATE(CFS) =       5.33

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.05   FLOW VELOCITY(FEET/SEC.) =   1.76
 LONGEST FLOWPATH FROM NODE     41.00 TO NODE     43.00 =     480.00 FEET.

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1C.3                                                    |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
 FLOW PROCESS FROM NODE     43.00 TO NODE     44.00 IS CODE =  91
----------------------------------------------------------------------------
 >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0270
 CHANNEL LENGTH THRU SUBAREA(FEET) =   371.00
 "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.090
 PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
 PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
 MAXIMUM DEPTH(FEET) =   0.50
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.840
 LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8300
 SOIL CLASSIFICATION IS "A"
 S.C.S. CURVE NUMBER (AMC II) =  92
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      6.40
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.90
```

```
  AVERAGE FLOW DEPTH(FEET) =   0.22   FLOOD WIDTH(FEET) =   17.27
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.59   Tc(MIN.) =   14.99
  SUBAREA AREA(ACRES) =    0.44       SUBAREA RUNOFF(CFS) =    2.13
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.476
  TOTAL AREA(ACRES) =        2.5         PEAK FLOW RATE(CFS) =       7.09

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.23   FLOOD WIDTH(FEET) =   18.05
  FLOW VELOCITY(FEET/SEC.) =   3.99   DEPTH*VELOCITY(FT*FT/SEC) =   0.92
  LONGEST FLOWPATH FROM NODE     41.00 TO NODE     44.00 =     851.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     44.00 TO NODE     45.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0130
  FLOW LENGTH(FEET) =   166.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS  11.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.01
  GIVEN PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.09
  PIPE TRAVEL TIME(MIN.) =   0.39    Tc(MIN.) =   15.38
  LONGEST FLOWPATH FROM NODE     41.00 TO NODE     45.00 =    1017.00 FEET.

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2C                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     45.00 TO NODE     45.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.743
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5445
  SUBAREA AREA(ACRES) =    0.59   SUBAREA RUNOFF(CFS) =    2.85
  TOTAL AREA(ACRES) =        3.1   TOTAL RUNOFF(CFS) =       9.82
  TC(MIN.) =   15.38

****************************************************************************
  FLOW PROCESS FROM NODE     45.00 TO NODE     45.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 3C.1                                                    |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     46.00 TO NODE     47.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  ARTIICIAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .8700
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
  UPSTREAM ELEVATION(FEET) =   1370.50
  DOWNSTREAM ELEVATION(FEET) =   1365.90
  ELEVATION DIFFERENCE(FEET) =      4.60
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.280
```

```
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
SUBAREA RUNOFF(CFS) =      0.41
TOTAL AREA(ACRES) =      0.04   TOTAL RUNOFF(CFS) =      0.41

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 3C.2                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
FLOW PROCESS FROM NODE     47.00 TO NODE     48.00 IS CODE =  91
----------------------------------------------------------------------------
>>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
REPRESENTATIVE SLOPE =  0.0200
CHANNEL LENGTH THRU SUBAREA(FEET) =   297.00
"V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.090
PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
MAXIMUM DEPTH(FEET) =   0.50
 100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
SOIL CLASSIFICATION IS "C"
S.C.S. CURVE NUMBER (AMC II) =  96
TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      2.01
TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.78
AVERAGE FLOW DEPTH(FEET) =   0.16   FLOOD WIDTH(FEET) =   10.70
"V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.78   Tc(MIN.) =    4.06
SUBAREA AREA(ACRES) =    0.32       SUBAREA RUNOFF(CFS) =    3.19
AREA-AVERAGE RUNOFF COEFFICIENT =  0.843
TOTAL AREA(ACRES) =        0.4         PEAK FLOW RATE(CFS) =       3.60

END OF SUBAREA "V" GUTTER HYDRAULICS:
DEPTH(FEET) =  0.19   FLOOD WIDTH(FEET) =   14.14
FLOW VELOCITY(FEET/SEC.) =   3.13   DEPTH*VELOCITY(FT*FT/SEC) =   0.60
LONGEST FLOWPATH FROM NODE     46.00 TO NODE     48.00 =     387.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE     48.00 TO NODE    300.00 IS CODE =  41
----------------------------------------------------------------------------
>>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
>>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
REPRESENTATIVE SLOPE =  0.0110
FLOW LENGTH(FEET) =    34.00   MANNING'S N =  0.012
DEPTH OF FLOW IN  12.0 INCH PIPE IS   9.2 INCHES
PIPE-FLOW VELOCITY(FEET/SEC.) =   5.56
GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
PIPE-FLOW(CFS) =       3.60
PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =    4.17
LONGEST FLOWPATH FROM NODE     46.00 TO NODE    300.00 =     421.00 FEET.

****************************************************************************
FLOW PROCESS FROM NODE    300.00 TO NODE    300.00 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.) =    4.17
RAINFALL INTENSITY(INCH/HR) =  11.86
TOTAL STREAM AREA(ACRES) =     0.36
PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.60

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 4C.1                                                      |
|                                                                            |
|                                                                            |
```

```
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     49.00 TO NODE     50.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  ARTIICIAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .8700
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    60.00
  UPSTREAM ELEVATION(FEET) =   1370.50
  DOWNSTREAM ELEVATION(FEET) =   1365.40
  ELEVATION DIFFERENCE(FEET) =      5.10
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.571
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.31
  TOTAL AREA(ACRES) =      0.03   TOTAL RUNOFF(CFS) =      0.31

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 4C.2                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     50.00 TO NODE     51.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =    70.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0900
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   0.330
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  ARTIICIAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .8700
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.36
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.40
  AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   0.34
  Tc(MIN.) =    1.91
  SUBAREA AREA(ACRES) =     0.01       SUBAREA RUNOFF(CFS) =    0.10
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.870
  TOTAL AREA(ACRES) =        0.0         PEAK FLOW RATE(CFS) =       0.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.04   FLOW VELOCITY(FEET/SEC.) =   3.34
  LONGEST FLOWPATH FROM NODE     49.00 TO NODE     51.00 =     130.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     51.00 TO NODE    300.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    27.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   2.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.10
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.41
  PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =    2.06
  LONGEST FLOWPATH FROM NODE     49.00 TO NODE    300.00 =     157.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    300.00 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.) =    2.06
  RAINFALL INTENSITY(INCH/HR) =  11.86
  TOTAL STREAM AREA(ACRES) =     0.04
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.41

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        3.60     4.17       11.856          0.36
      2        0.41     2.06       11.856          0.04

  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        2.19     2.06      11.856
      2        4.01     4.17      11.856

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       4.01   Tc(MIN.) =    4.17
  TOTAL AREA(ACRES) =        0.4
  LONGEST FLOWPATH FROM NODE     46.00 TO NODE    300.00 =     421.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE     45.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0220
  FLOW LENGTH(FEET) =    64.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   6.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.61
  GIVEN PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.01
  PIPE TRAVEL TIME(MIN.) =   0.14    Tc(MIN.) =    4.31
  LONGEST FLOWPATH FROM NODE     46.00 TO NODE     45.00 =     485.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     45.00 TO NODE     45.00 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        4.01     4.31      11.856        0.40
  LONGEST FLOWPATH FROM NODE     46.00 TO NODE     45.00 =     485.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        9.82    15.38       5.743        3.14
  LONGEST FLOWPATH FROM NODE     41.00 TO NODE     45.00 =    1017.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1       6.76       4.31       11.856
      2      11.76      15.38        5.743

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      11.76   Tc(MIN.) =   15.38
```

```
  TOTAL AREA(ACRES) =        3.5

****************************************************************************
  FLOW PROCESS FROM NODE     45.00 TO NODE     45.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     45.00 TO NODE     52.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0150
  FLOW LENGTH(FEET) =   173.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.46
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.76
  PIPE TRAVEL TIME(MIN.) =   0.34    Tc(MIN.) =   15.72
  LONGEST FLOWPATH FROM NODE     41.00 TO NODE     52.00 =    1190.00 FEET.

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 5C                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     52.00 TO NODE     52.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.662
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6075
  SUBAREA AREA(ACRES) =    0.44   SUBAREA RUNOFF(CFS) =    2.09
  TOTAL AREA(ACRES) =        4.0   TOTAL RUNOFF(CFS) =      13.69
  TC(MIN.) =   15.72

****************************************************************************
  FLOW PROCESS FROM NODE     52.00 TO NODE     56.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    84.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  13.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.70
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      13.69
  PIPE TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =   15.91
  LONGEST FLOWPATH FROM NODE     41.00 TO NODE     56.00 =    1274.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     56.00 TO NODE     56.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.91
  RAINFALL INTENSITY(INCH/HR) =   5.62
  TOTAL STREAM AREA(ACRES) =     3.98
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     13.69

+--------------------------------------------------------------------------+
```

```
| DRAINAGE SUBAREA 6C.1                                                          |
|                                                                                |
|                                                                                |
+--------------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     53.00 TO NODE     54.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    53.00
  UPSTREAM ELEVATION(FEET) =   1359.30
  DOWNSTREAM ELEVATION(FEET) =   1358.70
  ELEVATION DIFFERENCE(FEET) =      0.60
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.269
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.10
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      1.10

+--------------------------------------------------------------------------------+
| DRAINAGE SUBAREA 6C.2                                                          |
|                                                                                |
|                                                                                |
+--------------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     54.00 TO NODE     55.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   188.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0110
  CHANNEL BASE(FEET) =   12.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.28
  AVERAGE FLOW DEPTH(FEET) =   0.10   TRAVEL TIME(MIN.) =   1.38
  Tc(MIN.) =    4.65
  SUBAREA AREA(ACRES) =     0.35       SUBAREA RUNOFF(CFS) =    3.49
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.840
  TOTAL AREA(ACRES) =        0.5         PEAK FLOW RATE(CFS) =       4.58

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.14   FLOW VELOCITY(FEET/SEC.) =   2.72
  LONGEST FLOWPATH FROM NODE     53.00 TO NODE     55.00 =     241.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     55.00 TO NODE     56.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0150
  FLOW LENGTH(FEET) =   105.00   MANNING'S N =  0.012
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.83
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.58
  PIPE TRAVEL TIME(MIN.) =   0.30    Tc(MIN.) =    4.95
  LONGEST FLOWPATH FROM NODE     53.00 TO NODE     56.00 =     346.00 FEET.
```

```
+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 7C                                                        |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     56.00 TO NODE     56.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8400
  SUBAREA AREA(ACRES) =    0.25   SUBAREA RUNOFF(CFS) =    2.49
  TOTAL AREA(ACRES) =        0.7   TOTAL RUNOFF(CFS) =       7.07
  TC(MIN.) =    4.95

****************************************************************************
  FLOW PROCESS FROM NODE     56.00 TO NODE     56.00 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.) =    4.95
  RAINFALL INTENSITY(INCH/HR) =  11.86
  TOTAL STREAM AREA(ACRES) =     0.71
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.07

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       13.69    15.91        5.621          3.98
      2        7.07     4.95       11.856          0.71

  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       11.33     4.95      11.856
      2       17.04    15.91       5.621

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      17.04   Tc(MIN.) =   15.91
  TOTAL AREA(ACRES) =        4.7
  LONGEST FLOWPATH FROM NODE     41.00 TO NODE     56.00 =    1274.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     56.00 TO NODE     57.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    76.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.08
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      17.04
  PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =   16.06
  LONGEST FLOWPATH FROM NODE     41.00 TO NODE     57.00 =    1350.00 FEET.

+----------------------------------------------------------------------------+
```

```
| DRAINAGE SUBAREA 8C                                                          |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     57.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.585
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8300
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  92
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6550
  SUBAREA AREA(ACRES) =    0.33   SUBAREA RUNOFF(CFS) =    1.53
  TOTAL AREA(ACRES) =        5.0   TOTAL RUNOFF(CFS) =      18.36
  TC(MIN.) =   16.06

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE    301.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0130
  FLOW LENGTH(FEET) =    23.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  14.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.11
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      18.36
  PIPE TRAVEL TIME(MIN.) =   0.04    Tc(MIN.) =   16.10
  LONGEST FLOWPATH FROM NODE     41.00 TO NODE    301.00 =    1373.00 FEET.

+------------------------------------------------------------------------------+
| DRAINAGE SUBAREA 9C                                                          |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    301.00 TO NODE    301.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.576
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .3400
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  51
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6470
  SUBAREA AREA(ACRES) =    0.13   SUBAREA RUNOFF(CFS) =    0.25
  TOTAL AREA(ACRES) =        5.2   TOTAL RUNOFF(CFS) =      18.58
  TC(MIN.) =   16.10

+------------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1D.1                                                        |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     61.00 TO NODE     62.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1452.00
  DOWNSTREAM ELEVATION(FEET) =   1429.00
```

```
  ELEVATION DIFFERENCE(FEET) =     23.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.684
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.832
  SUBAREA RUNOFF(CFS) =      1.68
  TOTAL AREA(ACRES) =      0.57   TOTAL RUNOFF(CFS) =      1.68

+-------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1D.2                                                   |
|                                                                         |
|                                                                         |
+-------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     62.00 TO NODE     63.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   651.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0940
  CHANNEL BASE(FEET) =  100.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.482
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .2700
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  45
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.79
  AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   6.07
  Tc(MIN.) =   12.75
  SUBAREA AREA(ACRES) =     5.18       SUBAREA RUNOFF(CFS) =    9.07
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.273
  TOTAL AREA(ACRES) =        5.8         PEAK FLOW RATE(CFS) =      10.17

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.05   FLOW VELOCITY(FEET/SEC.) =   2.01
  LONGEST FLOWPATH FROM NODE     61.00 TO NODE     63.00 =     751.00 FEET.

+-------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1D.3                                                   |
|                                                                         |
|                                                                         |
+-------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     63.00 TO NODE     64.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0560
  CHANNEL LENGTH THRU SUBAREA(FEET) =   181.00
  "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.800
  PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.398
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     10.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.71
  AVERAGE FLOW DEPTH(FEET) =   0.80   FLOOD WIDTH(FEET) =    3.00
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.26   Tc(MIN.) =   13.01
  SUBAREA AREA(ACRES) =    0.10       SUBAREA RUNOFF(CFS) =    0.31
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.277
  TOTAL AREA(ACRES) =        5.8         PEAK FLOW RATE(CFS) =      10.35

         NOTE:TRAVEL TIME ESTIMATES BASED ON NORMAL DEPTH
         IN A FLOWING-FULL GUTTER(NORMAL DEPTH = GUTTER HIKE)
```

```
  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.80   FLOOD WIDTH(FEET) =    3.00
  FLOW VELOCITY(FEET/SEC.) =  11.71   DEPTH*VELOCITY(FT*FT/SEC) =   9.37
  LONGEST FLOWPATH FROM NODE     61.00 TO NODE     64.00 =     932.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     64.00 TO NODE     66.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =    41.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0120
  CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   0.330
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      10.35
  FLOW VELOCITY(FEET/SEC.) =   5.60   FLOW DEPTH(FEET) =   0.45
  TRAVEL TIME(MIN.) =   0.12   Tc(MIN.) =   13.13
  LONGEST FLOWPATH FROM NODE     61.00 TO NODE     66.00 =     973.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     66.00 TO NODE     66.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.13
  RAINFALL INTENSITY(INCH/HR) =   6.36
  TOTAL STREAM AREA(ACRES) =     5.85
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.35

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2D                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     65.00 TO NODE     66.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    22.00
  UPSTREAM ELEVATION(FEET) =   1358.00
  DOWNSTREAM ELEVATION(FEET) =   1357.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.078
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.43
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.43

****************************************************************************
  FLOW PROCESS FROM NODE     66.00 TO NODE     66.00 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.) =    4.08
  RAINFALL INTENSITY(INCH/HR) =  11.86
  TOTAL STREAM AREA(ACRES) =     0.12
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.43

  ** CONFLUENCE DATA **
```

```
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       10.35    13.13        6.360         5.85
      2        0.43     4.08       11.856         0.12

  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        3.64     4.08      11.856
      2       10.58    13.13       6.360

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      10.58   Tc(MIN.) =   13.13
  TOTAL AREA(ACRES) =        6.0
  LONGEST FLOWPATH FROM NODE     61.00 TO NODE     66.00 =     973.00 FEET.

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1E                                                        |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     71.00 TO NODE     72.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2000
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  63
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    86.00
  UPSTREAM ELEVATION(FEET) =   1358.00
  DOWNSTREAM ELEVATION(FEET) =   1351.10
  ELEVATION DIFFERENCE(FEET) =      6.90
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.505
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.124
  SUBAREA RUNOFF(CFS) =      0.22
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.22
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        0.1  TC(MIN.) =      7.50
  PEAK FLOW RATE(CFS)   =       0.22
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
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              Ver. 22.0 Release Date: 07/01/2015  License ID 1510

                            Analysis prepared by:

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 ************************* DESCRIPTION OF STUDY *************************
* 19-132 GS VALLEY EXPANSION (28435 LIZARD ROCKS ROAD)                    *
* PROPOSED CONDITION                                                      *
* 10-YEAR STORM EVENT                                                     *
 ************************************************************************

  FILE NAME: 19132P10.DAT
  TIME/DATE OF STUDY: 11:12 05/19/2021
------------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) =  10.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   2.700
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)   (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   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.*

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1A.1                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

******************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .6900
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  92
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    69.00
  UPSTREAM ELEVATION(FEET) =   1364.00
  DOWNSTREAM ELEVATION(FEET) =   1362.10
  ELEVATION DIFFERENCE(FEET) =      1.90
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.374
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.15
```

```
  TOTAL AREA(ACRES) =      0.03   TOTAL RUNOFF(CFS) =      0.15

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1A.2                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   162.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0390
  CHANNEL BASE(FEET) =   45.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.50
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.956
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .6900
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  92
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.62
  AVERAGE FLOW DEPTH(FEET) =   0.01   TRAVEL TIME(MIN.) =   4.38
  Tc(MIN.) =    8.76
  SUBAREA AREA(ACRES) =     0.12       SUBAREA RUNOFF(CFS) =    0.41
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.690
  TOTAL AREA(ACRES) =        0.1         PEAK FLOW RATE(CFS) =       0.51

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.02   FLOW VELOCITY(FEET/SEC.) =   0.63
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     231.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE    100.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0120
  FLOW LENGTH(FEET) =    62.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS   2.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.05
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.51
  PIPE TRAVEL TIME(MIN.) =   0.34    Tc(MIN.) =    9.10
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE    100.00 =     293.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2A.1                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE      4.00 TO NODE      5.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    49.00
  UPSTREAM ELEVATION(FEET) =   1363.70
```

```
  DOWNSTREAM ELEVATION(FEET) =   1363.20
  ELEVATION DIFFERENCE(FEET) =      0.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.254
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.18
  TOTAL AREA(ACRES) =      0.03   TOTAL RUNOFF(CFS) =      0.18

+---------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2A.2                                                     |
|                                                                           |
|                                                                           |
+---------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE      5.00 TO NODE      6.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0060
  CHANNEL LENGTH THRU SUBAREA(FEET) =    33.00
  "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.100
  PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   0.50
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      0.42
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.37
  AVERAGE FLOW DEPTH(FEET) =   0.14   FLOOD WIDTH(FEET) =    5.82
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.40   Tc(MIN.) =    3.65
  SUBAREA AREA(ACRES) =    0.08       SUBAREA RUNOFF(CFS) =    0.48
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.840
  TOTAL AREA(ACRES) =        0.1         PEAK FLOW RATE(CFS) =       0.66

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.16   FLOOD WIDTH(FEET) =    7.95
  FLOW VELOCITY(FEET/SEC.) =   1.46   DEPTH*VELOCITY(FT*FT/SEC) =   0.23
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE      6.00 =      82.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      6.00 TO NODE    400.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0050
  FLOW LENGTH(FEET) =   127.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   4.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.78
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.66
  PIPE TRAVEL TIME(MIN.) =   0.76    Tc(MIN.) =    4.42
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE    400.00 =     209.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    400.00 TO NODE    400.00 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.) =    4.42
  RAINFALL INTENSITY(INCH/HR) =   7.11
  TOTAL STREAM AREA(ACRES) =     0.11
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.66

+---------------------------------------------------------------------------+
```

```
| DRAINAGE SUBAREA 3A.1                                                          |
|                                                                                |
|                                                                                |
+--------------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE      7.00 TO NODE      8.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    60.00
  UPSTREAM ELEVATION(FEET) =   1364.50
  DOWNSTREAM ELEVATION(FEET) =   1363.30
  ELEVATION DIFFERENCE(FEET) =      1.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.877
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.48
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.48

+--------------------------------------------------------------------------------+
| DRAINAGE SUBAREA 3A.2                                                          |
|                                                                                |
|                                                                                |
+--------------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE      8.00 TO NODE      9.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0060
  CHANNEL LENGTH THRU SUBAREA(FEET) =    90.00
  "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.100
  PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   0.50
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      1.79
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.66
  AVERAGE FLOW DEPTH(FEET) =   0.22   FLOOD WIDTH(FEET) =   13.74
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.90   Tc(MIN.) =    3.78
  SUBAREA AREA(ACRES) =    0.44       SUBAREA RUNOFF(CFS) =    2.63
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.840
  TOTAL AREA(ACRES) =        0.5         PEAK FLOW RATE(CFS) =       3.11

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.26   FLOOD WIDTH(FEET) =   17.70
  FLOW VELOCITY(FEET/SEC.) =   1.83   DEPTH*VELOCITY(FT*FT/SEC) =   0.47
  LONGEST FLOWPATH FROM NODE      7.00 TO NODE      9.00 =     150.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      9.00 TO NODE    400.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0170
  FLOW LENGTH(FEET) =     6.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.48
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.11
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =    3.80
```

```
 LONGEST FLOWPATH FROM NODE      7.00 TO NODE    400.00 =     156.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    400.00 TO NODE    400.00 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.) =    3.80
 RAINFALL INTENSITY(INCH/HR) =   7.11
 TOTAL STREAM AREA(ACRES) =     0.52
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.11

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        0.66     4.42        7.114          0.11
     2        3.11     3.80        7.114          0.52

 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        3.67     3.80       7.114
     2        3.76     4.42       7.114

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       3.76   Tc(MIN.) =    4.42
 TOTAL AREA(ACRES) =        0.6
 LONGEST FLOWPATH FROM NODE      4.00 TO NODE    400.00 =     209.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    400.00 TO NODE    401.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0050
 FLOW LENGTH(FEET) =   227.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  15.0 INCH PIPE IS  10.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.25
 ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       3.76
 PIPE TRAVEL TIME(MIN.) =   0.89    Tc(MIN.) =    5.31
 LONGEST FLOWPATH FROM NODE      4.00 TO NODE    401.00 =     436.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    401.00 TO NODE    401.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =    5.31
 RAINFALL INTENSITY(INCH/HR) =   6.85
 TOTAL STREAM AREA(ACRES) =     0.63
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.76

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 4A.1                                                    |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
 FLOW PROCESS FROM NODE     10.00 TO NODE     11.00 IS CODE =  21
----------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    60.00
  UPSTREAM ELEVATION(FEET) =   1364.50
  DOWNSTREAM ELEVATION(FEET) =   1363.60
  ELEVATION DIFFERENCE(FEET) =      0.90
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.167
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.02   TOTAL RUNOFF(CFS) =      0.12

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 4A.2                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     12.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
==============================================================================
  REPRESENTATIVE SLOPE =  0.0050
  CHANNEL LENGTH THRU SUBAREA(FEET) =   168.00
  "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.100
  PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   0.50
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.074
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      1.52
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.49
  AVERAGE FLOW DEPTH(FEET) =   0.21   FLOOD WIDTH(FEET) =   13.28
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.88   Tc(MIN.) =    5.04
  SUBAREA AREA(ACRES) =    0.47       SUBAREA RUNOFF(CFS) =    2.79
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.840
  TOTAL AREA(ACRES) =        0.5         PEAK FLOW RATE(CFS) =       2.91

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.26   FLOOD WIDTH(FEET) =   17.85
  FLOW VELOCITY(FEET/SEC.) =   1.68   DEPTH*VELOCITY(FT*FT/SEC) =   0.44
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     12.00 =     228.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE    401.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  REPRESENTATIVE SLOPE =  0.0120
  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.) =   5.57
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.91
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =    5.07
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE    401.00 =     236.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    401.00 TO NODE    401.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
```

```
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    5.07
  RAINFALL INTENSITY(INCH/HR) =   7.05
  TOTAL STREAM AREA(ACRES) =     0.49
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.91

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        3.76     5.31        6.846          0.63
      2        2.91     5.07        7.052          0.49

  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        6.57     5.07       7.052
      2        6.59     5.31       6.846

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       6.59   Tc(MIN.) =    5.31
  TOTAL AREA(ACRES) =        1.1
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE    401.00 =     436.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    401.00 TO NODE    404.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0050
  FLOW LENGTH(FEET) =    89.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.86
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.59
  PIPE TRAVEL TIME(MIN.) =   0.31    Tc(MIN.) =    5.61
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE    404.00 =     525.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    404.00 TO NODE    404.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 5A                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     14.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    47.00
  UPSTREAM ELEVATION(FEET) =   1364.30
  DOWNSTREAM ELEVATION(FEET) =   1363.00
  ELEVATION DIFFERENCE(FEET) =      1.30
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.286
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.18
  TOTAL AREA(ACRES) =      0.03   TOTAL RUNOFF(CFS) =      0.18
```

```
****************************************************************************
 FLOW PROCESS FROM NODE     14.00 TO NODE    402.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0050
 FLOW LENGTH(FEET) =    60.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN   6.0 INCH PIPE IS   2.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   2.05
 ESTIMATED PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.18
 PIPE TRAVEL TIME(MIN.) =   0.49    Tc(MIN.) =    2.77
 LONGEST FLOWPATH FROM NODE     13.00 TO NODE    402.00 =     107.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    402.00 TO NODE    402.00 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.) =    2.77
 RAINFALL INTENSITY(INCH/HR) =   7.11
 TOTAL STREAM AREA(ACRES) =     0.03
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.18

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 6A                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
 FLOW PROCESS FROM NODE     15.00 TO NODE    402.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  96
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    64.00
 UPSTREAM ELEVATION(FEET) =   1364.50
 DOWNSTREAM ELEVATION(FEET) =   1363.50
 ELEVATION DIFFERENCE(FEET) =      1.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.227
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.72
 TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.72

****************************************************************************
 FLOW PROCESS FROM NODE    402.00 TO NODE    402.00 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.) =    3.23
 RAINFALL INTENSITY(INCH/HR) =   7.11
 TOTAL STREAM AREA(ACRES) =     0.12
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.72

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        0.18     2.77        7.114          0.03
     2        0.72     3.23        7.114          0.12

 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        0.80     2.77       7.114
      2        0.90     3.23       7.114

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       0.90   Tc(MIN.) =    3.23
  TOTAL AREA(ACRES) =        0.1
  LONGEST FLOWPATH FROM NODE     13.00 TO NODE    402.00 =     107.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    402.00 TO NODE    403.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0220
  FLOW LENGTH(FEET) =    71.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   3.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.23
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.90
  PIPE TRAVEL TIME(MIN.) =   0.23    Tc(MIN.) =    3.45
  LONGEST FLOWPATH FROM NODE     13.00 TO NODE    403.00 =     178.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    403.00 TO NODE    403.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 7A.1                                                    |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     17.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    60.00
  UPSTREAM ELEVATION(FEET) =   1364.50
  DOWNSTREAM ELEVATION(FEET) =   1363.30
  ELEVATION DIFFERENCE(FEET) =      1.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.877
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.24
  TOTAL AREA(ACRES) =      0.04   TOTAL RUNOFF(CFS) =      0.24

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 7A.2                                                    |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     17.00 TO NODE     18.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0120
  CHANNEL LENGTH THRU SUBAREA(FEET) =    83.00
```

```
  "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.100
  PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   0.50
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      1.67
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.21
  AVERAGE FLOW DEPTH(FEET) =   0.19   FLOOD WIDTH(FEET) =   11.15
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.63   Tc(MIN.) =    3.50
  SUBAREA AREA(ACRES) =    0.48       SUBAREA RUNOFF(CFS) =    2.87
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.840
  TOTAL AREA(ACRES) =        0.5         PEAK FLOW RATE(CFS) =       3.11

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.23   FLOOD WIDTH(FEET) =   15.11
  FLOW VELOCITY(FEET/SEC.) =   2.43   DEPTH*VELOCITY(FT*FT/SEC) =   0.56
  LONGEST FLOWPATH FROM NODE     16.00 TO NODE     18.00 =     143.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     18.00 TO NODE    403.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0050
  FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.09
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.11
  PIPE TRAVEL TIME(MIN.) =   0.31    Tc(MIN.) =    3.81
  LONGEST FLOWPATH FROM NODE     16.00 TO NODE    403.00 =     218.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    403.00 TO NODE    403.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
      1        3.11     3.81       7.114        0.52
  LONGEST FLOWPATH FROM NODE     16.00 TO NODE    403.00 =     218.00 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
      1        0.90     3.45       7.114        0.15
  LONGEST FLOWPATH FROM NODE     13.00 TO NODE    403.00 =     178.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)      (MIN.)   (INCH/HOUR)
      1       3.71       3.45        7.114
      2       4.00       3.81        7.114

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       4.00   Tc(MIN.) =    3.81
  TOTAL AREA(ACRES) =        0.7

****************************************************************************
  FLOW PROCESS FROM NODE    403.00 TO NODE    403.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    403.00 TO NODE    403.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0600
  FLOW LENGTH(FEET) =    13.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   7.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.74
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.00
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =    3.83
  LONGEST FLOWPATH FROM NODE     16.00 TO NODE    403.00 =     231.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    404.00 TO NODE    404.00 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        4.00     3.83       7.114        0.67
  LONGEST FLOWPATH FROM NODE     16.00 TO NODE    404.00 =     231.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
      1        6.59     5.61       6.603        1.12
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE    404.00 =     525.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1       8.50       3.83        7.114
      2      10.31       5.61        6.603

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      10.31   Tc(MIN.) =    5.61
  TOTAL AREA(ACRES) =        1.8

****************************************************************************
  FLOW PROCESS FROM NODE    404.00 TO NODE    404.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 8A                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     19.00 TO NODE     20.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .6900
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  91
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    81.00
  UPSTREAM ELEVATION(FEET) =   1363.70
  DOWNSTREAM ELEVATION(FEET) =   1358.10
  ELEVATION DIFFERENCE(FEET) =      5.60
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.487
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.39
```

```
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.39

+-------------------------------------------------------------------------+
| DRAINAGE SUBAREA 9A.1                                                   |
|                                                                         |
|                                                                         |
+-------------------------------------------------------------------------+

**************************************************************************
  FLOW PROCESS FROM NODE     21.00 TO NODE     22.00 IS CODE =  21
--------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==========================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1404.00
  DOWNSTREAM ELEVATION(FEET) =   1399.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.422
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.082
  SUBAREA RUNOFF(CFS) =      0.61
  TOTAL AREA(ACRES) =      0.40   TOTAL RUNOFF(CFS) =      0.61

+-------------------------------------------------------------------------+
| DRAINAGE SUBAREA 9A.2                                                   |
|                                                                         |
|                                                                         |
+-------------------------------------------------------------------------+

**************************************************************************
  FLOW PROCESS FROM NODE     22.00 TO NODE     23.00 IS CODE =  51
--------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
==========================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   550.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0550
  CHANNEL BASE(FEET) =   60.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.379
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.47
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.23
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   7.43
  Tc(MIN.) =   15.85
  SUBAREA AREA(ACRES) =     3.57       SUBAREA RUNOFF(CFS) =    3.62
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =        4.0         PEAK FLOW RATE(CFS) =       4.02

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.04   FLOW VELOCITY(FEET/SEC.) =   1.56
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     23.00 =     650.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE     23.00 TO NODE    100.00 IS CODE =  31
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==========================================================================
  REPRESENTATIVE SLOPE =  0.0300
  FLOW LENGTH(FEET) =   278.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.55
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.02
  PIPE TRAVEL TIME(MIN.) =   0.54    Tc(MIN.) =   16.40
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE    100.00 =     928.00 FEET.
```

```
****************************************************************************
 FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 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        4.02    16.40       3.307        3.97
 LONGEST FLOWPATH FROM NODE     21.00 TO NODE    100.00 =     928.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1        0.51     9.10       4.836        0.15
 LONGEST FLOWPATH FROM NODE      1.00 TO NODE    100.00 =     293.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc      INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1       2.75       9.10        4.836
     2       4.38      16.40        3.307

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       4.38   Tc(MIN.) =   16.40
 TOTAL AREA(ACRES) =        4.1

****************************************************************************
 FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0100
 FLOW LENGTH(FEET) =    35.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  24.0 INCH PIPE IS   7.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.36
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       4.38
 PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =   16.50
 LONGEST FLOWPATH FROM NODE     21.00 TO NODE    101.00 =     963.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    101.00 TO NODE    101.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   16.50
 RAINFALL INTENSITY(INCH/HR) =   3.29
 TOTAL STREAM AREA(ACRES) =     4.12
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.38

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 10A.1                                                   |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
 FLOW PROCESS FROM NODE     24.00 TO NODE     25.00 IS CODE =  21
----------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .6900
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  92
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    64.00
  UPSTREAM ELEVATION(FEET) =   1359.00
  DOWNSTREAM ELEVATION(FEET) =   1357.60
  ELEVATION DIFFERENCE(FEET) =      1.40
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.548
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.15
  TOTAL AREA(ACRES) =      0.03   TOTAL RUNOFF(CFS) =      0.15

+------------------------------------------------------------------------------+
| DRAINAGE SUBAREA 10A.2                                                       |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+

********************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE    101.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =    71.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0270
  CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.458
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .6900
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  92
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.35
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.94
  AVERAGE FLOW DEPTH(FEET) =   0.01   TRAVEL TIME(MIN.) =   1.26
  Tc(MIN.) =    5.81
  SUBAREA AREA(ACRES) =     0.09       SUBAREA RUNOFF(CFS) =    0.40
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.690
  TOTAL AREA(ACRES) =        0.1         PEAK FLOW RATE(CFS) =       0.53

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.02   FLOW VELOCITY(FEET/SEC.) =   0.98
  LONGEST FLOWPATH FROM NODE     24.00 TO NODE    101.00 =     135.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    101.00 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.) =    5.81
  RAINFALL INTENSITY(INCH/HR) =   6.46
  TOTAL STREAM AREA(ACRES) =     0.12
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.53

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        4.38    16.50        3.293          4.12
      2        0.53     5.81        6.458          0.12

  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        2.07      5.81       6.458
      2        4.65     16.50       3.293

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       4.65   Tc(MIN.) =   16.50
  TOTAL AREA(ACRES) =        4.2
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE    101.00 =     963.00 FEET.

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1B                                                        |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     31.00 TO NODE     32.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    36.00
  UPSTREAM ELEVATION(FEET) =   1364.30
  DOWNSTREAM ELEVATION(FEET) =   1363.90
  ELEVATION DIFFERENCE(FEET) =      0.40
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.711
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.30
  TOTAL AREA(ACRES) =      0.05   TOTAL RUNOFF(CFS) =      0.30

****************************************************************************
  FLOW PROCESS FROM NODE     32.00 TO NODE     33.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    94.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   6.0 INCH PIPE IS   3.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.96
  GIVEN PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.30
  PIPE TRAVEL TIME(MIN.) =   0.53    Tc(MIN.) =    3.24
  LONGEST FLOWPATH FROM NODE     31.00 TO NODE     33.00 =     130.00 FEET.

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2B                                                        |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8400
  SUBAREA AREA(ACRES) =    0.05   SUBAREA RUNOFF(CFS) =    0.30
  TOTAL AREA(ACRES) =        0.1   TOTAL RUNOFF(CFS) =       0.60
  TC(MIN.) =    3.24

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE    200.00 IS CODE =  41
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0640
  FLOW LENGTH(FEET) =    13.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   6.0 INCH PIPE IS   2.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.09
  GIVEN PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.60
  PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =    3.27
  LONGEST FLOWPATH FROM NODE     31.00 TO NODE    200.00 =     143.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    200.00 TO NODE     34.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0180
  FLOW LENGTH(FEET) =    99.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   6.0 INCH PIPE IS   3.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.36
  GIVEN PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.60
  PIPE TRAVEL TIME(MIN.) =   0.38    Tc(MIN.) =    3.65
  LONGEST FLOWPATH FROM NODE     31.00 TO NODE     34.00 =     242.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     34.00 TO NODE     36.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =    12.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0170
  CHANNEL BASE(FEET) =    6.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
  CHANNEL FLOW THRU SUBAREA(CFS) =       0.60
  FLOW VELOCITY(FEET/SEC.) =   1.77   FLOW DEPTH(FEET) =   0.06
  TRAVEL TIME(MIN.) =   0.11   Tc(MIN.) =    3.76
  LONGEST FLOWPATH FROM NODE     31.00 TO NODE     36.00 =     254.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     36.00 TO NODE     36.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    3.76
  RAINFALL INTENSITY(INCH/HR) =   7.11
  TOTAL STREAM AREA(ACRES) =     0.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.60

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 3B                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     35.00 TO NODE     36.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    89.00
  UPSTREAM ELEVATION(FEET) =   1364.10
```

```
  DOWNSTREAM ELEVATION(FEET) =   1358.00
  ELEVATION DIFFERENCE(FEET) =      6.10
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.324
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.24
  TOTAL AREA(ACRES) =      0.04   TOTAL RUNOFF(CFS) =      0.24

****************************************************************************
  FLOW PROCESS FROM NODE     36.00 TO NODE     36.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    2.32
  RAINFALL INTENSITY(INCH/HR) =   7.11
  TOTAL STREAM AREA(ACRES) =     0.04
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.24

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        0.60     3.76        7.114          0.10
      2        0.24     2.32        7.114          0.04

  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        0.61     2.32       7.114
      2        0.84     3.76       7.114

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       0.84   Tc(MIN.) =    3.76
  TOTAL AREA(ACRES) =        0.1
  LONGEST FLOWPATH FROM NODE     31.00 TO NODE     36.00 =     254.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     36.00 TO NODE    201.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =     1.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   3.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.84
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.84
  PIPE TRAVEL TIME(MIN.) =   0.00    Tc(MIN.) =    3.77
  LONGEST FLOWPATH FROM NODE     31.00 TO NODE    201.00 =     255.00 FEET.

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 4B                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     37.00 TO NODE     38.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    49.00
```

```
  UPSTREAM ELEVATION(FEET) =   1363.00
  DOWNSTREAM ELEVATION(FEET) =   1362.20
  ELEVATION DIFFERENCE(FEET) =      0.80
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.782
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.66
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.66

****************************************************************************
  FLOW PROCESS FROM NODE     38.00 TO NODE    202.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    64.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   3.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.52
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.66
  PIPE TRAVEL TIME(MIN.) =   0.30    Tc(MIN.) =    3.09
  LONGEST FLOWPATH FROM NODE     37.00 TO NODE    202.00 =     113.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    202.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    3.09
  RAINFALL INTENSITY(INCH/HR) =   7.11
  TOTAL STREAM AREA(ACRES) =     0.11
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.66

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 5B                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     39.00 TO NODE     40.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    54.00
  UPSTREAM ELEVATION(FEET) =   1364.30
  DOWNSTREAM ELEVATION(FEET) =   1362.00
  ELEVATION DIFFERENCE(FEET) =      2.30
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.122
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.36
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.36

****************************************************************************
  FLOW PROCESS FROM NODE     40.00 TO NODE    202.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0380
  FLOW LENGTH(FEET) =    15.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   1.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.70
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
```

```
  PIPE-FLOW(CFS) =       0.36
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    2.17
  LONGEST FLOWPATH FROM NODE     39.00 TO NODE    202.00 =      69.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    202.00 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.) =    2.17
  RAINFALL INTENSITY(INCH/HR) =   7.11
  TOTAL STREAM AREA(ACRES) =     0.06
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.36

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        0.66     3.09        7.114          0.11
      2        0.36     2.17        7.114          0.06

  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        0.82     2.17       7.114
      2        1.02     3.09       7.114

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       1.02   Tc(MIN.) =    3.09
  TOTAL AREA(ACRES) =        0.2
  LONGEST FLOWPATH FROM NODE     37.00 TO NODE    202.00 =     113.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    203.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.1100
  FLOW LENGTH(FEET) =    54.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   2.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.40
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.02
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =    3.18
  LONGEST FLOWPATH FROM NODE     37.00 TO NODE    203.00 =     167.00 FEET.

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 6B                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    203.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8400
  SUBAREA AREA(ACRES) =    0.00   SUBAREA RUNOFF(CFS) =    0.03
  TOTAL AREA(ACRES) =        0.2   TOTAL RUNOFF(CFS) =       1.05
```

```
  TC(MIN.) =    3.18

+-------------------------------------------------------------------------+
| DRAINAGE SUBAREA 7B.1                                                   |
|                                                                         |
|                                                                         |
+-------------------------------------------------------------------------+

*************************************************************************
  FLOW PROCESS FROM NODE     42.00 TO NODE     43.00 IS CODE =  21
-------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
=========================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1361.10
  DOWNSTREAM ELEVATION(FEET) =   1358.60
  ELEVATION DIFFERENCE(FEET) =      2.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.863
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.48
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.48

+-------------------------------------------------------------------------+
| DRAINAGE SUBAREA 7B.2                                                   |
|                                                                         |
|                                                                         |
+-------------------------------------------------------------------------+

*************************************************************************
  FLOW PROCESS FROM NODE     43.00 TO NODE     44.00 IS CODE =  51
-------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
=========================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =    36.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0360
  CHANNEL BASE(FEET) =    8.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.01
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   0.30
  Tc(MIN.) =    3.16
  SUBAREA AREA(ACRES) =     0.02       SUBAREA RUNOFF(CFS) =    0.12
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.840
  TOTAL AREA(ACRES) =        0.1         PEAK FLOW RATE(CFS) =       0.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.04   FLOW VELOCITY(FEET/SEC.) =   2.12
  LONGEST FLOWPATH FROM NODE     42.00 TO NODE     44.00 =     116.00 FEET.

+-------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1C.1                                                   |
|                                                                         |
|                                                                         |
+-------------------------------------------------------------------------+

*************************************************************************
  FLOW PROCESS FROM NODE     51.00 TO NODE     52.00 IS CODE =  21
-------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
=========================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
```

```
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1401.00
  DOWNSTREAM ELEVATION(FEET) =   1397.00
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.072
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.844
  SUBAREA RUNOFF(CFS) =      0.45
  TOTAL AREA(ACRES) =      0.31   TOTAL RUNOFF(CFS) =      0.45

+-------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1C.2                                                   |
|                                                                         |
|                                                                         |
+-------------------------------------------------------------------------+

*************************************************************************
  FLOW PROCESS FROM NODE     52.00 TO NODE     53.00 IS CODE =  51
-------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
=========================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   380.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0710
  CHANNEL BASE(FEET) =   60.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.576
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  79
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       1.80
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.16
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   5.45
  Tc(MIN.) =   14.52
  SUBAREA AREA(ACRES) =     1.80       SUBAREA RUNOFF(CFS) =    2.70
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.402
  TOTAL AREA(ACRES) =        2.1         PEAK FLOW RATE(CFS) =       3.04

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.04   FLOW VELOCITY(FEET/SEC.) =   1.43
  LONGEST FLOWPATH FROM NODE     51.00 TO NODE     53.00 =     480.00 FEET.

+-------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1C.3                                                   |
|                                                                         |
|                                                                         |
+-------------------------------------------------------------------------+

*************************************************************************
  FLOW PROCESS FROM NODE     53.00 TO NODE     54.00 IS CODE =  91
-------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
=========================================================================
  REPRESENTATIVE SLOPE =  0.0260
  CHANNEL LENGTH THRU SUBAREA(FEET) =   385.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.090
  PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   0.50
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.312
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8300
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  92
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      3.72
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.50
  AVERAGE FLOW DEPTH(FEET) =   0.19   FLOOD WIDTH(FEET) =   13.52
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.83   Tc(MIN.) =   16.35
  SUBAREA AREA(ACRES) =    0.50       SUBAREA RUNOFF(CFS) =    1.37
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.484
  TOTAL AREA(ACRES) =        2.6         PEAK FLOW RATE(CFS) =       4.19
```

```
  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.19   FLOOD WIDTH(FEET) =   14.30
  FLOW VELOCITY(FEET/SEC.) =   3.57   DEPTH*VELOCITY(FT*FT/SEC) =   0.69
  LONGEST FLOWPATH FROM NODE     51.00 TO NODE     54.00 =     865.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     54.00 TO NODE     55.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0130
  FLOW LENGTH(FEET) =   166.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.32
  GIVEN PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.19
  PIPE TRAVEL TIME(MIN.) =   0.44    Tc(MIN.) =   16.79
  LONGEST FLOWPATH FROM NODE     51.00 TO NODE     55.00 =    1031.00 FEET.

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2C                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     55.00 TO NODE     55.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.257
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5499
  SUBAREA AREA(ACRES) =    0.59   SUBAREA RUNOFF(CFS) =    1.61
  TOTAL AREA(ACRES) =        3.2   TOTAL RUNOFF(CFS) =       5.73
  TC(MIN.) =   16.79

****************************************************************************
  FLOW PROCESS FROM NODE     55.00 TO NODE     55.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 3C.1                                                    |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     56.00 TO NODE     57.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  ARTIICIAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .8700
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
  UPSTREAM ELEVATION(FEET) =   1370.50
  DOWNSTREAM ELEVATION(FEET) =   1365.90
  ELEVATION DIFFERENCE(FEET) =      4.60
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.280
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.25
  TOTAL AREA(ACRES) =      0.04   TOTAL RUNOFF(CFS) =      0.25
```

```
+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 3C.2                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     58.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  CHANNEL LENGTH THRU SUBAREA(FEET) =   297.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.090
  PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.20000
  MAXIMUM DEPTH(FEET) =   0.50
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      1.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.73
  AVERAGE FLOW DEPTH(FEET) =   0.13   FLOOD WIDTH(FEET) =    5.32
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.81   Tc(MIN.) =    4.09
  SUBAREA AREA(ACRES) =    0.32       SUBAREA RUNOFF(CFS) =    1.91
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.843
  TOTAL AREA(ACRES) =        0.4         PEAK FLOW RATE(CFS) =       2.16

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.17   FLOOD WIDTH(FEET) =    5.68
  FLOW VELOCITY(FEET/SEC.) =   3.39   DEPTH*VELOCITY(FT*FT/SEC) =   0.57
  LONGEST FLOWPATH FROM NODE     56.00 TO NODE     58.00 =     387.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     58.00 TO NODE    300.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0110
  FLOW LENGTH(FEET) =    34.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.02
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.16
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =    4.20
  LONGEST FLOWPATH FROM NODE     56.00 TO NODE    300.00 =     421.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    300.00 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.) =    4.20
  RAINFALL INTENSITY(INCH/HR) =   7.11
  TOTAL STREAM AREA(ACRES) =     0.36
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.16

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 4C.1                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     59.00 TO NODE     60.00 IS CODE =  21
----------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  ARTIICIAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .8700
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    60.00
  UPSTREAM ELEVATION(FEET) =   1370.50
  DOWNSTREAM ELEVATION(FEET) =   1365.40
  ELEVATION DIFFERENCE(FEET) =      5.10
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.571
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.19
  TOTAL AREA(ACRES) =      0.03   TOTAL RUNOFF(CFS) =      0.19

+------------------------------------------------------------------------------+
| DRAINAGE SUBAREA 4C.2                                                        |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+

********************************************************************************
  FLOW PROCESS FROM NODE     60.00 TO NODE     61.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =    70.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0900
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   0.330
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  ARTIICIAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .8700
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.22
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.60
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   0.45
  Tc(MIN.) =    2.02
  SUBAREA AREA(ACRES) =     0.01       SUBAREA RUNOFF(CFS) =    0.06
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.870
  TOTAL AREA(ACRES) =        0.0         PEAK FLOW RATE(CFS) =       0.25

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.03   FLOW VELOCITY(FEET/SEC.) =   2.97
  LONGEST FLOWPATH FROM NODE     59.00 TO NODE     61.00 =     130.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE     61.00 TO NODE    300.00 IS CODE =  41
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
================================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    27.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   2.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.65
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.25
  PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =    2.19
  LONGEST FLOWPATH FROM NODE     59.00 TO NODE    300.00 =     157.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    300.00 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.) =    2.19
  RAINFALL INTENSITY(INCH/HR) =   7.11
  TOTAL STREAM AREA(ACRES) =     0.04
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.25

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        2.16     4.20        7.114          0.36
      2        0.25     2.19        7.114          0.04

  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        1.37     2.19       7.114
      2        2.41     4.20       7.114

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       2.41   Tc(MIN.) =    4.20
  TOTAL AREA(ACRES) =        0.4
  LONGEST FLOWPATH FROM NODE     56.00 TO NODE    300.00 =     421.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE     55.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0220
  FLOW LENGTH(FEET) =    64.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   5.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.63
  GIVEN PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.41
  PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =    4.36
  LONGEST FLOWPATH FROM NODE     56.00 TO NODE     55.00 =     485.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     55.00 TO NODE     55.00 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        2.41     4.36       7.114        0.40
  LONGEST FLOWPATH FROM NODE     56.00 TO NODE     55.00 =     485.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY     AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
      1        5.73    16.79       3.257        3.20
  LONGEST FLOWPATH FROM NODE     51.00 TO NODE     55.00 =    1031.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1       3.90       4.36        7.114
      2       6.83      16.79        3.257

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       6.83   Tc(MIN.) =   16.79
  TOTAL AREA(ACRES) =        3.6

****************************************************************************
  FLOW PROCESS FROM NODE     55.00 TO NODE     55.00 IS CODE =  12
----------------------------------------------------------------------------
```

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

********************************************************************************
  FLOW PROCESS FROM NODE     55.00 TO NODE     62.00 IS CODE =  41
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
================================================================================
  REPRESENTATIVE SLOPE =  0.0150
  FLOW LENGTH(FEET) =   173.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.54
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.83
  PIPE TRAVEL TIME(MIN.) =   0.38    Tc(MIN.) =   17.17
  LONGEST FLOWPATH FROM NODE     51.00 TO NODE     62.00 =    1204.00 FEET.

+------------------------------------------------------------------------------+
| DRAINAGE SUBAREA 5C                                                          |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+

********************************************************************************
  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) =  3.210
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6108
  SUBAREA AREA(ACRES) =    0.44   SUBAREA RUNOFF(CFS) =    1.19
  TOTAL AREA(ACRES) =        4.0   TOTAL RUNOFF(CFS) =       7.92
  TC(MIN.) =   17.17

********************************************************************************
  FLOW PROCESS FROM NODE     62.00 TO NODE     66.00 IS CODE =  41
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
================================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    84.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  24.0 INCH PIPE IS   9.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.70
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.92
  PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =   17.38
  LONGEST FLOWPATH FROM NODE     51.00 TO NODE     66.00 =    1288.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE     66.00 TO NODE     66.00 IS CODE =   1
--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   17.38
  RAINFALL INTENSITY(INCH/HR) =   3.18
  TOTAL STREAM AREA(ACRES) =     4.04
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.92

+------------------------------------------------------------------------------+
| DRAINAGE SUBAREA 6C.1                                                        |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     63.00 TO NODE     64.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    53.00
  UPSTREAM ELEVATION(FEET) =   1359.30
  DOWNSTREAM ELEVATION(FEET) =   1358.70
  ELEVATION DIFFERENCE(FEET) =      0.60
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.269
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.66
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.66

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 6C.2                                                    |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     64.00 TO NODE     65.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0110
  CHANNEL LENGTH THRU SUBAREA(FEET) =   188.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.090
  PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   0.50
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      1.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.15
  AVERAGE FLOW DEPTH(FEET) =   0.16   FLOOD WIDTH(FEET) =   11.33
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.46   Tc(MIN.) =    4.73
  SUBAREA AREA(ACRES) =    0.35       SUBAREA RUNOFF(CFS) =    2.09
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.840
  TOTAL AREA(ACRES) =        0.5         PEAK FLOW RATE(CFS) =       2.75

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.19   FLOOD WIDTH(FEET) =   14.30
  FLOW VELOCITY(FEET/SEC.) =   2.35   DEPTH*VELOCITY(FT*FT/SEC) =   0.45
  LONGEST FLOWPATH FROM NODE     63.00 TO NODE     65.00 =     241.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     65.00 TO NODE     66.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0150
  FLOW LENGTH(FEET) =   105.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.00
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.75
  PIPE TRAVEL TIME(MIN.) =   0.29    Tc(MIN.) =    5.02
  LONGEST FLOWPATH FROM NODE     63.00 TO NODE     66.00 =     346.00 FEET.

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 7C                                                      |
|                                                                          |
```

```
|                                                                              |
+------------------------------------------------------------------------------+

******************************************************************************
 FLOW PROCESS FROM NODE     66.00 TO NODE     66.00 IS CODE =  81
------------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.098
 LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  96
 AREA-AVERAGE RUNOFF COEFFICIENT = 0.8400
 SUBAREA AREA(ACRES) =    0.24   SUBAREA RUNOFF(CFS) =    1.43
 TOTAL AREA(ACRES) =        0.7   TOTAL RUNOFF(CFS) =       4.17
 TC(MIN.) =    5.02

******************************************************************************
 FLOW PROCESS FROM NODE     66.00 TO NODE     66.00 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.) =    5.02
 RAINFALL INTENSITY(INCH/HR) =   7.10
 TOTAL STREAM AREA(ACRES) =     0.70
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.17

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        7.92    17.38        3.185          4.04
     2        4.17     5.02        7.098          0.70

 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        6.46     5.02       7.098
     2        9.79    17.38       3.185

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       9.79   Tc(MIN.) =   17.38
 TOTAL AREA(ACRES) =        4.7
 LONGEST FLOWPATH FROM NODE     51.00 TO NODE     66.00 =    1288.00 FEET.

******************************************************************************
 FLOW PROCESS FROM NODE     66.00 TO NODE     67.00 IS CODE =  41
------------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==============================================================================
 REPRESENTATIVE SLOPE =  0.0100
 FLOW LENGTH(FEET) =    76.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  10.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.08
 GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       9.79
 PIPE TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =   17.56
 LONGEST FLOWPATH FROM NODE     51.00 TO NODE     67.00 =    1364.00 FEET.

+------------------------------------------------------------------------------+
| DRAINAGE SUBAREA 8C                                                          |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     67.00 TO NODE     67.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.164
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8300
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  92
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6567
  SUBAREA AREA(ACRES) =    0.33   SUBAREA RUNOFF(CFS) =    0.87
  TOTAL AREA(ACRES) =        5.1   TOTAL RUNOFF(CFS) =      10.53
  TC(MIN.) =   17.56

****************************************************************************
  FLOW PROCESS FROM NODE     67.00 TO NODE    301.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0130
  FLOW LENGTH(FEET) =     6.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  10.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.96
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.53
  PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =   17.57
  LONGEST FLOWPATH FROM NODE     51.00 TO NODE    301.00 =    1370.00 FEET.

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 9C.1                                                    |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     68.00 TO NODE     69.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8300
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  92
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    60.00
  UPSTREAM ELEVATION(FEET) =   1356.20
  DOWNSTREAM ELEVATION(FEET) =   1355.00
  ELEVATION DIFFERENCE(FEET) =      1.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.988
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.12
  TOTAL AREA(ACRES) =      0.02   TOTAL RUNOFF(CFS) =      0.12

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 9C.2                                                    |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     69.00 TO NODE     70.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   129.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0080
  CHANNEL BASE(FEET) =    1.50   "Z" FACTOR =  13.090
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
```

```
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8300
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  92
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.44
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.49
  AVERAGE FLOW DEPTH(FEET) =   0.10   TRAVEL TIME(MIN.) =   1.44
  Tc(MIN.) =    4.43
  SUBAREA AREA(ACRES) =     0.11       SUBAREA RUNOFF(CFS) =    0.65
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.830
  TOTAL AREA(ACRES) =        0.1         PEAK FLOW RATE(CFS) =       0.77

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.13   FLOW VELOCITY(FEET/SEC.) =   1.75
  LONGEST FLOWPATH FROM NODE     68.00 TO NODE     70.00 =     189.00 FEET.

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1D.1                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     81.00 TO NODE     82.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1452.00
  DOWNSTREAM ELEVATION(FEET) =   1429.00
  ELEVATION DIFFERENCE(FEET) =     23.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.684
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.899
  SUBAREA RUNOFF(CFS) =      1.01
  TOTAL AREA(ACRES) =      0.57   TOTAL RUNOFF(CFS) =      1.01

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1D.2                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     82.00 TO NODE     83.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   651.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0940
  CHANNEL BASE(FEET) =  100.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.508
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .2700
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  45
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.63
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.31
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   8.27
  Tc(MIN.) =   14.96
  SUBAREA AREA(ACRES) =     5.18       SUBAREA RUNOFF(CFS) =    4.91
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.273
  TOTAL AREA(ACRES) =        5.8         PEAK FLOW RATE(CFS) =       5.51

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.04   FLOW VELOCITY(FEET/SEC.) =   1.56
  LONGEST FLOWPATH FROM NODE     81.00 TO NODE     83.00 =     751.00 FEET.
```

```
+-------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1D.3                                                   |
|                                                                         |
|                                                                         |
+-------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     83.00 TO NODE     84.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0560
  CHANNEL LENGTH THRU SUBAREA(FEET) =   181.00
  "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.800
  PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.20000
  MAXIMUM DEPTH(FEET) =   1.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.470
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      5.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.71
  AVERAGE FLOW DEPTH(FEET) =   0.80   FLOOD WIDTH(FEET) =    3.00
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.26   Tc(MIN.) =   15.22
  SUBAREA AREA(ACRES) =    0.10       SUBAREA RUNOFF(CFS) =    0.17
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.277
  TOTAL AREA(ACRES) =        5.8         PEAK FLOW RATE(CFS) =       5.61

         NOTE:TRAVEL TIME ESTIMATES BASED ON NORMAL DEPTH
         IN A FLOWING-FULL GUTTER(NORMAL DEPTH = GUTTER HIKE)


  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.80   FLOOD WIDTH(FEET) =    3.00
  FLOW VELOCITY(FEET/SEC.) =  11.71   DEPTH*VELOCITY(FT*FT/SEC) =   9.37
  LONGEST FLOWPATH FROM NODE     81.00 TO NODE     84.00 =     932.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     84.00 TO NODE     86.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =    41.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0120
  CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   0.330
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
  CHANNEL FLOW THRU SUBAREA(CFS) =       5.61
  FLOW VELOCITY(FEET/SEC.) =   4.53   FLOW DEPTH(FEET) =   0.30
  TRAVEL TIME(MIN.) =   0.15   Tc(MIN.) =   15.37
  LONGEST FLOWPATH FROM NODE     81.00 TO NODE     86.00 =     973.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     86.00 TO NODE     86.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.37
  RAINFALL INTENSITY(INCH/HR) =   3.45
  TOTAL STREAM AREA(ACRES) =     5.85
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.61

+-------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2D                                                     |
|                                                                         |
|                                                                         |
+-------------------------------------------------------------------------+
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     85.00 TO NODE     86.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    22.00
  UPSTREAM ELEVATION(FEET) =   1358.00
  DOWNSTREAM ELEVATION(FEET) =   1357.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.078
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.114
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.26
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.26

****************************************************************************
  FLOW PROCESS FROM NODE     86.00 TO NODE     86.00 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.) =    4.08
  RAINFALL INTENSITY(INCH/HR) =   7.11
  TOTAL STREAM AREA(ACRES) =     0.12
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.26

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        5.61    15.37        3.448          5.85
      2        0.26     4.08        7.114          0.12

  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        1.75     4.08       7.114
      2        5.74    15.37       3.448

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       5.74   Tc(MIN.) =   15.37
  TOTAL AREA(ACRES) =        6.0
  LONGEST FLOWPATH FROM NODE     81.00 TO NODE     86.00 =     973.00 FEET.

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1E                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     91.00 TO NODE     92.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2000
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  63
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    86.00
  UPSTREAM ELEVATION(FEET) =   1358.00
  DOWNSTREAM ELEVATION(FEET) =   1351.10
  ELEVATION DIFFERENCE(FEET) =      6.90
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.505
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.474
```

```
  SUBAREA RUNOFF(CFS) =      0.13
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.13
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        0.1  TC(MIN.) =      7.50
  PEAK FLOW RATE(CFS)   =       0.13
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2015 Advanced Engineering Software (aes)
              Ver. 22.0 Release Date: 07/01/2015  License ID 1510

                            Analysis prepared by:

                            DRC Engineering, Inc.
                      160 South Old Springs Road, Suite 210
                             Anaheim Hills, CA 92808
                                  714-685-6860

 ************************* DESCRIPTION OF STUDY *************************
* 19-132 GS VALLEY EXPANSION (28435 LIZARD ROCKS ROAD)                    *
* PROPOSED CONDITION                                                      *
* 25-YEAR STORM EVENT                                                     *
 ************************************************************************

  FILE NAME: 19132P25.DAT
  TIME/DATE OF STUDY: 11:12 05/19/2021
------------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) =  25.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   3.000
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)   (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   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.*

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1A.1                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

******************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .6900
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  92
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    69.00
  UPSTREAM ELEVATION(FEET) =   1364.00
  DOWNSTREAM ELEVATION(FEET) =   1362.10
  ELEVATION DIFFERENCE(FEET) =      1.90
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.374
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.16
```

```
  TOTAL AREA(ACRES) =      0.03   TOTAL RUNOFF(CFS) =      0.16

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1A.2                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   162.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0390
  CHANNEL BASE(FEET) =   45.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.50
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.727
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .6900
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  92
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.70
  AVERAGE FLOW DEPTH(FEET) =   0.01   TRAVEL TIME(MIN.) =   3.87
  Tc(MIN.) =    8.24
  SUBAREA AREA(ACRES) =     0.12       SUBAREA RUNOFF(CFS) =    0.47
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.690
  TOTAL AREA(ACRES) =        0.1         PEAK FLOW RATE(CFS) =       0.59

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.02   FLOW VELOCITY(FEET/SEC.) =   0.73
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     231.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE    100.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0120
  FLOW LENGTH(FEET) =    62.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS   2.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.17
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.59
  PIPE TRAVEL TIME(MIN.) =   0.33    Tc(MIN.) =    8.57
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE    100.00 =     293.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2A.1                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE      4.00 TO NODE      5.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    49.00
  UPSTREAM ELEVATION(FEET) =   1363.70
```

```
  DOWNSTREAM ELEVATION(FEET) =   1363.20
  ELEVATION DIFFERENCE(FEET) =      0.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.254
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.20
  TOTAL AREA(ACRES) =      0.03   TOTAL RUNOFF(CFS) =      0.20

+-------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2A.2                                                   |
|                                                                         |
|                                                                         |
+-------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE      5.00 TO NODE      6.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0060
  CHANNEL LENGTH THRU SUBAREA(FEET) =    33.00
  "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.100
  PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   0.50
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      0.46
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.40
  AVERAGE FLOW DEPTH(FEET) =   0.14   FLOOD WIDTH(FEET) =    6.28
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.39   Tc(MIN.) =    3.65
  SUBAREA AREA(ACRES) =    0.08       SUBAREA RUNOFF(CFS) =    0.53
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.840
  TOTAL AREA(ACRES) =        0.1         PEAK FLOW RATE(CFS) =       0.73

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.17   FLOOD WIDTH(FEET) =    8.56
  FLOW VELOCITY(FEET/SEC.) =   1.46   DEPTH*VELOCITY(FT*FT/SEC) =   0.24
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE      6.00 =      82.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      6.00 TO NODE    400.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0050
  FLOW LENGTH(FEET) =   127.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   5.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.85
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.73
  PIPE TRAVEL TIME(MIN.) =   0.74    Tc(MIN.) =    4.39
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE    400.00 =     209.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    400.00 TO NODE    400.00 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.) =    4.39
  RAINFALL INTENSITY(INCH/HR) =   7.90
  TOTAL STREAM AREA(ACRES) =     0.11
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.73

+-------------------------------------------------------------------------+
```

```
| DRAINAGE SUBAREA 3A.1                                                          |
|                                                                                |
|                                                                                |
+--------------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE      7.00 TO NODE      8.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    60.00
  UPSTREAM ELEVATION(FEET) =   1364.50
  DOWNSTREAM ELEVATION(FEET) =   1363.30
  ELEVATION DIFFERENCE(FEET) =      1.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.877
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.53
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.53

+--------------------------------------------------------------------------------+
| DRAINAGE SUBAREA 3A.2                                                          |
|                                                                                |
|                                                                                |
+--------------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE      8.00 TO NODE      9.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0060
  CHANNEL LENGTH THRU SUBAREA(FEET) =    90.00
  "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.100
  PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   0.50
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      1.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.68
  AVERAGE FLOW DEPTH(FEET) =   0.23   FLOOD WIDTH(FEET) =   14.50
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.89   Tc(MIN.) =    3.77
  SUBAREA AREA(ACRES) =    0.44       SUBAREA RUNOFF(CFS) =    2.92
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.840
  TOTAL AREA(ACRES) =        0.5         PEAK FLOW RATE(CFS) =       3.45

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.26   FLOOD WIDTH(FEET) =   18.46
  FLOW VELOCITY(FEET/SEC.) =   1.88   DEPTH*VELOCITY(FT*FT/SEC) =   0.50
  LONGEST FLOWPATH FROM NODE      7.00 TO NODE      9.00 =     150.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      9.00 TO NODE    400.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0170
  FLOW LENGTH(FEET) =     6.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.61
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.45
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =    3.79
```

```
 LONGEST FLOWPATH FROM NODE      7.00 TO NODE    400.00 =     156.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    400.00 TO NODE    400.00 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.) =    3.79
 RAINFALL INTENSITY(INCH/HR) =   7.90
 TOTAL STREAM AREA(ACRES) =     0.52
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.45

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        0.73     4.39        7.904          0.11
     2        3.45     3.79        7.904          0.52

 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        4.08     3.79       7.904
     2        4.18     4.39       7.904

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       4.18   Tc(MIN.) =    4.39
 TOTAL AREA(ACRES) =        0.6
 LONGEST FLOWPATH FROM NODE      4.00 TO NODE    400.00 =     209.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    400.00 TO NODE    401.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0050
 FLOW LENGTH(FEET) =   227.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  15.0 INCH PIPE IS  11.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.32
 ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       4.18
 PIPE TRAVEL TIME(MIN.) =   0.87    Tc(MIN.) =    5.27
 LONGEST FLOWPATH FROM NODE      4.00 TO NODE    401.00 =     436.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    401.00 TO NODE    401.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =    5.27
 RAINFALL INTENSITY(INCH/HR) =   7.65
 TOTAL STREAM AREA(ACRES) =     0.63
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.18

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 4A.1                                                    |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
 FLOW PROCESS FROM NODE     10.00 TO NODE     11.00 IS CODE =  21
----------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    60.00
  UPSTREAM ELEVATION(FEET) =   1364.50
  DOWNSTREAM ELEVATION(FEET) =   1363.60
  ELEVATION DIFFERENCE(FEET) =      0.90
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.167
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.13
  TOTAL AREA(ACRES) =      0.02   TOTAL RUNOFF(CFS) =      0.13

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 4A.2                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     12.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
==============================================================================
  REPRESENTATIVE SLOPE =  0.0050
  CHANNEL LENGTH THRU SUBAREA(FEET) =   168.00
  "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.100
  PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   0.50
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      1.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.54
  AVERAGE FLOW DEPTH(FEET) =   0.22   FLOOD WIDTH(FEET) =   13.89
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.82   Tc(MIN.) =    4.99
  SUBAREA AREA(ACRES) =    0.47       SUBAREA RUNOFF(CFS) =    3.12
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.840
  TOTAL AREA(ACRES) =        0.5         PEAK FLOW RATE(CFS) =       3.25

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.27   FLOOD WIDTH(FEET) =   18.77
  FLOW VELOCITY(FEET/SEC.) =   1.72   DEPTH*VELOCITY(FT*FT/SEC) =   0.46
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     12.00 =     228.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE    401.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  REPRESENTATIVE SLOPE =  0.0120
  FLOW LENGTH(FEET) =     8.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   8.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.69
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.25
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =    5.01
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE    401.00 =     236.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    401.00 TO NODE    401.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
```

```
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    5.01
  RAINFALL INTENSITY(INCH/HR) =   7.89
  TOTAL STREAM AREA(ACRES) =     0.49
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.25

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        4.18     5.27        7.645          0.63
      2        3.25     5.01        7.895          0.49

  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        7.30     5.01       7.895
      2        7.33     5.27       7.645

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       7.33   Tc(MIN.) =    5.27
  TOTAL AREA(ACRES) =        1.1
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE    401.00 =     436.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    401.00 TO NODE    404.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0050
  FLOW LENGTH(FEET) =    89.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  14.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.92
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.33
  PIPE TRAVEL TIME(MIN.) =   0.30    Tc(MIN.) =    5.57
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE    404.00 =     525.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    404.00 TO NODE    404.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 5A                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     14.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    47.00
  UPSTREAM ELEVATION(FEET) =   1364.30
  DOWNSTREAM ELEVATION(FEET) =   1363.00
  ELEVATION DIFFERENCE(FEET) =      1.30
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.286
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.20
  TOTAL AREA(ACRES) =      0.03   TOTAL RUNOFF(CFS) =      0.20
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     14.00 TO NODE    402.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0050
  FLOW LENGTH(FEET) =    60.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   6.0 INCH PIPE IS   3.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.07
  ESTIMATED PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.20
  PIPE TRAVEL TIME(MIN.) =   0.48    Tc(MIN.) =    2.77
  LONGEST FLOWPATH FROM NODE     13.00 TO NODE    402.00 =     107.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    402.00 TO NODE    402.00 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.) =    2.77
  RAINFALL INTENSITY(INCH/HR) =   7.90
  TOTAL STREAM AREA(ACRES) =     0.03
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.20

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 6A                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     15.00 TO NODE    402.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    64.00
  UPSTREAM ELEVATION(FEET) =   1364.50
  DOWNSTREAM ELEVATION(FEET) =   1363.50
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.227
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.80
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.80

****************************************************************************
  FLOW PROCESS FROM NODE    402.00 TO NODE    402.00 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.) =    3.23
  RAINFALL INTENSITY(INCH/HR) =   7.90
  TOTAL STREAM AREA(ACRES) =     0.12
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.80

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        0.20     2.77        7.904          0.03
      2        0.80     3.23        7.904          0.12
```

```
  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        0.88     2.77       7.904
      2        1.00     3.23       7.904

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       1.00   Tc(MIN.) =    3.23
  TOTAL AREA(ACRES) =        0.1
  LONGEST FLOWPATH FROM NODE     13.00 TO NODE    402.00 =     107.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    402.00 TO NODE    403.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0220
  FLOW LENGTH(FEET) =    71.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   3.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.39
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.00
  PIPE TRAVEL TIME(MIN.) =   0.22    Tc(MIN.) =    3.45
  LONGEST FLOWPATH FROM NODE     13.00 TO NODE    403.00 =     178.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    403.00 TO NODE    403.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 7A.1                                                    |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     17.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    60.00
  UPSTREAM ELEVATION(FEET) =   1364.50
  DOWNSTREAM ELEVATION(FEET) =   1363.30
  ELEVATION DIFFERENCE(FEET) =      1.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.877
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.27
  TOTAL AREA(ACRES) =      0.04   TOTAL RUNOFF(CFS) =      0.27

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 7A.2                                                    |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     17.00 TO NODE     18.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0120
```

```
  CHANNEL LENGTH THRU SUBAREA(FEET) =    83.00
  "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.100
  PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   0.50
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      1.86
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.25
  AVERAGE FLOW DEPTH(FEET) =   0.20   FLOOD WIDTH(FEET) =   11.76
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.61   Tc(MIN.) =    3.49
  SUBAREA AREA(ACRES) =    0.48       SUBAREA RUNOFF(CFS) =    3.19
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.840
  TOTAL AREA(ACRES) =        0.5         PEAK FLOW RATE(CFS) =       3.45

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.24   FLOOD WIDTH(FEET) =   15.87
  FLOW VELOCITY(FEET/SEC.) =   2.48   DEPTH*VELOCITY(FT*FT/SEC) =   0.59
  LONGEST FLOWPATH FROM NODE     16.00 TO NODE     18.00 =     143.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     18.00 TO NODE    403.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0050
  FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   9.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.18
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.45
  PIPE TRAVEL TIME(MIN.) =   0.30    Tc(MIN.) =    3.79
  LONGEST FLOWPATH FROM NODE     16.00 TO NODE    403.00 =     218.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    403.00 TO NODE    403.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER       (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1         3.45     3.79       7.904        0.52
  LONGEST FLOWPATH FROM NODE     16.00 TO NODE    403.00 =     218.00 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER       (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1         1.00     3.45       7.904        0.15
  LONGEST FLOWPATH FROM NODE     13.00 TO NODE    403.00 =     178.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1       4.13       3.45        7.904
      2       4.45       3.79        7.904

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       4.45   Tc(MIN.) =    3.79
  TOTAL AREA(ACRES) =        0.7

****************************************************************************
  FLOW PROCESS FROM NODE    403.00 TO NODE    403.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    403.00 TO NODE    403.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0600
  FLOW LENGTH(FEET) =    13.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.40
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.45
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =    3.81
  LONGEST FLOWPATH FROM NODE     16.00 TO NODE    403.00 =     231.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    404.00 TO NODE    404.00 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         4.45     3.81       7.904        0.67
  LONGEST FLOWPATH FROM NODE     16.00 TO NODE    404.00 =     231.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER       (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1         7.33     5.57       7.375        1.12
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE    404.00 =     525.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1       9.47       3.81        7.904
      2      11.48       5.57        7.375

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      11.48   Tc(MIN.) =    5.57
  TOTAL AREA(ACRES) =        1.8

****************************************************************************
  FLOW PROCESS FROM NODE    404.00 TO NODE    404.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 8A                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     19.00 TO NODE     20.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .6900
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  91
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    81.00
  UPSTREAM ELEVATION(FEET) =   1363.70
  DOWNSTREAM ELEVATION(FEET) =   1358.10
  ELEVATION DIFFERENCE(FEET) =      5.60
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.487
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
```

```
  SUBAREA RUNOFF(CFS) =      0.44
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.44

+---------------------------------------------------------------------------+
| DRAINAGE SUBAREA 9A.1                                                     |
|                                                                           |
|                                                                           |
+---------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     21.00 TO NODE     22.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1404.00
  DOWNSTREAM ELEVATION(FEET) =   1399.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.422
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.647
  SUBAREA RUNOFF(CFS) =      0.68
  TOTAL AREA(ACRES) =      0.40   TOTAL RUNOFF(CFS) =      0.68

+---------------------------------------------------------------------------+
| DRAINAGE SUBAREA 9A.2                                                     |
|                                                                           |
|                                                                           |
+---------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     22.00 TO NODE     23.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   550.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0550
  CHANNEL BASE(FEET) =   60.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.825
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.31
  AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   6.98
  Tc(MIN.) =   15.40
  SUBAREA AREA(ACRES) =     3.57       SUBAREA RUNOFF(CFS) =    4.10
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =        4.0         PEAK FLOW RATE(CFS) =       4.56

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.05   FLOW VELOCITY(FEET/SEC.) =   1.56
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     23.00 =     650.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     23.00 TO NODE    100.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0300
  FLOW LENGTH(FEET) =   278.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.78
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.56
  PIPE TRAVEL TIME(MIN.) =   0.53    Tc(MIN.) =   15.93
```

```
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE    100.00 =     928.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 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        4.56    15.93       3.743        3.97
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE    100.00 =     928.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        0.59     8.57       5.586        0.15
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE    100.00 =     293.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1       3.04       8.57        5.586
      2       4.95      15.93        3.743

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       4.95   Tc(MIN.) =   15.93
  TOTAL AREA(ACRES) =        4.1

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    35.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS   7.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.55
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.95
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =   16.04
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE    101.00 =     963.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    101.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   16.04
  RAINFALL INTENSITY(INCH/HR) =   3.73
  TOTAL STREAM AREA(ACRES) =     4.12
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.95

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 10A.1                                                   |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     24.00 TO NODE     25.00 IS CODE =  21
```

```
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .6900
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  92
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    64.00
  UPSTREAM ELEVATION(FEET) =   1359.00
  DOWNSTREAM ELEVATION(FEET) =   1357.60
  ELEVATION DIFFERENCE(FEET) =      1.40
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.548
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.16
  TOTAL AREA(ACRES) =      0.03   TOTAL RUNOFF(CFS) =      0.16

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 10A.2                                                   |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE    101.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =    71.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0270
  CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.286
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .6900
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  92
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.39
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.05
  AVERAGE FLOW DEPTH(FEET) =   0.01   TRAVEL TIME(MIN.) =   1.13
  Tc(MIN.) =    5.67
  SUBAREA AREA(ACRES) =     0.09       SUBAREA RUNOFF(CFS) =    0.45
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.690
  TOTAL AREA(ACRES) =        0.1         PEAK FLOW RATE(CFS) =       0.60

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.02   FLOW VELOCITY(FEET/SEC.) =   1.11
  LONGEST FLOWPATH FROM NODE     24.00 TO NODE    101.00 =     135.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    101.00 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.) =    5.67
  RAINFALL INTENSITY(INCH/HR) =   7.29
  TOTAL STREAM AREA(ACRES) =     0.12
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.60

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        4.95    16.04        3.727          4.12
      2        0.60     5.67        7.286          0.12

  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        2.36     5.67       7.286
      2        5.26    16.04       3.727

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       5.26   Tc(MIN.) =   16.04
  TOTAL AREA(ACRES) =        4.2
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE    101.00 =     963.00 FEET.

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1B                                                        |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     31.00 TO NODE     32.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    36.00
  UPSTREAM ELEVATION(FEET) =   1364.30
  DOWNSTREAM ELEVATION(FEET) =   1363.90
  ELEVATION DIFFERENCE(FEET) =      0.40
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.711
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.33
  TOTAL AREA(ACRES) =      0.05   TOTAL RUNOFF(CFS) =      0.33

****************************************************************************
  FLOW PROCESS FROM NODE     32.00 TO NODE     33.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    94.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   6.0 INCH PIPE IS   3.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.03
  GIVEN PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.33
  PIPE TRAVEL TIME(MIN.) =   0.52    Tc(MIN.) =    3.23
  LONGEST FLOWPATH FROM NODE     31.00 TO NODE     33.00 =     130.00 FEET.

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2B                                                        |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8400
  SUBAREA AREA(ACRES) =    0.05   SUBAREA RUNOFF(CFS) =    0.33
  TOTAL AREA(ACRES) =        0.1   TOTAL RUNOFF(CFS) =       0.66
  TC(MIN.) =    3.23

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

```
 FLOW PROCESS FROM NODE     33.00 TO NODE    200.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0640
 FLOW LENGTH(FEET) =    13.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN   6.0 INCH PIPE IS   2.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.22
 GIVEN PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.66
 PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =    3.26
 LONGEST FLOWPATH FROM NODE     31.00 TO NODE    200.00 =     143.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    200.00 TO NODE     34.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0180
 FLOW LENGTH(FEET) =    99.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN   6.0 INCH PIPE IS   4.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.42
 GIVEN PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.66
 PIPE TRAVEL TIME(MIN.) =   0.37    Tc(MIN.) =    3.63
 LONGEST FLOWPATH FROM NODE     31.00 TO NODE     34.00 =     242.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     34.00 TO NODE     36.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =    12.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0170
 CHANNEL BASE(FEET) =    6.00   "Z" FACTOR =   0.000
 MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
 CHANNEL FLOW THRU SUBAREA(CFS) =       0.66
 FLOW VELOCITY(FEET/SEC.) =   1.90   FLOW DEPTH(FEET) =   0.06
 TRAVEL TIME(MIN.) =   0.11   Tc(MIN.) =    3.74
 LONGEST FLOWPATH FROM NODE     31.00 TO NODE     36.00 =     254.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     36.00 TO NODE     36.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =    3.74
 RAINFALL INTENSITY(INCH/HR) =   7.90
 TOTAL STREAM AREA(ACRES) =     0.10
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.66

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 3B                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
 FLOW PROCESS FROM NODE     35.00 TO NODE     36.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  96
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    89.00
```

```
  UPSTREAM ELEVATION(FEET) =   1364.10
  DOWNSTREAM ELEVATION(FEET) =   1358.00
  ELEVATION DIFFERENCE(FEET) =      6.10
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.324
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.27
  TOTAL AREA(ACRES) =      0.04   TOTAL RUNOFF(CFS) =      0.27

****************************************************************************
  FLOW PROCESS FROM NODE     36.00 TO NODE     36.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    2.32
  RAINFALL INTENSITY(INCH/HR) =   7.90
  TOTAL STREAM AREA(ACRES) =     0.04
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.27

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        0.66     3.74        7.904          0.10
      2        0.27     2.32        7.904          0.04

  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        0.68     2.32       7.904
      2        0.93     3.74       7.904

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       0.93   Tc(MIN.) =    3.74
  TOTAL AREA(ACRES) =        0.1
  LONGEST FLOWPATH FROM NODE     31.00 TO NODE     36.00 =     254.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     36.00 TO NODE    201.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =     1.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   3.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.00
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.93
  PIPE TRAVEL TIME(MIN.) =   0.00    Tc(MIN.) =    3.74
  LONGEST FLOWPATH FROM NODE     31.00 TO NODE    201.00 =     255.00 FEET.

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 4B                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     37.00 TO NODE     38.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    49.00
  UPSTREAM ELEVATION(FEET) =   1363.00
  DOWNSTREAM ELEVATION(FEET) =   1362.20
  ELEVATION DIFFERENCE(FEET) =      0.80
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.782
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.73
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.73

****************************************************************************
  FLOW PROCESS FROM NODE     38.00 TO NODE    202.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    64.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   3.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.62
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.73
  PIPE TRAVEL TIME(MIN.) =   0.29    Tc(MIN.) =    3.08
  LONGEST FLOWPATH FROM NODE     37.00 TO NODE    202.00 =     113.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    202.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    3.08
  RAINFALL INTENSITY(INCH/HR) =   7.90
  TOTAL STREAM AREA(ACRES) =     0.11
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.73

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 5B                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     39.00 TO NODE     40.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    54.00
  UPSTREAM ELEVATION(FEET) =   1364.30
  DOWNSTREAM ELEVATION(FEET) =   1362.00
  ELEVATION DIFFERENCE(FEET) =      2.30
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.122
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.40
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.40

****************************************************************************
  FLOW PROCESS FROM NODE     40.00 TO NODE    202.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0380
  FLOW LENGTH(FEET) =    15.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   1.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.92
```

```
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.40
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    2.17
  LONGEST FLOWPATH FROM NODE     39.00 TO NODE    202.00 =      69.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    202.00 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.) =    2.17
  RAINFALL INTENSITY(INCH/HR) =   7.90
  TOTAL STREAM AREA(ACRES) =     0.06
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.40

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        0.73     3.08        7.904          0.11
      2        0.40     2.17        7.904          0.06

  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        0.91     2.17       7.904
      2        1.13     3.08       7.904

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       1.13   Tc(MIN.) =    3.08
  TOTAL AREA(ACRES) =        0.2
  LONGEST FLOWPATH FROM NODE     37.00 TO NODE    202.00 =     113.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    203.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.1100
  FLOW LENGTH(FEET) =    54.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   2.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.68
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.13
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =    3.17
  LONGEST FLOWPATH FROM NODE     37.00 TO NODE    203.00 =     167.00 FEET.

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 6B                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    203.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8400
  SUBAREA AREA(ACRES) =    0.00   SUBAREA RUNOFF(CFS) =    0.03
```

```
  TOTAL AREA(ACRES) =        0.2   TOTAL RUNOFF(CFS) =       1.16
  TC(MIN.) =    3.17

+-------------------------------------------------------------------------+
| DRAINAGE SUBAREA 7B.1                                                   |
|                                                                         |
|                                                                         |
+-------------------------------------------------------------------------+

*************************************************************************
  FLOW PROCESS FROM NODE     42.00 TO NODE     43.00 IS CODE =  21
-------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
=========================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1361.10
  DOWNSTREAM ELEVATION(FEET) =   1358.60
  ELEVATION DIFFERENCE(FEET) =      2.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.863
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.53
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.53

+-------------------------------------------------------------------------+
| DRAINAGE SUBAREA 7B.2                                                   |
|                                                                         |
|                                                                         |
+-------------------------------------------------------------------------+

*************************************************************************
  FLOW PROCESS FROM NODE     43.00 TO NODE     44.00 IS CODE =  51
-------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
=========================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =    36.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0360
  CHANNEL BASE(FEET) =    8.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.60
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.12
  AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   0.28
  Tc(MIN.) =    3.15
  SUBAREA AREA(ACRES) =     0.02       SUBAREA RUNOFF(CFS) =    0.13
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.840
  TOTAL AREA(ACRES) =        0.1         PEAK FLOW RATE(CFS) =       0.66

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.04   FLOW VELOCITY(FEET/SEC.) =   2.02
  LONGEST FLOWPATH FROM NODE     42.00 TO NODE     44.00 =     116.00 FEET.

+-------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1C.1                                                   |
|                                                                         |
|                                                                         |
+-------------------------------------------------------------------------+

*************************************************************************
  FLOW PROCESS FROM NODE     51.00 TO NODE     52.00 IS CODE =  21
-------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
=========================================================================
```

```
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1401.00
  DOWNSTREAM ELEVATION(FEET) =   1397.00
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.072
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.382
  SUBAREA RUNOFF(CFS) =      0.50
  TOTAL AREA(ACRES) =      0.31   TOTAL RUNOFF(CFS) =      0.50

+---------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1C.2                                                     |
|                                                                           |
|                                                                           |
+---------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     52.00 TO NODE     53.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   380.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0710
  CHANNEL BASE(FEET) =   60.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.012
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  79
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       2.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.21
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   5.24
  Tc(MIN.) =   14.31
  SUBAREA AREA(ACRES) =     1.80       SUBAREA RUNOFF(CFS) =    3.03
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.402
  TOTAL AREA(ACRES) =        2.1         PEAK FLOW RATE(CFS) =       3.41

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.04   FLOW VELOCITY(FEET/SEC.) =   1.61
  LONGEST FLOWPATH FROM NODE     51.00 TO NODE     53.00 =     480.00 FEET.

+---------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1C.3                                                     |
|                                                                           |
|                                                                           |
+---------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     53.00 TO NODE     54.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0260
  CHANNEL LENGTH THRU SUBAREA(FEET) =   385.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.090
  PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   0.50
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.717
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8300
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  92
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      4.18
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.56
  AVERAGE FLOW DEPTH(FEET) =   0.19   FLOOD WIDTH(FEET) =   14.30
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.80   Tc(MIN.) =   16.11
  SUBAREA AREA(ACRES) =    0.50       SUBAREA RUNOFF(CFS) =    1.54
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.484
```

```
  TOTAL AREA(ACRES) =        2.6         PEAK FLOW RATE(CFS) =       4.70

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.20   FLOOD WIDTH(FEET) =   15.08
  FLOW VELOCITY(FEET/SEC.) =   3.65   DEPTH*VELOCITY(FT*FT/SEC) =   0.73
  LONGEST FLOWPATH FROM NODE     51.00 TO NODE     54.00 =     865.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     54.00 TO NODE     55.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0130
  FLOW LENGTH(FEET) =   166.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.50
  GIVEN PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.70
  PIPE TRAVEL TIME(MIN.) =   0.43    Tc(MIN.) =   16.53
  LONGEST FLOWPATH FROM NODE     51.00 TO NODE     55.00 =    1031.00 FEET.

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2C                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     55.00 TO NODE     55.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.655
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5499
  SUBAREA AREA(ACRES) =    0.59   SUBAREA RUNOFF(CFS) =    1.81
  TOTAL AREA(ACRES) =        3.2   TOTAL RUNOFF(CFS) =       6.43
  TC(MIN.) =   16.53

****************************************************************************
  FLOW PROCESS FROM NODE     55.00 TO NODE     55.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 3C.1                                                    |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     56.00 TO NODE     57.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  ARTIICIAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .8700
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
  UPSTREAM ELEVATION(FEET) =   1370.50
  DOWNSTREAM ELEVATION(FEET) =   1365.90
  ELEVATION DIFFERENCE(FEET) =      4.60
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.280
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.28
  TOTAL AREA(ACRES) =      0.04   TOTAL RUNOFF(CFS) =      0.28
```

```
+-------------------------------------------------------------------------+
| DRAINAGE SUBAREA 3C.2                                                   |
|                                                                         |
|                                                                         |
+-------------------------------------------------------------------------+

**************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     58.00 IS CODE =  91
--------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
==========================================================================
  REPRESENTATIVE SLOPE =  0.0200
  CHANNEL LENGTH THRU SUBAREA(FEET) =   297.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.090
  PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.20000
  MAXIMUM DEPTH(FEET) =   0.50
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      1.34
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.82
  AVERAGE FLOW DEPTH(FEET) =   0.14   FLOOD WIDTH(FEET) =    5.38
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.75   Tc(MIN.) =    4.03
  SUBAREA AREA(ACRES) =    0.32       SUBAREA RUNOFF(CFS) =    2.12
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.843
  TOTAL AREA(ACRES) =        0.4         PEAK FLOW RATE(CFS) =       2.40

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.18   FLOOD WIDTH(FEET) =    5.76
  FLOW VELOCITY(FEET/SEC.) =   3.52   DEPTH*VELOCITY(FT*FT/SEC) =   0.62
  LONGEST FLOWPATH FROM NODE     56.00 TO NODE     58.00 =     387.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE     58.00 TO NODE    300.00 IS CODE =  41
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==========================================================================
  REPRESENTATIVE SLOPE =  0.0110
  FLOW LENGTH(FEET) =    34.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.16
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.40
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =    4.14
  LONGEST FLOWPATH FROM NODE     56.00 TO NODE    300.00 =     421.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    300.00 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.) =    4.14
  RAINFALL INTENSITY(INCH/HR) =   7.90
  TOTAL STREAM AREA(ACRES) =     0.36
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.40

+-------------------------------------------------------------------------+
| DRAINAGE SUBAREA 4C.1                                                   |
|                                                                         |
|                                                                         |
+-------------------------------------------------------------------------+

**************************************************************************
  FLOW PROCESS FROM NODE     59.00 TO NODE     60.00 IS CODE =  21
```

```
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  ARTIICIAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .8700
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    60.00
  UPSTREAM ELEVATION(FEET) =   1370.50
  DOWNSTREAM ELEVATION(FEET) =   1365.40
  ELEVATION DIFFERENCE(FEET) =      5.10
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.571
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.21
  TOTAL AREA(ACRES) =      0.03   TOTAL RUNOFF(CFS) =      0.21

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 4C.2                                                    |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     60.00 TO NODE     61.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =    70.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0900
  CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   0.330
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  ARTIICIAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .8700
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.24
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.89
  AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   0.40
  Tc(MIN.) =    1.97
  SUBAREA AREA(ACRES) =     0.01       SUBAREA RUNOFF(CFS) =    0.07
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.870
  TOTAL AREA(ACRES) =        0.0         PEAK FLOW RATE(CFS) =       0.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.03   FLOW VELOCITY(FEET/SEC.) =   2.74
  LONGEST FLOWPATH FROM NODE     59.00 TO NODE     61.00 =     130.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     61.00 TO NODE    300.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    27.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   2.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.72
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.28
  PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =    2.14
  LONGEST FLOWPATH FROM NODE     59.00 TO NODE    300.00 =     157.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    300.00 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.) =    2.14
  RAINFALL INTENSITY(INCH/HR) =   7.90
  TOTAL STREAM AREA(ACRES) =     0.04
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.28

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        2.40     4.14        7.904          0.36
      2        0.28     2.14        7.904          0.04

  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        1.51     2.14       7.904
      2        2.67     4.14       7.904

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       2.67   Tc(MIN.) =    4.14
  TOTAL AREA(ACRES) =        0.4
  LONGEST FLOWPATH FROM NODE     56.00 TO NODE    300.00 =     421.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE     55.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0220
  FLOW LENGTH(FEET) =    64.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   5.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.83
  GIVEN PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.67
  PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =    4.30
  LONGEST FLOWPATH FROM NODE     56.00 TO NODE     55.00 =     485.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     55.00 TO NODE     55.00 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        2.67     4.30       7.904        0.40
  LONGEST FLOWPATH FROM NODE     56.00 TO NODE     55.00 =     485.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        6.43    16.53       3.655        3.20
  LONGEST FLOWPATH FROM NODE     51.00 TO NODE     55.00 =    1031.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1       4.35       4.30        7.904
      2       7.67      16.53        3.655

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       7.67   Tc(MIN.) =   16.53
  TOTAL AREA(ACRES) =        3.6

****************************************************************************
  FLOW PROCESS FROM NODE     55.00 TO NODE     55.00 IS CODE =  12
```

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

******************************************************************************
  FLOW PROCESS FROM NODE     55.00 TO NODE     62.00 IS CODE =  41
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==============================================================================
  REPRESENTATIVE SLOPE =  0.0150
  FLOW LENGTH(FEET) =   173.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS   9.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.76
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.67
  PIPE TRAVEL TIME(MIN.) =   0.37    Tc(MIN.) =   16.91
  LONGEST FLOWPATH FROM NODE     51.00 TO NODE     62.00 =    1204.00 FEET.

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 5C                                                        |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

******************************************************************************
  FLOW PROCESS FROM NODE     62.00 TO NODE     62.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.603
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6108
  SUBAREA AREA(ACRES) =    0.44   SUBAREA RUNOFF(CFS) =    1.33
  TOTAL AREA(ACRES) =        4.0   TOTAL RUNOFF(CFS) =       8.89
  TC(MIN.) =   16.91

******************************************************************************
  FLOW PROCESS FROM NODE     62.00 TO NODE     66.00 IS CODE =  41
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    84.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  10.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.91
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.89
  PIPE TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =   17.11
  LONGEST FLOWPATH FROM NODE     51.00 TO NODE     66.00 =    1288.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE     66.00 TO NODE     66.00 IS CODE =   1
------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   17.11
  RAINFALL INTENSITY(INCH/HR) =   3.58
  TOTAL STREAM AREA(ACRES) =     4.04
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.89

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 6C.1                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     63.00 TO NODE     64.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    53.00
  UPSTREAM ELEVATION(FEET) =   1359.30
  DOWNSTREAM ELEVATION(FEET) =   1358.70
  ELEVATION DIFFERENCE(FEET) =      0.60
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.269
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.73
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      0.73

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 6C.2                                                    |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     64.00 TO NODE     65.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0110
  CHANNEL LENGTH THRU SUBAREA(FEET) =   188.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.090
  PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   0.50
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      1.89
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.19
  AVERAGE FLOW DEPTH(FEET) =   0.17   FLOOD WIDTH(FEET) =   11.95
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.43   Tc(MIN.) =    4.70
  SUBAREA AREA(ACRES) =    0.35       SUBAREA RUNOFF(CFS) =    2.32
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.840
  TOTAL AREA(ACRES) =        0.5         PEAK FLOW RATE(CFS) =       3.05

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.20   FLOOD WIDTH(FEET) =   15.08
  FLOW VELOCITY(FEET/SEC.) =   2.37   DEPTH*VELOCITY(FT*FT/SEC) =   0.48
  LONGEST FLOWPATH FROM NODE     63.00 TO NODE     65.00 =     241.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     65.00 TO NODE     66.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0150
  FLOW LENGTH(FEET) =   105.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.15
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.05
  PIPE TRAVEL TIME(MIN.) =   0.28    Tc(MIN.) =    4.98
  LONGEST FLOWPATH FROM NODE     63.00 TO NODE     66.00 =     346.00 FEET.

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 7C                                                      |
```

```
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+

******************************************************************************
  FLOW PROCESS FROM NODE     66.00 TO NODE     66.00 IS CODE =  81
------------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==============================================================================
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8400
  SUBAREA AREA(ACRES) =    0.24   SUBAREA RUNOFF(CFS) =    1.59
  TOTAL AREA(ACRES) =        0.7   TOTAL RUNOFF(CFS) =       4.65
  TC(MIN.) =    4.98

******************************************************************************
  FLOW PROCESS FROM NODE     66.00 TO NODE     66.00 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.) =    4.98
  RAINFALL INTENSITY(INCH/HR) =   7.90
  TOTAL STREAM AREA(ACRES) =     0.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.65

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        8.89    17.11        3.575          4.04
      2        4.65     4.98        7.904          0.70

  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        7.24     4.98       7.904
      2       10.99    17.11       3.575

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      10.99   Tc(MIN.) =   17.11
  TOTAL AREA(ACRES) =        4.7
  LONGEST FLOWPATH FROM NODE     51.00 TO NODE     66.00 =    1288.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE     66.00 TO NODE     67.00 IS CODE =  41
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    76.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  11.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.30
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.99
  PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =   17.28
  LONGEST FLOWPATH FROM NODE     51.00 TO NODE     67.00 =    1364.00 FEET.

+------------------------------------------------------------------------------+
| DRAINAGE SUBAREA 8C                                                          |
|                                                                              |
|                                                                              |
```

```
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     67.00 TO NODE     67.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.552
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8300
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  92
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6567
  SUBAREA AREA(ACRES) =    0.33   SUBAREA RUNOFF(CFS) =    0.97
  TOTAL AREA(ACRES) =        5.1   TOTAL RUNOFF(CFS) =      11.83
  TC(MIN.) =   17.28

****************************************************************************
  FLOW PROCESS FROM NODE     67.00 TO NODE    301.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0130
  FLOW LENGTH(FEET) =     6.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  11.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.20
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.83
  PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =   17.29
  LONGEST FLOWPATH FROM NODE     51.00 TO NODE    301.00 =    1370.00 FEET.

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 9C.1                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     68.00 TO NODE     69.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8300
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  92
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    60.00
  UPSTREAM ELEVATION(FEET) =   1356.20
  DOWNSTREAM ELEVATION(FEET) =   1355.00
  ELEVATION DIFFERENCE(FEET) =      1.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.988
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.13
  TOTAL AREA(ACRES) =      0.02   TOTAL RUNOFF(CFS) =      0.13

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 9C.2                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     69.00 TO NODE     70.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   129.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0080
  CHANNEL BASE(FEET) =    1.50   "Z" FACTOR =  13.090
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
```

```
  25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8300
 SOIL CLASSIFICATION IS "A"
 S.C.S. CURVE NUMBER (AMC II) =  92
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.49
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.53
 AVERAGE FLOW DEPTH(FEET) =   0.11   TRAVEL TIME(MIN.) =   1.41
 Tc(MIN.) =    4.39
 SUBAREA AREA(ACRES) =     0.11       SUBAREA RUNOFF(CFS) =    0.72
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.830
 TOTAL AREA(ACRES) =        0.1         PEAK FLOW RATE(CFS) =       0.85

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.14   FLOW VELOCITY(FEET/SEC.) =   1.79
 LONGEST FLOWPATH FROM NODE     68.00 TO NODE     70.00 =     189.00 FEET.

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1D.1                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
 FLOW PROCESS FROM NODE     81.00 TO NODE     82.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  85
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
 UPSTREAM ELEVATION(FEET) =   1452.00
 DOWNSTREAM ELEVATION(FEET) =   1429.00
 ELEVATION DIFFERENCE(FEET) =     23.00
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.684
 WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
  25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.554
 SUBAREA RUNOFF(CFS) =      1.12
 TOTAL AREA(ACRES) =      0.57   TOTAL RUNOFF(CFS) =      1.12

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1D.2                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
 FLOW PROCESS FROM NODE     82.00 TO NODE     83.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =   651.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0940
 CHANNEL BASE(FEET) =  100.00   "Z" FACTOR =   0.000
 MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
  25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.077
 RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .2700
 SOIL CLASSIFICATION IS "A"
 S.C.S. CURVE NUMBER (AMC II) =  45
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.13
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.49
 AVERAGE FLOW DEPTH(FEET) =   0.03   TRAVEL TIME(MIN.) =   7.27
 Tc(MIN.) =   13.95
 SUBAREA AREA(ACRES) =     5.18       SUBAREA RUNOFF(CFS) =    5.70
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.273
 TOTAL AREA(ACRES) =        5.8         PEAK FLOW RATE(CFS) =       6.40

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.04   FLOW VELOCITY(FEET/SEC.) =   1.81
```

```
  LONGEST FLOWPATH FROM NODE     81.00 TO NODE     83.00 =     751.00 FEET.

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1D.3                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     83.00 TO NODE     84.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0560
  CHANNEL LENGTH THRU SUBAREA(FEET) =   181.00
  "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.800
  PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.20000
  MAXIMUM DEPTH(FEET) =   1.00
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  4.030
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      6.50
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.71
  AVERAGE FLOW DEPTH(FEET) =   0.80   FLOOD WIDTH(FEET) =    3.00
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.26   Tc(MIN.) =   14.21
  SUBAREA AREA(ACRES) =    0.10       SUBAREA RUNOFF(CFS) =    0.19
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.277
  TOTAL AREA(ACRES) =        5.8         PEAK FLOW RATE(CFS) =       6.52

         NOTE:TRAVEL TIME ESTIMATES BASED ON NORMAL DEPTH
         IN A FLOWING-FULL GUTTER(NORMAL DEPTH = GUTTER HIKE)


  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.80   FLOOD WIDTH(FEET) =    3.00
  FLOW VELOCITY(FEET/SEC.) =  11.71   DEPTH*VELOCITY(FT*FT/SEC) =   9.37
  LONGEST FLOWPATH FROM NODE     81.00 TO NODE     84.00 =     932.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     84.00 TO NODE     86.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =    41.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0120
  CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   0.330
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
  CHANNEL FLOW THRU SUBAREA(CFS) =       6.52
  FLOW VELOCITY(FEET/SEC.) =   4.77   FLOW DEPTH(FEET) =   0.33
  TRAVEL TIME(MIN.) =   0.14   Tc(MIN.) =   14.35
  LONGEST FLOWPATH FROM NODE     81.00 TO NODE     86.00 =     973.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     86.00 TO NODE     86.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.35
  RAINFALL INTENSITY(INCH/HR) =   4.00
  TOTAL STREAM AREA(ACRES) =     5.85
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.52

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2D                                                        |
|                                                                            |
|                                                                            |
```

```
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     85.00 TO NODE     86.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    22.00
  UPSTREAM ELEVATION(FEET) =   1358.00
  DOWNSTREAM ELEVATION(FEET) =   1357.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.078
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  7.904
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.28
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.28

****************************************************************************
  FLOW PROCESS FROM NODE     86.00 TO NODE     86.00 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.) =    4.08
  RAINFALL INTENSITY(INCH/HR) =   7.90
  TOTAL STREAM AREA(ACRES) =     0.12
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.28

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        6.52    14.35        4.004          5.85
      2        0.28     4.08        7.904          0.12

  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        2.14     4.08       7.904
      2        6.66    14.35       4.004

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       6.66   Tc(MIN.) =   14.35
  TOTAL AREA(ACRES) =        6.0
  LONGEST FLOWPATH FROM NODE     81.00 TO NODE     86.00 =     973.00 FEET.

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1E                                                        |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     91.00 TO NODE     92.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2000
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  63
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    86.00
  UPSTREAM ELEVATION(FEET) =   1358.00
  DOWNSTREAM ELEVATION(FEET) =   1351.10
  ELEVATION DIFFERENCE(FEET) =      6.90
```

```
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.505
    25 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.083
  SUBAREA RUNOFF(CFS) =      0.15
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.15
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        0.1  TC(MIN.) =      7.50
  PEAK FLOW RATE(CFS)   =       0.15
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

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

            RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM PACKAGE
            Reference: SAN DIEGO COUNTY FLOOD CONTROL DISTRICT
                         2003,1985,1981 HYDROLOGY MANUAL
          (c) Copyright 1982-2015 Advanced Engineering Software (aes)
              Ver. 22.0 Release Date: 07/01/2015  License ID 1510

                            Analysis prepared by:

                            DRC Engineering, Inc.
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                             Anaheim Hills, CA 92808
                                  714-685-6860

 ************************* DESCRIPTION OF STUDY *************************
* 19-132 GS VALLEY EXPANSION (28435 LIZARD ROCKS ROAD)                    *
* PROPOSED CONDITION                                                      *
* 100-YEAR STORM EVENT                                                    *
 ************************************************************************

  FILE NAME: 19132P00.DAT
  TIME/DATE OF STUDY: 11:13 05/19/2021
------------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
------------------------------------------------------------------------------
  2003 SAN DIEGO MANUAL CRITERIA

  USER SPECIFIED STORM EVENT(YEAR) = 100.00
  6-HOUR DURATION PRECIPITATION (INCHES) =   4.500
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  SAN DIEGO HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: USE MODIFIED RATIONAL METHOD PROCEDURES FOR CONFLUENCE ANALYSIS
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)   (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   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.*

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1A.1                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

******************************************************************************
  FLOW PROCESS FROM NODE      1.00 TO NODE      2.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .6900
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  92
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    69.00
  UPSTREAM ELEVATION(FEET) =   1364.00
  DOWNSTREAM ELEVATION(FEET) =   1362.10
  ELEVATION DIFFERENCE(FEET) =      1.90
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.374
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.25
```

```
  TOTAL AREA(ACRES) =      0.03   TOTAL RUNOFF(CFS) =      0.25

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1A.2                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE      2.00 TO NODE      3.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   162.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0390
  CHANNEL BASE(FEET) =   45.00   "Z" FACTOR =   2.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.50
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.539
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .6900
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  92
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.62
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   0.68
  AVERAGE FLOW DEPTH(FEET) =   0.02   TRAVEL TIME(MIN.) =   3.94
  Tc(MIN.) =    8.32
  SUBAREA AREA(ACRES) =     0.12       SUBAREA RUNOFF(CFS) =    0.71
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.690
  TOTAL AREA(ACRES) =        0.1         PEAK FLOW RATE(CFS) =       0.88

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.03   FLOW VELOCITY(FEET/SEC.) =   0.76
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE      3.00 =     231.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      3.00 TO NODE    100.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0120
  FLOW LENGTH(FEET) =    62.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS   3.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.58
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.88
  PIPE TRAVEL TIME(MIN.) =   0.29    Tc(MIN.) =    8.61
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE    100.00 =     293.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2A.1                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE      4.00 TO NODE      5.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    49.00
  UPSTREAM ELEVATION(FEET) =   1363.70
```

```
  DOWNSTREAM ELEVATION(FEET) =   1363.20
  ELEVATION DIFFERENCE(FEET) =      0.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.254
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.30
  TOTAL AREA(ACRES) =      0.03   TOTAL RUNOFF(CFS) =      0.30

+---------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2A.2                                                     |
|                                                                           |
|                                                                           |
+---------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE      5.00 TO NODE      6.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0060
  CHANNEL LENGTH THRU SUBAREA(FEET) =    33.00
  "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.100
  PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   0.50
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      0.70
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.47
  AVERAGE FLOW DEPTH(FEET) =   0.16   FLOOD WIDTH(FEET) =    8.26
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.38   Tc(MIN.) =    3.63
  SUBAREA AREA(ACRES) =    0.08       SUBAREA RUNOFF(CFS) =    0.80
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.840
  TOTAL AREA(ACRES) =        0.1         PEAK FLOW RATE(CFS) =       1.10

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.19   FLOOD WIDTH(FEET) =   10.69
  FLOW VELOCITY(FEET/SEC.) =   1.55   DEPTH*VELOCITY(FT*FT/SEC) =   0.29
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE      6.00 =      82.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      6.00 TO NODE    400.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0050
  FLOW LENGTH(FEET) =   127.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   6.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.10
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.10
  PIPE TRAVEL TIME(MIN.) =   0.68    Tc(MIN.) =    4.31
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE    400.00 =     209.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    400.00 TO NODE    400.00 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.) =    4.31
  RAINFALL INTENSITY(INCH/HR) =  11.86
  TOTAL STREAM AREA(ACRES) =     0.11
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.10

+---------------------------------------------------------------------------+
```

```
| DRAINAGE SUBAREA 3A.1                                                          |
|                                                                                |
|                                                                                |
+--------------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE      7.00 TO NODE      8.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    60.00
  UPSTREAM ELEVATION(FEET) =   1364.50
  DOWNSTREAM ELEVATION(FEET) =   1363.30
  ELEVATION DIFFERENCE(FEET) =      1.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.877
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.80
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.80

+--------------------------------------------------------------------------------+
| DRAINAGE SUBAREA 3A.2                                                          |
|                                                                                |
|                                                                                |
+--------------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE      8.00 TO NODE      9.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0060
  CHANNEL LENGTH THRU SUBAREA(FEET) =    90.00
  "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.100
  PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   0.50
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      2.99
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.81
  AVERAGE FLOW DEPTH(FEET) =   0.25   FLOOD WIDTH(FEET) =   17.40
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.83   Tc(MIN.) =    3.70
  SUBAREA AREA(ACRES) =    0.44       SUBAREA RUNOFF(CFS) =    4.38
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.840
  TOTAL AREA(ACRES) =        0.5         PEAK FLOW RATE(CFS) =       5.18

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.30   FLOOD WIDTH(FEET) =   22.12
  FLOW VELOCITY(FEET/SEC.) =   2.01   DEPTH*VELOCITY(FT*FT/SEC) =   0.60
  LONGEST FLOWPATH FROM NODE      7.00 TO NODE      9.00 =     150.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE      9.00 TO NODE    400.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0170
  FLOW LENGTH(FEET) =     6.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.37
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.18
  PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =    3.72
```

```
 LONGEST FLOWPATH FROM NODE      7.00 TO NODE    400.00 =     156.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    400.00 TO NODE    400.00 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.) =    3.72
 RAINFALL INTENSITY(INCH/HR) =  11.86
 TOTAL STREAM AREA(ACRES) =     0.52
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.18

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        1.10     4.31       11.856          0.11
     2        5.18     3.72       11.856          0.52

 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        6.12     3.72      11.856
     2        6.27     4.31      11.856

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       6.27   Tc(MIN.) =    4.31
 TOTAL AREA(ACRES) =        0.6
 LONGEST FLOWPATH FROM NODE      4.00 TO NODE    400.00 =     209.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    400.00 TO NODE    401.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0050
 FLOW LENGTH(FEET) =   227.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.82
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       6.27
 PIPE TRAVEL TIME(MIN.) =   0.78    Tc(MIN.) =    5.10
 LONGEST FLOWPATH FROM NODE      4.00 TO NODE    401.00 =     436.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    401.00 TO NODE    401.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =    5.10
 RAINFALL INTENSITY(INCH/HR) =  11.71
 TOTAL STREAM AREA(ACRES) =     0.63
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.27

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 4A.1                                                    |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
 FLOW PROCESS FROM NODE     10.00 TO NODE     11.00 IS CODE =  21
----------------------------------------------------------------------------
```

```
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    60.00
  UPSTREAM ELEVATION(FEET) =   1364.50
  DOWNSTREAM ELEVATION(FEET) =   1363.60
  ELEVATION DIFFERENCE(FEET) =      0.90
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.167
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.20
  TOTAL AREA(ACRES) =      0.02   TOTAL RUNOFF(CFS) =      0.20

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 4A.2                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     11.00 TO NODE     12.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
==============================================================================
  REPRESENTATIVE SLOPE =  0.0050
  CHANNEL LENGTH THRU SUBAREA(FEET) =   168.00
  "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.100
  PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   0.50
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      2.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.64
  AVERAGE FLOW DEPTH(FEET) =   0.25   FLOOD WIDTH(FEET) =   16.79
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.70   Tc(MIN.) =    4.87
  SUBAREA AREA(ACRES) =    0.47       SUBAREA RUNOFF(CFS) =    4.68
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.840
  TOTAL AREA(ACRES) =        0.5         PEAK FLOW RATE(CFS) =       4.88

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.30   FLOOD WIDTH(FEET) =   22.27
  FLOW VELOCITY(FEET/SEC.) =   1.87   DEPTH*VELOCITY(FT*FT/SEC) =   0.56
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE     12.00 =     228.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     12.00 TO NODE    401.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  REPRESENTATIVE SLOPE =  0.0120
  FLOW LENGTH(FEET) =     8.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   9.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.35
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.88
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =    4.89
  LONGEST FLOWPATH FROM NODE     10.00 TO NODE    401.00 =     236.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    401.00 TO NODE    401.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
```

```
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    4.89
  RAINFALL INTENSITY(INCH/HR) =  11.86
  TOTAL STREAM AREA(ACRES) =     0.49
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.88

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        6.27     5.10       11.709          0.63
      2        4.88     4.89       11.856          0.49

  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       11.08     4.89      11.856
      2       11.09     5.10      11.709

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      11.09   Tc(MIN.) =    5.10
  TOTAL AREA(ACRES) =        1.1
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE    401.00 =     436.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    401.00 TO NODE    404.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0050
  FLOW LENGTH(FEET) =    89.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  16.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.45
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.09
  PIPE TRAVEL TIME(MIN.) =   0.27    Tc(MIN.) =    5.37
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE    404.00 =     525.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    404.00 TO NODE    404.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 5A                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     13.00 TO NODE     14.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    47.00
  UPSTREAM ELEVATION(FEET) =   1364.30
  DOWNSTREAM ELEVATION(FEET) =   1363.00
  ELEVATION DIFFERENCE(FEET) =      1.30
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.286
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.30
  TOTAL AREA(ACRES) =      0.03   TOTAL RUNOFF(CFS) =      0.30
```

```
****************************************************************************
  FLOW PROCESS FROM NODE     14.00 TO NODE    402.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0050
  FLOW LENGTH(FEET) =    60.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   6.0 INCH PIPE IS   3.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   2.28
  ESTIMATED PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.30
  PIPE TRAVEL TIME(MIN.) =   0.44    Tc(MIN.) =    2.72
  LONGEST FLOWPATH FROM NODE     13.00 TO NODE    402.00 =     107.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    402.00 TO NODE    402.00 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.) =    2.72
  RAINFALL INTENSITY(INCH/HR) =  11.86
  TOTAL STREAM AREA(ACRES) =     0.03
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.30

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 6A                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     15.00 TO NODE    402.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    64.00
  UPSTREAM ELEVATION(FEET) =   1364.50
  DOWNSTREAM ELEVATION(FEET) =   1363.50
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.227
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.20
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      1.20

****************************************************************************
  FLOW PROCESS FROM NODE    402.00 TO NODE    402.00 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.) =    3.23
  RAINFALL INTENSITY(INCH/HR) =  11.86
  TOTAL STREAM AREA(ACRES) =     0.12
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.20

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        0.30     2.72       11.856          0.03
      2        1.20     3.23       11.856          0.12
```

```
  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        1.31     2.72      11.856
      2        1.49     3.23      11.856

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       1.49   Tc(MIN.) =    3.23
  TOTAL AREA(ACRES) =        0.1
  LONGEST FLOWPATH FROM NODE     13.00 TO NODE    402.00 =     107.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    402.00 TO NODE    403.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0220
  FLOW LENGTH(FEET) =    71.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   5.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.94
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.49
  PIPE TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =    3.43
  LONGEST FLOWPATH FROM NODE     13.00 TO NODE    403.00 =     178.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    403.00 TO NODE    403.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 3 <<<<<
============================================================================

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 7A.1                                                    |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     16.00 TO NODE     17.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    60.00
  UPSTREAM ELEVATION(FEET) =   1364.50
  DOWNSTREAM ELEVATION(FEET) =   1363.30
  ELEVATION DIFFERENCE(FEET) =      1.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.877
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.40
  TOTAL AREA(ACRES) =      0.04   TOTAL RUNOFF(CFS) =      0.40

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 7A.2                                                    |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     17.00 TO NODE     18.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0120
```

```
  CHANNEL LENGTH THRU SUBAREA(FEET) =    83.00
  "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.100
  PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   0.50
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      2.79
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.39
  AVERAGE FLOW DEPTH(FEET) =   0.22   FLOOD WIDTH(FEET) =   14.35
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.58   Tc(MIN.) =    3.46
  SUBAREA AREA(ACRES) =    0.48       SUBAREA RUNOFF(CFS) =    4.78
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.840
  TOTAL AREA(ACRES) =        0.5         PEAK FLOW RATE(CFS) =       5.18

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.27   FLOOD WIDTH(FEET) =   19.07
  FLOW VELOCITY(FEET/SEC.) =   2.65   DEPTH*VELOCITY(FT*FT/SEC) =   0.72
  LONGEST FLOWPATH FROM NODE     16.00 TO NODE     18.00 =     143.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     18.00 TO NODE    403.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0050
  FLOW LENGTH(FEET) =    75.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.64
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.18
  PIPE TRAVEL TIME(MIN.) =   0.27    Tc(MIN.) =    3.72
  LONGEST FLOWPATH FROM NODE     16.00 TO NODE    403.00 =     218.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    403.00 TO NODE    403.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 3 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER       (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1         5.18     3.72      11.856        0.52
  LONGEST FLOWPATH FROM NODE     16.00 TO NODE    403.00 =     218.00 FEET.

  ** MEMORY BANK #  3 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER       (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1         1.49     3.43      11.856        0.15
  LONGEST FLOWPATH FROM NODE     13.00 TO NODE    403.00 =     178.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1       6.26       3.43       11.856
      2       6.67       3.72       11.856

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       6.67   Tc(MIN.) =    3.72
  TOTAL AREA(ACRES) =        0.7

****************************************************************************
  FLOW PROCESS FROM NODE    403.00 TO NODE    403.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 3 <<<<<
============================================================================
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    403.00 TO NODE    403.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0600
  FLOW LENGTH(FEET) =    13.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  12.51
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.67
  PIPE TRAVEL TIME(MIN.) =   0.02    Tc(MIN.) =    3.74
  LONGEST FLOWPATH FROM NODE     16.00 TO NODE    403.00 =     231.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    404.00 TO NODE    404.00 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         6.67      3.74       11.856         0.67
  LONGEST FLOWPATH FROM NODE     16.00 TO NODE    404.00 =     231.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF       Tc       INTENSITY     AREA
  NUMBER       (CFS)     (MIN.)    (INCH/HOUR)    (ACRE)
      1        11.09      5.37       11.323         1.12
  LONGEST FLOWPATH FROM NODE      4.00 TO NODE    404.00 =     525.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc       INTENSITY
  NUMBER      (CFS)     (MIN.)    (INCH/HOUR)
      1       14.40       3.74       11.856
      2       17.47       5.37       11.323

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      17.47   Tc(MIN.) =    5.37
  TOTAL AREA(ACRES) =        1.8

****************************************************************************
  FLOW PROCESS FROM NODE    404.00 TO NODE    404.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 8A                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     19.00 TO NODE     20.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  URBAN NEWLY GRADED AREAS RUNOFF COEFFICIENT = .6900
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  91
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    81.00
  UPSTREAM ELEVATION(FEET) =   1363.70
  DOWNSTREAM ELEVATION(FEET) =   1358.10
  ELEVATION DIFFERENCE(FEET) =      5.60
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.487
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
```

```
  SUBAREA RUNOFF(CFS) =      0.65
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.65

+---------------------------------------------------------------------------+
| DRAINAGE SUBAREA 9A.1                                                     |
|                                                                           |
|                                                                           |
+---------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     21.00 TO NODE     22.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1404.00
  DOWNSTREAM ELEVATION(FEET) =   1399.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    8.422
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.470
  SUBAREA RUNOFF(CFS) =      1.02
  TOTAL AREA(ACRES) =      0.40   TOTAL RUNOFF(CFS) =      1.02

+---------------------------------------------------------------------------+
| DRAINAGE SUBAREA 9A.2                                                     |
|                                                                           |
|                                                                           |
+---------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     22.00 TO NODE     23.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   550.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0550
  CHANNEL BASE(FEET) =   60.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.923
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       4.29
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.47
  AVERAGE FLOW DEPTH(FEET) =   0.05   TRAVEL TIME(MIN.) =   6.24
  Tc(MIN.) =   14.66
  SUBAREA AREA(ACRES) =     3.57       SUBAREA RUNOFF(CFS) =    6.34
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.300
  TOTAL AREA(ACRES) =        4.0         PEAK FLOW RATE(CFS) =       7.05

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.06   FLOW VELOCITY(FEET/SEC.) =   1.84
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE     23.00 =     650.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     23.00 TO NODE    100.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0300
  FLOW LENGTH(FEET) =   278.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.84
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.05
  PIPE TRAVEL TIME(MIN.) =   0.47    Tc(MIN.) =   15.13
```

```
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE    100.00 =     928.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 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        7.05    15.13       5.804        3.97
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE    100.00 =     928.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1        0.88     8.61       8.353        0.15
  LONGEST FLOWPATH FROM NODE      1.00 TO NODE    100.00 =     293.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1       4.90       8.61        8.353
      2       7.67      15.13        5.804

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       7.67   Tc(MIN.) =   15.13
  TOTAL AREA(ACRES) =        4.1

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    100.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    100.00 TO NODE    101.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    35.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS   9.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.26
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.67
  PIPE TRAVEL TIME(MIN.) =   0.09    Tc(MIN.) =   15.23
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE    101.00 =     963.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    101.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.23
  RAINFALL INTENSITY(INCH/HR) =   5.78
  TOTAL STREAM AREA(ACRES) =     4.12
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.67

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 10A.1                                                   |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     24.00 TO NODE     25.00 IS CODE =  21
```

```
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .6900
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  92
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    64.00
  UPSTREAM ELEVATION(FEET) =   1359.00
  DOWNSTREAM ELEVATION(FEET) =   1357.60
  ELEVATION DIFFERENCE(FEET) =      1.40
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.548
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.25
  TOTAL AREA(ACRES) =      0.03   TOTAL RUNOFF(CFS) =      0.25

+------------------------------------------------------------------------------+
| DRAINAGE SUBAREA 10A.2                                                       |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+

********************************************************************************
  FLOW PROCESS FROM NODE     25.00 TO NODE    101.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =    71.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0270
  CHANNEL BASE(FEET) =   30.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 10.967
  STREETS & ROADS (DITCHES) RUNOFF COEFFICIENT = .6900
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  92
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.08
  AVERAGE FLOW DEPTH(FEET) =   0.02   TRAVEL TIME(MIN.) =   1.09
  Tc(MIN.) =    5.64
  SUBAREA AREA(ACRES) =     0.09       SUBAREA RUNOFF(CFS) =    0.68
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.690
  TOTAL AREA(ACRES) =        0.1         PEAK FLOW RATE(CFS) =       0.91

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.03   FLOW VELOCITY(FEET/SEC.) =   1.18
  LONGEST FLOWPATH FROM NODE     24.00 TO NODE    101.00 =     135.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE    101.00 TO NODE    101.00 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.) =    5.64
  RAINFALL INTENSITY(INCH/HR) =  10.97
  TOTAL STREAM AREA(ACRES) =     0.12
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.91

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        7.67    15.23        5.781          4.12
      2        0.91     5.64       10.967          0.12

  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        3.75     5.64      10.967
      2        8.15    15.23       5.781

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       8.15   Tc(MIN.) =   15.23
  TOTAL AREA(ACRES) =        4.2
  LONGEST FLOWPATH FROM NODE     21.00 TO NODE    101.00 =     963.00 FEET.

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1B                                                        |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     31.00 TO NODE     32.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    36.00
  UPSTREAM ELEVATION(FEET) =   1364.30
  DOWNSTREAM ELEVATION(FEET) =   1363.90
  ELEVATION DIFFERENCE(FEET) =      0.40
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.711
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.50
  TOTAL AREA(ACRES) =      0.05   TOTAL RUNOFF(CFS) =      0.50

****************************************************************************
  FLOW PROCESS FROM NODE     32.00 TO NODE     33.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    94.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN   6.0 INCH PIPE IS   4.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   3.31
  GIVEN PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.50
  PIPE TRAVEL TIME(MIN.) =   0.47    Tc(MIN.) =    3.18
  LONGEST FLOWPATH FROM NODE     31.00 TO NODE     33.00 =     130.00 FEET.

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2B                                                        |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     33.00 TO NODE     33.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8400
  SUBAREA AREA(ACRES) =    0.05   SUBAREA RUNOFF(CFS) =    0.50
  TOTAL AREA(ACRES) =        0.1   TOTAL RUNOFF(CFS) =       1.00
  TC(MIN.) =    3.18

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

```
 FLOW PROCESS FROM NODE     33.00 TO NODE    200.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0640
 FLOW LENGTH(FEET) =    13.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN   6.0 INCH PIPE IS   3.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.98
 GIVEN PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.00
 PIPE TRAVEL TIME(MIN.) =   0.03    Tc(MIN.) =    3.21
 LONGEST FLOWPATH FROM NODE     31.00 TO NODE    200.00 =     143.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    200.00 TO NODE     34.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0180
 FLOW LENGTH(FEET) =    99.00   MANNING'S N =  0.012
 ASSUME FULL-FLOWING PIPELINE
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.07
 PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
 GIVEN PIPE DIAMETER(INCH) =   6.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.00
 PIPE TRAVEL TIME(MIN.) =   0.33    Tc(MIN.) =    3.54
 LONGEST FLOWPATH FROM NODE     31.00 TO NODE     34.00 =     242.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     34.00 TO NODE     36.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =    12.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0170
 CHANNEL BASE(FEET) =    6.00   "Z" FACTOR =   0.000
 MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
 CHANNEL FLOW THRU SUBAREA(CFS) =       1.00
 FLOW VELOCITY(FEET/SEC.) =   2.26   FLOW DEPTH(FEET) =   0.07
 TRAVEL TIME(MIN.) =   0.09   Tc(MIN.) =    3.63
 LONGEST FLOWPATH FROM NODE     31.00 TO NODE     36.00 =     254.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     36.00 TO NODE     36.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =    3.63
 RAINFALL INTENSITY(INCH/HR) =  11.86
 TOTAL STREAM AREA(ACRES) =     0.10
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.00

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 3B                                                        |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
 FLOW PROCESS FROM NODE     35.00 TO NODE     36.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  96
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    89.00
  UPSTREAM ELEVATION(FEET) =   1364.10
  DOWNSTREAM ELEVATION(FEET) =   1358.00
  ELEVATION DIFFERENCE(FEET) =      6.10
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.324
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.40
  TOTAL AREA(ACRES) =      0.04   TOTAL RUNOFF(CFS) =      0.40

****************************************************************************
  FLOW PROCESS FROM NODE     36.00 TO NODE     36.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    2.32
  RAINFALL INTENSITY(INCH/HR) =  11.86
  TOTAL STREAM AREA(ACRES) =     0.04
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.40

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        1.00     3.63       11.856          0.10
      2        0.40     2.32       11.856          0.04

  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        1.04     2.32      11.856
      2        1.39     3.63      11.856

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       1.39   Tc(MIN.) =    3.63
  TOTAL AREA(ACRES) =        0.1
  LONGEST FLOWPATH FROM NODE     31.00 TO NODE     36.00 =     254.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     36.00 TO NODE    201.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =     1.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   4.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.59
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.39
  PIPE TRAVEL TIME(MIN.) =   0.00    Tc(MIN.) =    3.63
  LONGEST FLOWPATH FROM NODE     31.00 TO NODE    201.00 =     255.00 FEET.

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 4B                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     37.00 TO NODE     38.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
```

```
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    49.00
  UPSTREAM ELEVATION(FEET) =   1363.00
  DOWNSTREAM ELEVATION(FEET) =   1362.20
  ELEVATION DIFFERENCE(FEET) =      0.80
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.782
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.10
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      1.10

****************************************************************************
  FLOW PROCESS FROM NODE     38.00 TO NODE    202.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    64.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   4.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.07
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.10
  PIPE TRAVEL TIME(MIN.) =   0.26    Tc(MIN.) =    3.04
  LONGEST FLOWPATH FROM NODE     37.00 TO NODE    202.00 =     113.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    202.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    3.04
  RAINFALL INTENSITY(INCH/HR) =  11.86
  TOTAL STREAM AREA(ACRES) =     0.11
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.10

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 5B                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     39.00 TO NODE     40.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    54.00
  UPSTREAM ELEVATION(FEET) =   1364.30
  DOWNSTREAM ELEVATION(FEET) =   1362.00
  ELEVATION DIFFERENCE(FEET) =      2.30
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.122
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.60
  TOTAL AREA(ACRES) =      0.06   TOTAL RUNOFF(CFS) =      0.60

****************************************************************************
  FLOW PROCESS FROM NODE     40.00 TO NODE    202.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0380
  FLOW LENGTH(FEET) =    15.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   2.3 INCHES
```

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.53
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.60
  PIPE TRAVEL TIME(MIN.) =   0.05    Tc(MIN.) =    2.17
  LONGEST FLOWPATH FROM NODE     39.00 TO NODE    202.00 =      69.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    202.00 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.) =    2.17
  RAINFALL INTENSITY(INCH/HR) =  11.86
  TOTAL STREAM AREA(ACRES) =     0.06
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.60

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        1.10     3.04       11.856          0.11
      2        0.60     2.17       11.856          0.06

  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        1.38     2.17      11.856
      2        1.69     3.04      11.856

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       1.69   Tc(MIN.) =    3.04
  TOTAL AREA(ACRES) =        0.2
  LONGEST FLOWPATH FROM NODE     37.00 TO NODE    202.00 =     113.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    202.00 TO NODE    203.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.1100
  FLOW LENGTH(FEET) =    54.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   3.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.88
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.69
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    3.13
  LONGEST FLOWPATH FROM NODE     37.00 TO NODE    203.00 =     167.00 FEET.

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 6B                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE    203.00 TO NODE    203.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8400
```

```
  SUBAREA AREA(ACRES) =    0.00   SUBAREA RUNOFF(CFS) =    0.05
  TOTAL AREA(ACRES) =        0.2   TOTAL RUNOFF(CFS) =       1.74
  TC(MIN.) =    3.13

+---------------------------------------------------------------------------+
| DRAINAGE SUBAREA 7B.1                                                     |
|                                                                           |
|                                                                           |
+---------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     42.00 TO NODE     43.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    80.00
  UPSTREAM ELEVATION(FEET) =   1361.10
  DOWNSTREAM ELEVATION(FEET) =   1358.60
  ELEVATION DIFFERENCE(FEET) =      2.50
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.863
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.80
  TOTAL AREA(ACRES) =      0.08   TOTAL RUNOFF(CFS) =      0.80

+---------------------------------------------------------------------------+
| DRAINAGE SUBAREA 7B.2                                                     |
|                                                                           |
|                                                                           |
+---------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     43.00 TO NODE     44.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =    36.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0360
  CHANNEL BASE(FEET) =    8.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.90
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.30
  AVERAGE FLOW DEPTH(FEET) =   0.05   TRAVEL TIME(MIN.) =   0.26
  Tc(MIN.) =    3.12
  SUBAREA AREA(ACRES) =     0.02       SUBAREA RUNOFF(CFS) =    0.20
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.840
  TOTAL AREA(ACRES) =        0.1         PEAK FLOW RATE(CFS) =       1.00

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.05   FLOW VELOCITY(FEET/SEC.) =   2.56
  LONGEST FLOWPATH FROM NODE     42.00 TO NODE     44.00 =     116.00 FEET.

+---------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1C.1                                                     |
|                                                                           |
|                                                                           |
+---------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     51.00 TO NODE     52.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
================================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1401.00
  DOWNSTREAM ELEVATION(FEET) =   1397.00
  ELEVATION DIFFERENCE(FEET) =      4.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    9.072
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  8.074
  SUBAREA RUNOFF(CFS) =      0.75
  TOTAL AREA(ACRES) =      0.31   TOTAL RUNOFF(CFS) =      0.75

+------------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1C.2                                                        |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+

********************************************************************************
  FLOW PROCESS FROM NODE     52.00 TO NODE     53.00 IS CODE =  51
--------------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
================================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   380.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0710
  CHANNEL BASE(FEET) =   60.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.277
  RESIDENTIAL (2. DU/AC OR LESS) RUNOFF COEFFICIENT = .4200
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  79
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       3.10
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.46
  AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   4.33
  Tc(MIN.) =   13.40
  SUBAREA AREA(ACRES) =     1.80       SUBAREA RUNOFF(CFS) =    4.75
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.402
  TOTAL AREA(ACRES) =        2.1         PEAK FLOW RATE(CFS) =       5.33

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.05   FLOW VELOCITY(FEET/SEC.) =   1.76
  LONGEST FLOWPATH FROM NODE     51.00 TO NODE     53.00 =     480.00 FEET.

+------------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1C.3                                                        |
|                                                                              |
|                                                                              |
+------------------------------------------------------------------------------+

********************************************************************************
  FLOW PROCESS FROM NODE     53.00 TO NODE     54.00 IS CODE =  91
--------------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
================================================================================
  REPRESENTATIVE SLOPE =  0.0260
  CHANNEL LENGTH THRU SUBAREA(FEET) =   385.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.090
  PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   0.50
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.821
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8300
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  92
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      6.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.86
  AVERAGE FLOW DEPTH(FEET) =   0.23   FLOOD WIDTH(FEET) =   17.58
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.66   Tc(MIN.) =   15.07
  SUBAREA AREA(ACRES) =    0.50       SUBAREA RUNOFF(CFS) =    2.42
```

```
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.484
  TOTAL AREA(ACRES) =        2.6         PEAK FLOW RATE(CFS) =       7.36

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.24   FLOOD WIDTH(FEET) =   18.52
  FLOW VELOCITY(FEET/SEC.) =   3.95   DEPTH*VELOCITY(FT*FT/SEC) =   0.93
  LONGEST FLOWPATH FROM NODE     51.00 TO NODE     54.00 =     865.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     54.00 TO NODE     55.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0130
  FLOW LENGTH(FEET) =   166.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS  11.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.03
  GIVEN PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.36
  PIPE TRAVEL TIME(MIN.) =   0.39    Tc(MIN.) =   15.46
  LONGEST FLOWPATH FROM NODE     51.00 TO NODE     55.00 =    1031.00 FEET.

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2C                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     55.00 TO NODE     55.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.725
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.5499
  SUBAREA AREA(ACRES) =    0.59   SUBAREA RUNOFF(CFS) =    2.84
  TOTAL AREA(ACRES) =        3.2   TOTAL RUNOFF(CFS) =      10.07
  TC(MIN.) =   15.46

****************************************************************************
  FLOW PROCESS FROM NODE     55.00 TO NODE     55.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 3C.1                                                    |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     56.00 TO NODE     57.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  ARTIICIAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .8700
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    90.00
  UPSTREAM ELEVATION(FEET) =   1370.50
  DOWNSTREAM ELEVATION(FEET) =   1365.90
  ELEVATION DIFFERENCE(FEET) =      4.60
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.280
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.41
```

```
  TOTAL AREA(ACRES) =      0.04   TOTAL RUNOFF(CFS) =      0.41

+-------------------------------------------------------------------------+
| DRAINAGE SUBAREA 3C.2                                                   |
|                                                                         |
|                                                                         |
+-------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     57.00 TO NODE     58.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  CHANNEL LENGTH THRU SUBAREA(FEET) =   297.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.090
  PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.20000
  MAXIMUM DEPTH(FEET) =   0.50
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      2.01
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.28
  AVERAGE FLOW DEPTH(FEET) =   0.16   FLOOD WIDTH(FEET) =    5.63
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.51   Tc(MIN.) =    3.79
  SUBAREA AREA(ACRES) =    0.32       SUBAREA RUNOFF(CFS) =    3.19
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.843
  TOTAL AREA(ACRES) =        0.4         PEAK FLOW RATE(CFS) =       3.60

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.21   FLOOD WIDTH(FEET) =    6.10
  FLOW VELOCITY(FEET/SEC.) =   4.06   DEPTH*VELOCITY(FT*FT/SEC) =   0.85
  LONGEST FLOWPATH FROM NODE     56.00 TO NODE     58.00 =     387.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     58.00 TO NODE    300.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0110
  FLOW LENGTH(FEET) =    34.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   9.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.56
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.60
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =    3.89
  LONGEST FLOWPATH FROM NODE     56.00 TO NODE    300.00 =     421.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE    300.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    3.89
  RAINFALL INTENSITY(INCH/HR) =  11.86
  TOTAL STREAM AREA(ACRES) =     0.36
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.60

+-------------------------------------------------------------------------+
| DRAINAGE SUBAREA 4C.1                                                   |
|                                                                         |
|                                                                         |
+-------------------------------------------------------------------------+

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

```
 FLOW PROCESS FROM NODE     59.00 TO NODE     60.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
 ARTIICIAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .8700
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  96
 INITIAL SUBAREA FLOW-LENGTH(FEET) =    60.00
 UPSTREAM ELEVATION(FEET) =   1370.50
 DOWNSTREAM ELEVATION(FEET) =   1365.40
 ELEVATION DIFFERENCE(FEET) =      5.10
 SUBAREA OVERLAND TIME OF FLOW(MIN.) =    1.571
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 SUBAREA RUNOFF(CFS) =      0.31
 TOTAL AREA(ACRES) =      0.03   TOTAL RUNOFF(CFS) =      0.31

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 4C.2                                                    |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
 FLOW PROCESS FROM NODE     60.00 TO NODE     61.00 IS CODE =  51
----------------------------------------------------------------------------
 >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
 >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
 CHANNEL LENGTH THRU SUBAREA(FEET) =    70.00
 REPRESENTATIVE CHANNEL SLOPE =  0.0900
 CHANNEL BASE(FEET) =    3.00   "Z" FACTOR =   0.330
 MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
 NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
 ARTIICIAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .8700
 SOIL CLASSIFICATION IS "C"
 S.C.S. CURVE NUMBER (AMC II) =  96
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.36
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   3.40
 AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   0.34
 Tc(MIN.) =    1.91
 SUBAREA AREA(ACRES) =     0.01       SUBAREA RUNOFF(CFS) =    0.10
 AREA-AVERAGE RUNOFF COEFFICIENT =  0.870
 TOTAL AREA(ACRES) =        0.0         PEAK FLOW RATE(CFS) =       0.41

 END OF SUBAREA CHANNEL FLOW HYDRAULICS:
 DEPTH(FEET) =  0.04   FLOW VELOCITY(FEET/SEC.) =   3.34
 LONGEST FLOWPATH FROM NODE     59.00 TO NODE     61.00 =     130.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE     61.00 TO NODE    300.00 IS CODE =  41
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0100
 FLOW LENGTH(FEET) =    27.00   MANNING'S N =  0.012
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   2.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   3.10
 GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       0.41
 PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =    2.06
 LONGEST FLOWPATH FROM NODE     59.00 TO NODE    300.00 =     157.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    300.00 TO NODE    300.00 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.) =    2.06
  RAINFALL INTENSITY(INCH/HR) =  11.86
  TOTAL STREAM AREA(ACRES) =     0.04
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.41

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        3.60     3.89       11.856         0.36
      2        0.41     2.06       11.856         0.04

  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        2.32     2.06      11.856
      2        4.01     3.89      11.856

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       4.01   Tc(MIN.) =    3.89
  TOTAL AREA(ACRES) =        0.4
  LONGEST FLOWPATH FROM NODE     56.00 TO NODE    300.00 =     421.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    300.00 TO NODE     55.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0220
  FLOW LENGTH(FEET) =    64.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   6.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.61
  GIVEN PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.01
  PIPE TRAVEL TIME(MIN.) =   0.14    Tc(MIN.) =    4.03
  LONGEST FLOWPATH FROM NODE     56.00 TO NODE     55.00 =     485.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     55.00 TO NODE     55.00 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        4.01     4.03      11.856        0.40
  LONGEST FLOWPATH FROM NODE     56.00 TO NODE     55.00 =     485.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
      1       10.07    15.46       5.725        3.20
  LONGEST FLOWPATH FROM NODE     51.00 TO NODE     55.00 =    1031.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1       6.64       4.03       11.856
      2      12.01      15.46        5.725

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      12.01   Tc(MIN.) =   15.46
  TOTAL AREA(ACRES) =        3.6

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

```
  FLOW PROCESS FROM NODE     55.00 TO NODE     55.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE     55.00 TO NODE     62.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0150
  FLOW LENGTH(FEET) =   173.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.48
  GIVEN PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      12.01
  PIPE TRAVEL TIME(MIN.) =   0.34    Tc(MIN.) =   15.80
  LONGEST FLOWPATH FROM NODE     51.00 TO NODE     62.00 =    1204.00 FEET.

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 5C                                                      |
|                                                                          |
|                                                                          |
+--------------------------------------------------------------------------+

****************************************************************************
  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) =  5.645
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6108
  SUBAREA AREA(ACRES) =    0.44   SUBAREA RUNOFF(CFS) =    2.09
  TOTAL AREA(ACRES) =        4.0   TOTAL RUNOFF(CFS) =      13.93
  TC(MIN.) =   15.80

****************************************************************************
  FLOW PROCESS FROM NODE     62.00 TO NODE     66.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    84.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  13.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.73
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      13.93
  PIPE TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =   15.98
  LONGEST FLOWPATH FROM NODE     51.00 TO NODE     66.00 =    1288.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     66.00 TO NODE     66.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   15.98
  RAINFALL INTENSITY(INCH/HR) =   5.60
  TOTAL STREAM AREA(ACRES) =     4.04
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     13.93

+--------------------------------------------------------------------------+
| DRAINAGE SUBAREA 6C.1                                                    |
|                                                                          |
|                                                                          |
```

```
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     63.00 TO NODE     64.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    53.00
  UPSTREAM ELEVATION(FEET) =   1359.30
  DOWNSTREAM ELEVATION(FEET) =   1358.70
  ELEVATION DIFFERENCE(FEET) =      0.60
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    3.269
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      1.10
  TOTAL AREA(ACRES) =      0.11   TOTAL RUNOFF(CFS) =      1.10

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 6C.2                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     64.00 TO NODE     65.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0110
  CHANNEL LENGTH THRU SUBAREA(FEET) =   188.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.090
  PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   0.50
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      2.84
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.33
  AVERAGE FLOW DEPTH(FEET) =   0.20   FLOOD WIDTH(FEET) =   14.61
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.34   Tc(MIN.) =    4.61
  SUBAREA AREA(ACRES) =    0.35       SUBAREA RUNOFF(CFS) =    3.49
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.840
  TOTAL AREA(ACRES) =        0.5         PEAK FLOW RATE(CFS) =       4.58

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.23   FLOOD WIDTH(FEET) =   18.05
  FLOW VELOCITY(FEET/SEC.) =   2.58   DEPTH*VELOCITY(FT*FT/SEC) =   0.59
  LONGEST FLOWPATH FROM NODE     63.00 TO NODE     65.00 =     241.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     65.00 TO NODE     66.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0150
  FLOW LENGTH(FEET) =   105.00   MANNING'S N =  0.012
  ASSUME FULL-FLOWING PIPELINE
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.83
  PIPE FLOW VELOCITY = (TOTAL FLOW)/(PIPE CROSS SECTION AREA)
  GIVEN PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.58
  PIPE TRAVEL TIME(MIN.) =   0.30    Tc(MIN.) =    4.91
  LONGEST FLOWPATH FROM NODE     63.00 TO NODE     66.00 =     346.00 FEET.
```

```
+-------------------------------------------------------------------------+
| DRAINAGE SUBAREA 7C                                                     |
|                                                                         |
|                                                                         |
+-------------------------------------------------------------------------+

**************************************************************************
  FLOW PROCESS FROM NODE     66.00 TO NODE     66.00 IS CODE =  81
--------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
==========================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8400
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  96
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.8400
  SUBAREA AREA(ACRES) =    0.24   SUBAREA RUNOFF(CFS) =    2.39
  TOTAL AREA(ACRES) =        0.7   TOTAL RUNOFF(CFS) =       6.97
  TC(MIN.) =    4.91

**************************************************************************
  FLOW PROCESS FROM NODE     66.00 TO NODE     66.00 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.) =    4.91
  RAINFALL INTENSITY(INCH/HR) =  11.86
  TOTAL STREAM AREA(ACRES) =     0.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.97

  ** CONFLUENCE DATA **
  STREAM     RUNOFF        Tc      INTENSITY      AREA
  NUMBER      (CFS)      (MIN.)   (INCH/HOUR)    (ACRE)
      1       13.93    15.98        5.603          4.04
      2        6.97     4.91       11.856          0.70

  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       11.25     4.91      11.856
      2       17.22    15.98       5.603

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      17.22   Tc(MIN.) =   15.98
  TOTAL AREA(ACRES) =        4.7
  LONGEST FLOWPATH FROM NODE     51.00 TO NODE     66.00 =    1288.00 FEET.

**************************************************************************
  FLOW PROCESS FROM NODE     66.00 TO NODE     67.00 IS CODE =  41
--------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
==========================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    76.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.10
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      17.22
  PIPE TRAVEL TIME(MIN.) =   0.16    Tc(MIN.) =   16.14
  LONGEST FLOWPATH FROM NODE     51.00 TO NODE     67.00 =    1364.00 FEET.

+-------------------------------------------------------------------------+
| DRAINAGE SUBAREA 8C                                                     |
```

```
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     67.00 TO NODE     67.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  5.568
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8300
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  92
  AREA-AVERAGE RUNOFF COEFFICIENT = 0.6567
  SUBAREA AREA(ACRES) =    0.33   SUBAREA RUNOFF(CFS) =    1.53
  TOTAL AREA(ACRES) =        5.1   TOTAL RUNOFF(CFS) =      18.54
  TC(MIN.) =   16.14

****************************************************************************
  FLOW PROCESS FROM NODE     67.00 TO NODE    301.00 IS CODE =  41
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING USER-SPECIFIED PIPESIZE (EXISTING ELEMENT)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0130
  FLOW LENGTH(FEET) =     6.00   MANNING'S N =  0.012
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  14.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.13
  GIVEN PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      18.54
  PIPE TRAVEL TIME(MIN.) =   0.01    Tc(MIN.) =   16.15
  LONGEST FLOWPATH FROM NODE     51.00 TO NODE    301.00 =    1370.00 FEET.

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 9C.1                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     68.00 TO NODE     69.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8300
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  92
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    60.00
  UPSTREAM ELEVATION(FEET) =   1356.20
  DOWNSTREAM ELEVATION(FEET) =   1355.00
  ELEVATION DIFFERENCE(FEET) =      1.20
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    2.988
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.20
  TOTAL AREA(ACRES) =      0.02   TOTAL RUNOFF(CFS) =      0.20

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 9C.2                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     69.00 TO NODE     70.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   129.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0080
```

```
  CHANNEL BASE(FEET) =    1.50   "Z" FACTOR =  13.090
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   0.50
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  LIMITED INDUSTRIAL RUNOFF COEFFICIENT = .8300
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  92
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       0.74
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.72
  AVERAGE FLOW DEPTH(FEET) =   0.13   TRAVEL TIME(MIN.) =   1.25
  Tc(MIN.) =    4.24
  SUBAREA AREA(ACRES) =     0.11       SUBAREA RUNOFF(CFS) =    1.08
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.830
  TOTAL AREA(ACRES) =        0.1         PEAK FLOW RATE(CFS) =       1.28

  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.17   FLOW VELOCITY(FEET/SEC.) =   2.01
  LONGEST FLOWPATH FROM NODE     68.00 TO NODE     70.00 =     189.00 FEET.

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1D.1                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     81.00 TO NODE     82.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1452.00
  DOWNSTREAM ELEVATION(FEET) =   1429.00
  ELEVATION DIFFERENCE(FEET) =     23.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    6.684
  WARNING: THE MAXIMUM OVERLAND FLOW SLOPE, 10.%, IS USED IN Tc CALCULATION!
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.832
  SUBAREA RUNOFF(CFS) =      1.68
  TOTAL AREA(ACRES) =      0.57   TOTAL RUNOFF(CFS) =      1.68

+----------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1D.2                                                      |
|                                                                            |
|                                                                            |
+----------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     82.00 TO NODE     83.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =   651.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0940
  CHANNEL BASE(FEET) =  100.00   "Z" FACTOR =   0.000
  MANNING'S FACTOR = 0.030   MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.482
  RESIDENTIAL (1. DU/AC OR LESS) RUNOFF COEFFICIENT = .2700
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  45
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =       6.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   1.79
  AVERAGE FLOW DEPTH(FEET) =   0.04   TRAVEL TIME(MIN.) =   6.07
  Tc(MIN.) =   12.75
  SUBAREA AREA(ACRES) =     5.18       SUBAREA RUNOFF(CFS) =    9.07
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.273
  TOTAL AREA(ACRES) =        5.8         PEAK FLOW RATE(CFS) =      10.17
```

```
  END OF SUBAREA CHANNEL FLOW HYDRAULICS:
  DEPTH(FEET) =  0.05   FLOW VELOCITY(FEET/SEC.) =   2.01
  LONGEST FLOWPATH FROM NODE     81.00 TO NODE     83.00 =     751.00 FEET.

+-------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1D.3                                                   |
|                                                                         |
|                                                                         |
+-------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     83.00 TO NODE     84.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0560
  CHANNEL LENGTH THRU SUBAREA(FEET) =   181.00
  "V" GUTTER WIDTH(FEET) =   3.00   GUTTER HIKE(FEET) =  0.800
  PAVEMENT LIP(FEET) =  0.010   MANNING'S N = .0150
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.20000
  MAXIMUM DEPTH(FEET) =   1.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  6.398
  RESIDENTIAL (4.3 DU/AC OR LESS) RUNOFF COEFFICIENT = .4800
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  81
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     10.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =  11.71
  AVERAGE FLOW DEPTH(FEET) =   0.80   FLOOD WIDTH(FEET) =    3.00
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.26   Tc(MIN.) =   13.01
  SUBAREA AREA(ACRES) =    0.10       SUBAREA RUNOFF(CFS) =    0.31
  AREA-AVERAGE RUNOFF COEFFICIENT =  0.277
  TOTAL AREA(ACRES) =        5.8         PEAK FLOW RATE(CFS) =      10.35

         NOTE:TRAVEL TIME ESTIMATES BASED ON NORMAL DEPTH
         IN A FLOWING-FULL GUTTER(NORMAL DEPTH = GUTTER HIKE)


  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  0.80   FLOOD WIDTH(FEET) =    3.00
  FLOW VELOCITY(FEET/SEC.) =  11.71   DEPTH*VELOCITY(FT*FT/SEC) =   9.37
  LONGEST FLOWPATH FROM NODE     81.00 TO NODE     84.00 =     932.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     84.00 TO NODE     86.00 IS CODE =  51
----------------------------------------------------------------------------
  >>>>>COMPUTE TRAPEZOIDAL CHANNEL FLOW<<<<<
  >>>>>TRAVELTIME THRU SUBAREA (EXISTING ELEMENT)<<<<<
============================================================================
  CHANNEL LENGTH THRU SUBAREA(FEET) =    41.00
  REPRESENTATIVE CHANNEL SLOPE =  0.0120
  CHANNEL BASE(FEET) =    4.00   "Z" FACTOR =   0.330
  MANNING'S FACTOR = 0.015   MAXIMUM DEPTH(FEET) =   1.00
  CHANNEL FLOW THRU SUBAREA(CFS) =      10.35
  FLOW VELOCITY(FEET/SEC.) =   5.60   FLOW DEPTH(FEET) =   0.45
  TRAVEL TIME(MIN.) =   0.12   Tc(MIN.) =   13.13
  LONGEST FLOWPATH FROM NODE     81.00 TO NODE     86.00 =     973.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE     86.00 TO NODE     86.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.13
  RAINFALL INTENSITY(INCH/HR) =   6.36
  TOTAL STREAM AREA(ACRES) =     5.85
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.35

+-------------------------------------------------------------------------+
| DRAINAGE SUBAREA 2D                                                     |
```

```
+------------------------------------------------------------------------+
|                                                                        |
|                                                                        |
+------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     85.00 TO NODE     86.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .3000
  SOIL CLASSIFICATION IS "C"
  S.C.S. CURVE NUMBER (AMC II) =  85
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    22.00
  UPSTREAM ELEVATION(FEET) =   1358.00
  DOWNSTREAM ELEVATION(FEET) =   1357.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    4.078
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) = 11.856
  NOTE: RAINFALL INTENSITY IS BASED ON Tc = 5-MINUTE.
  SUBAREA RUNOFF(CFS) =      0.43
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.43

****************************************************************************
  FLOW PROCESS FROM NODE     86.00 TO NODE     86.00 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.) =    4.08
  RAINFALL INTENSITY(INCH/HR) =  11.86
  TOTAL STREAM AREA(ACRES) =     0.12
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.43

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       10.35    13.13        6.360          5.85
      2        0.43     4.08       11.856          0.12

  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        3.64     4.08      11.856
      2       10.58    13.13       6.360

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      10.58   Tc(MIN.) =   13.13
  TOTAL AREA(ACRES) =        6.0
  LONGEST FLOWPATH FROM NODE     81.00 TO NODE     86.00 =     973.00 FEET.

+------------------------------------------------------------------------+
| DRAINAGE SUBAREA 1E                                                    |
|                                                                        |
|                                                                        |
+------------------------------------------------------------------------+

****************************************************************************
  FLOW PROCESS FROM NODE     91.00 TO NODE     92.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
  NATURAL DESERT LANDSCAPING RUNOFF COEFFICIENT = .2000
  SOIL CLASSIFICATION IS "A"
  S.C.S. CURVE NUMBER (AMC II) =  63
  INITIAL SUBAREA FLOW-LENGTH(FEET) =    86.00
  UPSTREAM ELEVATION(FEET) =   1358.00
```

```
  DOWNSTREAM ELEVATION(FEET) =   1351.10
  ELEVATION DIFFERENCE(FEET) =      6.90
  SUBAREA OVERLAND TIME OF FLOW(MIN.) =    7.505
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  9.124
  SUBAREA RUNOFF(CFS) =      0.22
  TOTAL AREA(ACRES) =      0.12   TOTAL RUNOFF(CFS) =      0.22
================================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =        0.1  TC(MIN.) =      7.50
  PEAK FLOW RATE(CFS)   =       0.22
================================================================================
================================================================================
  END OF RATIONAL METHOD ANALYSIS
```

APPENDIX E

Hydromodification Analysis

RATIONAL METHOD HYDROGRAPH PROGRAM

RUN DATE 5/19/2021
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 15 MIN.
6 HOUR RAINFALL 4.5 INCHES
BASIN AREA 6.03 ACRES
RUNOFF COEFFICIENT 0.33
PEAK DISCHARGE 11.63 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 15	DISCHARGE (CFS) = 0.5
TIME (MIN) = 30	DISCHARGE (CFS) = 0.6
TIME (MIN) = 45	DISCHARGE (CFS) = 0.6
TIME (MIN) = 60	DISCHARGE (CFS) = 0.6
TIME (MIN) = 75	DISCHARGE (CFS) = 0.7
TIME (MIN) = 90	DISCHARGE (CFS) = 0.7
TIME (MIN) = 105	DISCHARGE (CFS) = 0.7
TIME (MIN) = 120	DISCHARGE (CFS) = 0.8
TIME (MIN) = 135	DISCHARGE (CFS) = 0.9
TIME (MIN) = 150	DISCHARGE (CFS) = 0.9
TIME (MIN) = 165	DISCHARGE (CFS) = 1
TIME (MIN) = 180	DISCHARGE (CFS) = 1.1
TIME (MIN) = 195	DISCHARGE (CFS) = 1.4
TIME (MIN) = 210	DISCHARGE (CFS) = 1.6
TIME (MIN) = 225	DISCHARGE (CFS) = 2.3
TIME (MIN) = 240	DISCHARGE (CFS) = 3.2
TIME (MIN) = 255	DISCHARGE (CFS) = 11.63
TIME (MIN) = 270	DISCHARGE (CFS) = 1.8
TIME (MIN) = 285	DISCHARGE (CFS) = 1.2
TIME (MIN) = 300	DISCHARGE (CFS) = 1
TIME (MIN) = 315	DISCHARGE (CFS) = 0.8
TIME (MIN) = 330	DISCHARGE (CFS) = 0.7
TIME (MIN) = 345	DISCHARGE (CFS) = 0.6
TIME (MIN) = 360	DISCHARGE (CFS) = 0.6
TIME (MIN) = 375	DISCHARGE (CFS) = 0

RATIONAL METHOD HYDROGRAPH PROGRAM

RUN DATE 5/19/2021
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 5 MIN.
6 HOUR RAINFALL 4.5 INCHES
BASIN AREA 1.78 ACRES
RUNOFF COEFFICIENT 0.33
PEAK DISCHARGE 16.78 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 5	DISCHARGE (CFS) = 0.2
TIME (MIN) = 10	DISCHARGE (CFS) = 0.2
TIME (MIN) = 15	DISCHARGE (CFS) = 0.2
TIME (MIN) = 20	DISCHARGE (CFS) = 0.2
TIME (MIN) = 25	DISCHARGE (CFS) = 0.2
TIME (MIN) = 30	DISCHARGE (CFS) = 0.2
TIME (MIN) = 35	DISCHARGE (CFS) = 0.2
TIME (MIN) = 40	DISCHARGE (CFS) = 0.2
TIME (MIN) = 45	DISCHARGE (CFS) = 0.2
TIME (MIN) = 50	DISCHARGE (CFS) = 0.2
TIME (MIN) = 55	DISCHARGE (CFS) = 0.2
TIME (MIN) = 60	DISCHARGE (CFS) = 0.2
TIME (MIN) = 65	DISCHARGE (CFS) = 0.2
TIME (MIN) = 70	DISCHARGE (CFS) = 0.2
TIME (MIN) = 75	DISCHARGE (CFS) = 0.2
TIME (MIN) = 80	DISCHARGE (CFS) = 0.2
TIME (MIN) = 85	DISCHARGE (CFS) = 0.2
TIME (MIN) = 90	DISCHARGE (CFS) = 0.2
TIME (MIN) = 95	DISCHARGE (CFS) = 0.2
TIME (MIN) = 100	DISCHARGE (CFS) = 0.2
TIME (MIN) = 105	DISCHARGE (CFS) = 0.2
TIME (MIN) = 110	DISCHARGE (CFS) = 0.2
TIME (MIN) = 115	DISCHARGE (CFS) = 0.2
TIME (MIN) = 120	DISCHARGE (CFS) = 0.2
TIME (MIN) = 125	DISCHARGE (CFS) = 0.2
TIME (MIN) = 130	DISCHARGE (CFS) = 0.3
TIME (MIN) = 135	DISCHARGE (CFS) = 0.3
TIME (MIN) = 140	DISCHARGE (CFS) = 0.3
TIME (MIN) = 145	DISCHARGE (CFS) = 0.3
TIME (MIN) = 150	DISCHARGE (CFS) = 0.3
TIME (MIN) = 155	DISCHARGE (CFS) = 0.3
TIME (MIN) = 160	DISCHARGE (CFS) = 0.3
TIME (MIN) = 165	DISCHARGE (CFS) = 0.3
TIME (MIN) = 170	DISCHARGE (CFS) = 0.3
TIME (MIN) = 175	DISCHARGE (CFS) = 0.4
TIME (MIN) = 180	DISCHARGE (CFS) = 0.4
TIME (MIN) = 185	DISCHARGE (CFS) = 0.4
TIME (MIN) = 190	DISCHARGE (CFS) = 0.4
TIME (MIN) = 195	DISCHARGE (CFS) = 0.4
TIME (MIN) = 200	DISCHARGE (CFS) = 0.5
TIME (MIN) = 205	DISCHARGE (CFS) = 0.5
TIME (MIN) = 210	DISCHARGE (CFS) = 0.5
TIME (MIN) = 215	DISCHARGE (CFS) = 0.6
TIME (MIN) = 220	DISCHARGE (CFS) = 0.7
TIME (MIN) = 225	DISCHARGE (CFS) = 0.8
TIME (MIN) = 230	DISCHARGE (CFS) = 0.9
TIME (MIN) = 235	DISCHARGE (CFS) = 1.4
TIME (MIN) = 240	DISCHARGE (CFS) = -7.9
TIME (MIN) = 245	DISCHARGE (CFS) = 16.78
TIME (MIN) = 250	DISCHARGE (CFS) = 1.1
TIME (MIN) = 255	DISCHARGE (CFS) = 0.7
TIME (MIN) = 260	DISCHARGE (CFS) = 0.6
TIME (MIN) = 265	DISCHARGE (CFS) = 0.5
TIME (MIN) = 270	DISCHARGE (CFS) = 0.4
TIME (MIN) = 275	DISCHARGE (CFS) = 0.4
TIME (MIN) = 280	DISCHARGE (CFS) = 0.3
TIME (MIN) = 285	DISCHARGE (CFS) = 0.3
TIME (MIN) = 290	DISCHARGE (CFS) = 0.3
TIME (MIN) = 295	DISCHARGE (CFS) = 0.3
TIME (MIN) = 300	DISCHARGE (CFS) = 0.3
TIME (MIN) = 305	DISCHARGE (CFS) = 0.2
TIME (MIN) = 310	DISCHARGE (CFS) = 0.2
TIME (MIN) = 315	DISCHARGE (CFS) = 0.2
TIME (MIN) = 320	DISCHARGE (CFS) = 0.2
TIME (MIN) = 325	DISCHARGE (CFS) = 0.2
TIME (MIN) = 330	DISCHARGE (CFS) = 0.2
TIME (MIN) = 335	DISCHARGE (CFS) = 0.2
TIME (MIN) = 340	DISCHARGE (CFS) = 0.2
TIME (MIN) = 345	DISCHARGE (CFS) = 0.2
TIME (MIN) = 350	DISCHARGE (CFS) = 0.2
TIME (MIN) = 355	DISCHARGE (CFS) = 0.2
TIME (MIN) = 360	DISCHARGE (CFS) = 0.2
TIME (MIN) = 365	DISCHARGE (CFS) = 0

RATIONAL METHOD HYDROGRAPH PROGRAM

RUN DATE 5/19/2021
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 16 MIN.
6 HOUR RAINFALL 4.5 INCHES
BASIN AREA 5.16 ACRES
RUNOFF COEFFICIENT 0.65
PEAK DISCHARGE 18.58 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 16	DISCHARGE (CFS) = 0.9
TIME (MIN) = 32	DISCHARGE (CFS) = 1
TIME (MIN) = 48	DISCHARGE (CFS) = 1
TIME (MIN) = 64	DISCHARGE (CFS) = 1.1
TIME (MIN) = 80	DISCHARGE (CFS) = 1.1
TIME (MIN) = 96	DISCHARGE (CFS) = 1.2
TIME (MIN) = 112	DISCHARGE (CFS) = 1.2
TIME (MIN) = 128	DISCHARGE (CFS) = 1.4
TIME (MIN) = 144	DISCHARGE (CFS) = 1.5
TIME (MIN) = 160	DISCHARGE (CFS) = 1.7
TIME (MIN) = 176	DISCHARGE (CFS) = 1.8
TIME (MIN) = 192	DISCHARGE (CFS) = 2.2
TIME (MIN) = 208	DISCHARGE (CFS) = 2.5
TIME (MIN) = 224	DISCHARGE (CFS) = 3.7
TIME (MIN) = 240	DISCHARGE (CFS) = 5.4
TIME (MIN) = 256	DISCHARGE (CFS) = 18.58
TIME (MIN) = 272	DISCHARGE (CFS) = 3
TIME (MIN) = 288	DISCHARGE (CFS) = 2
TIME (MIN) = 304	DISCHARGE (CFS) = 1.6
TIME (MIN) = 320	DISCHARGE (CFS) = 1.3
TIME (MIN) = 336	DISCHARGE (CFS) = 1.1
TIME (MIN) = 352	DISCHARGE (CFS) = 1
TIME (MIN) = 368	DISCHARGE (CFS) = 0.9
TIME (MIN) = 384	DISCHARGE (CFS) = 0

RATIONAL METHOD HYDROGRAPH PROGRAM

RUN DATE 5/19/2021
HYDROGRAPH FILE NAME Text1
TIME OF CONCENTRATION 16 MIN.
6 HOUR RAINFALL 4.5 INCHES
BASIN AREA 5.08 ACRES
RUNOFF COEFFICIENT 0.66
PEAK DISCHARGE 18.54 CFS

TIME (MIN) = 0	DISCHARGE (CFS) = 0
TIME (MIN) = 16	DISCHARGE (CFS) = 0.9
TIME (MIN) = 32	DISCHARGE (CFS) = 1
TIME (MIN) = 48	DISCHARGE (CFS) = 1
TIME (MIN) = 64	DISCHARGE (CFS) = 1.1
TIME (MIN) = 80	DISCHARGE (CFS) = 1.1
TIME (MIN) = 96	DISCHARGE (CFS) = 1.2
TIME (MIN) = 112	DISCHARGE (CFS) = 1.2
TIME (MIN) = 128	DISCHARGE (CFS) = 1.4
TIME (MIN) = 144	DISCHARGE (CFS) = 1.5
TIME (MIN) = 160	DISCHARGE (CFS) = 1.7
TIME (MIN) = 176	DISCHARGE (CFS) = 1.8
TIME (MIN) = 192	DISCHARGE (CFS) = 2.2
TIME (MIN) = 208	DISCHARGE (CFS) = 2.5
TIME (MIN) = 224	DISCHARGE (CFS) = 3.7
TIME (MIN) = 240	DISCHARGE (CFS) = 5.5
TIME (MIN) = 256	DISCHARGE (CFS) = 18.54
TIME (MIN) = 272	DISCHARGE (CFS) = 3
TIME (MIN) = 288	DISCHARGE (CFS) = 2
TIME (MIN) = 304	DISCHARGE (CFS) = 1.6
TIME (MIN) = 320	DISCHARGE (CFS) = 1.3
TIME (MIN) = 336	DISCHARGE (CFS) = 1.1
TIME (MIN) = 352	DISCHARGE (CFS) = 1
TIME (MIN) = 368	DISCHARGE (CFS) = 0.9
TIME (MIN) = 384	DISCHARGE (CFS) = 0

Hydrograph Return Period Recap

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5

Hyd. No.	Hydrograph type (origin)	Inflow hyd(s)	Peak Outflow (cfs)							Hydrograph Description
			1-yr	2-yr	3-yr	5-yr	10-yr	25-yr	50-yr	100-yr	
1	Manual	------	-------	0.000	-------	-------	0.000	0.000	-------	11.63	DMA-A Exist 100-Yr
2	Manual	------	-------	0.000	-------	-------	0.000	0.000	-------	18.58	DMA-C Exist 100-Yr
4	Manual	------	-------	0.000	-------	-------	0.000	0.000	-------	16.78	DMA-A Prop 100-Yr to System #1
5	Manual	------	-------	0.000	-------	-------	0.000	0.000	-------	18.54	DMA-C Prop 100-Yr to System #2
7	Reservoir	4	-------	0.000	-------	-------	0.000	0.000	-------	0.442	System #1 (DMA-A)
8	Reservoir	5	-------	0.000	-------	-------	0.000	0.000	-------	13.68	System #2 (DMA-C)

Hydrograph Summary Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5

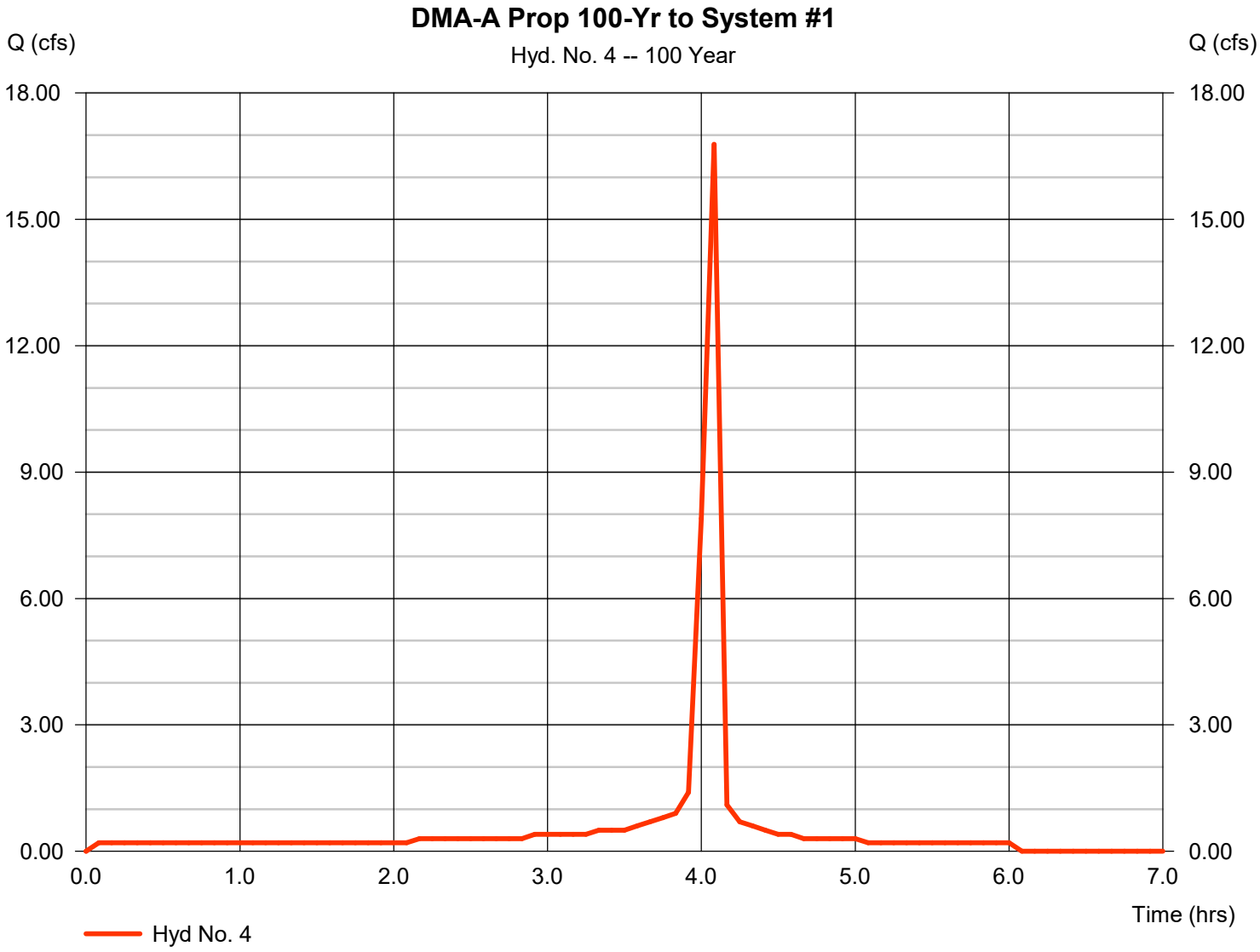
Hyd. No.	Hydrograph type (origin)	Peak flow (cfs)	Time interval (min)	Time to Peak (min)	Hyd. volume (cuft)	Inflow hyd(s)	Maximum elevation (ft)	Total strge used (cuft)	Hydrograph Description
1	Manual	11.63	15	255	32,337	------	------	------	DMA-A Exist 100-Yr
2	Manual	18.58	16	256	54,893	------	------	------	DMA-C Exist 100-Yr
4	Manual	16.78	5	245	14,364	------	------	------	DMA-A Prop 100-Yr to System #1
5	Manual	18.54	16	256	54,950	------	------	------	DMA-C Prop 100-Yr to System #2
7	Reservoir	0.442	5	270	14,348	4	103.63	10,263	System #1 (DMA-A)
8	Reservoir	13.68	16	256	54,942	5	105.00	9,280	System #2 (DMA-C)

Hydrograph Report

Hyd. No. 4

DMA-A Prop 100-Yr to System #1

Hydrograph type	= Manual	Peak discharge	= 16.78 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.08 hrs
Time interval	= 5 min	Hyd. volume	= 14,364 cuft

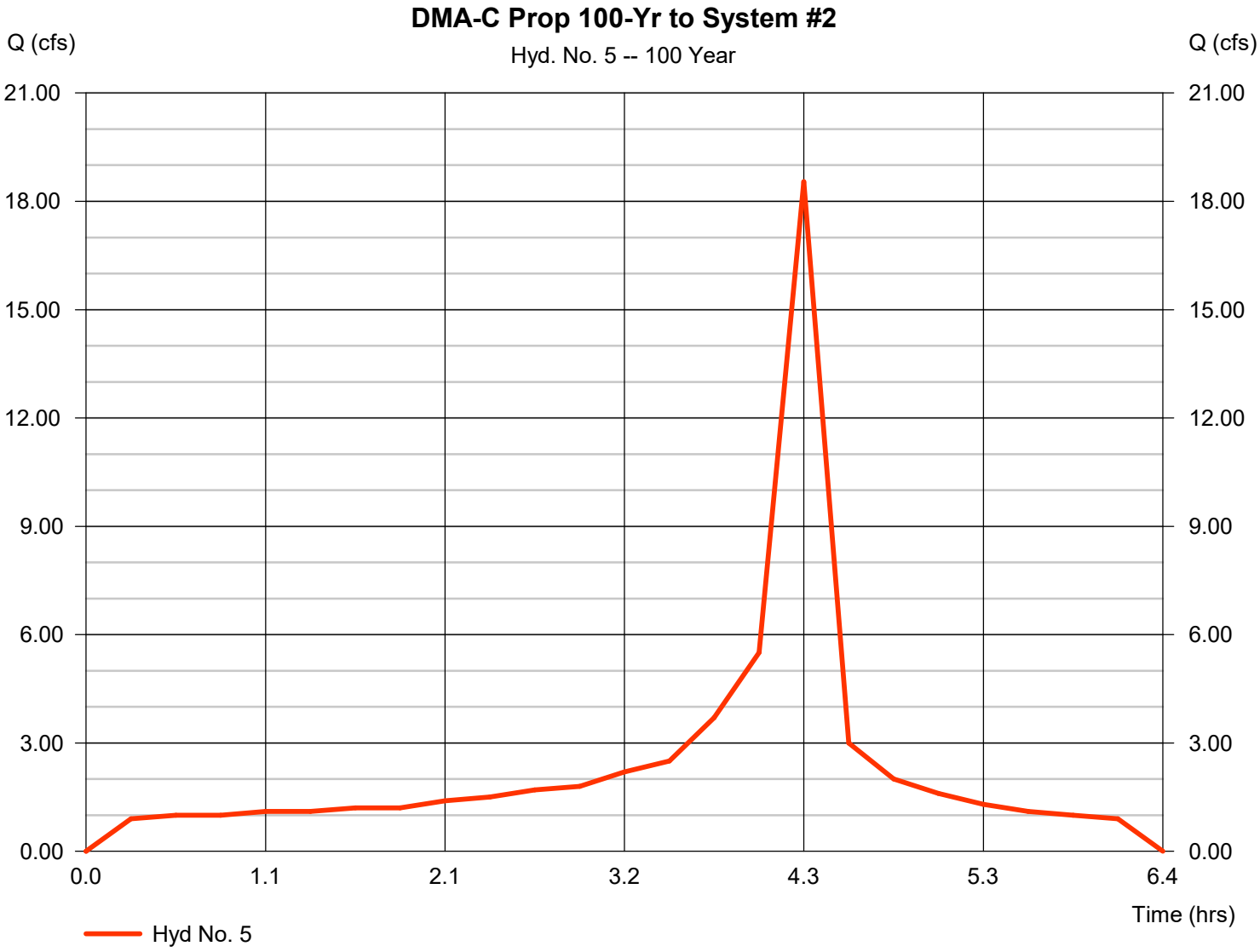


Hydrograph Report

Hyd. No. 5

DMA-C Prop 100-Yr to System #2

Hydrograph type	= Manual	Peak discharge	= 18.54 cfs
Storm frequency	= 100 yrs	Time to peak	= 4.27 hrs
Time interval	= 16 min	Hyd. volume	= 54,950 cuft



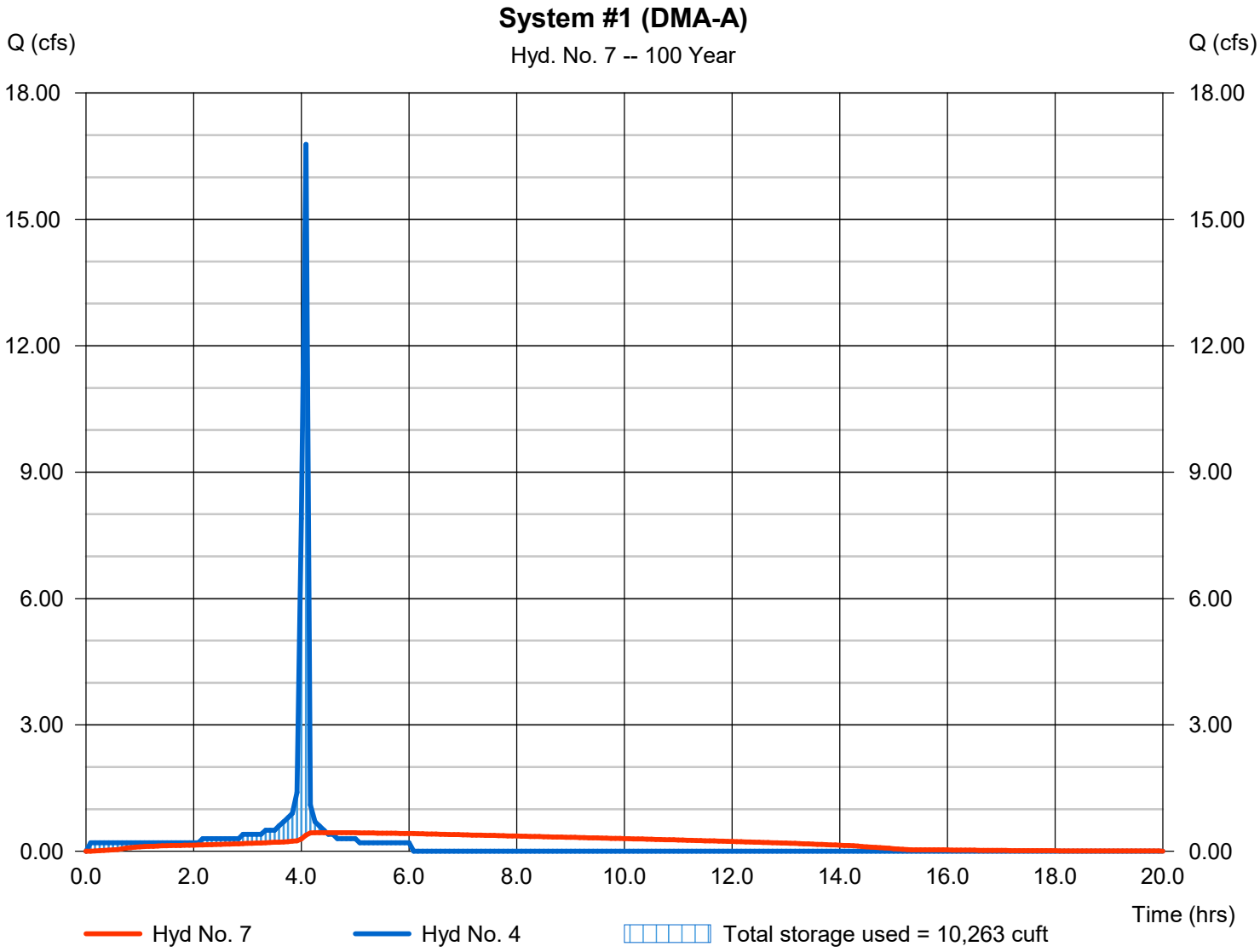
Hydrograph Report

Hyd. No. 7

System #1 (DMA-A)

Hydrograph type	=	Reservoir	Peak discharge	=	0.442 cfs
Storm frequency	=	100 yrs	Time to peak	=	4.50 hrs
Time interval	=	5 min	Hyd. volume	=	14,348 cuft
Inflow hyd. No.	=	4 - DMA-A Prop 100-Yr to System#1	Max. Elevation	=	103.63 ft
Reservoir name	=	System 1 (DMA-A)	Max. Storage	=	10,263 cuft

Storage Indication method used.



Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5 Tuesday, 05 / 25 / 2021

Pond No. 1 - System 1 (DMA-A)

Pond Data

UG Chambers -Invert elev. = 100.00 ft, Rise x Span = 5.00 x 5.00 ft, Barrel Len = 154.50 ft, No. Barrels = 4, Slope = 0.00%, Headers = Yes

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	n/a	0	0
0.50	100.50	n/a	688	688
1.00	101.00	n/a	1,195	1,883
1.50	101.50	n/a	1,453	3,336
2.00	102.00	n/a	1,601	4,937
2.50	102.50	n/a	1,673	6,610
3.00	103.00	n/a	1,672	8,282
3.50	103.50	n/a	1,601	9,883
4.00	104.00	n/a	1,453	11,336
4.50	104.50	n/a	1,194	12,530
5.00	105.00	n/a	687	13,217

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 3.00	Inactive	Inactive	Inactive
Span (in)	= 3.00	0.00	0.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 100.00	0.00	0.00	0.00
Length (ft)	= 4.00	0.00	0.00	0.00
Slope (%)	= 0.50	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

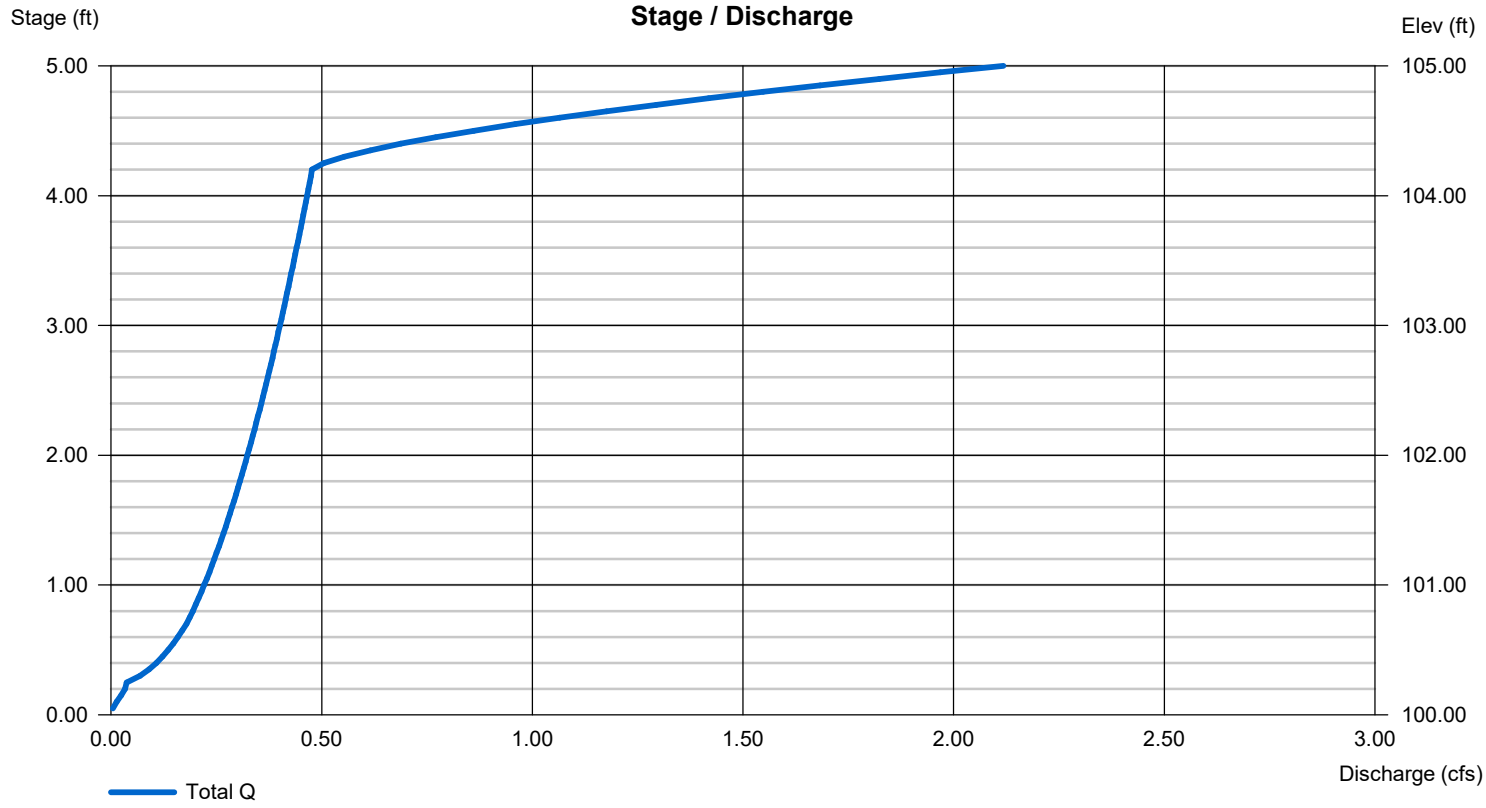
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.67	0.00	0.00	0.00
Crest El. (ft)	= 104.20	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



Pond Report

Pond No. 1 - System 1 (DMA-A)

Pond Data

UG Chambers -Invert elev. = 100.00 ft, Rise x Span = 5.00 x 5.00 ft, Barrel Len = 154.50 ft, No. Barrels = 4, Slope = 0.00%, Headers = Yes

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	n/a	0	0
0.50	100.50	n/a	688	688
1.00	101.00	n/a	1,195	1,883
1.50	101.50	n/a	1,453	3,336
2.00	102.00	n/a	1,601	4,937
2.50	102.50	n/a	1,673	6,610
3.00	103.00	n/a	1,672	8,282
3.50	103.50	n/a	1,601	9,883
4.00	104.00	n/a	1,453	11,336
4.50	104.50	n/a	1,194	12,530
5.00	105.00	n/a	687	13,217

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 3.00	Inactive	Inactive	Inactive
Span (in)	= 3.00	0.00	0.00	0.00
No. Barrels	= 1	1	1	0
Invert El. (ft)	= 100.00	0.00	0.00	0.00
Length (ft)	= 4.00	0.00	0.00	0.00
Slope (%)	= 0.50	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	Yes	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 0.67	0.00	0.00	0.00
Crest El. (ft)	= 104.20	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	100.00	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.50	688	100.50	0.14 oc	---	---	---	0.00	---	---	---	---	---	0.135
1.00	1,883	101.00	0.22 ic	---	---	---	0.00	---	---	---	---	---	0.221
1.50	3,336	101.50	0.28 ic	---	---	---	0.00	---	---	---	---	---	0.277
2.00	4,937	102.00	0.32 ic	---	---	---	0.00	---	---	---	---	---	0.324
2.50	6,610	102.50	0.36 ic	---	---	---	0.00	---	---	---	---	---	0.364
3.00	8,282	103.00	0.40 ic	---	---	---	0.00	---	---	---	---	---	0.401
3.50	9,883	103.50	0.43 ic	---	---	---	0.00	---	---	---	---	---	0.434
4.00	11,336	104.00	0.47 ic	---	---	---	0.00	---	---	---	---	---	0.465
4.50	12,530	104.50	0.49 ic	---	---	---	0.37	---	---	---	---	---	0.861
5.00	13,217	105.00	0.52 ic	---	---	---	1.60	---	---	---	---	---	2.118

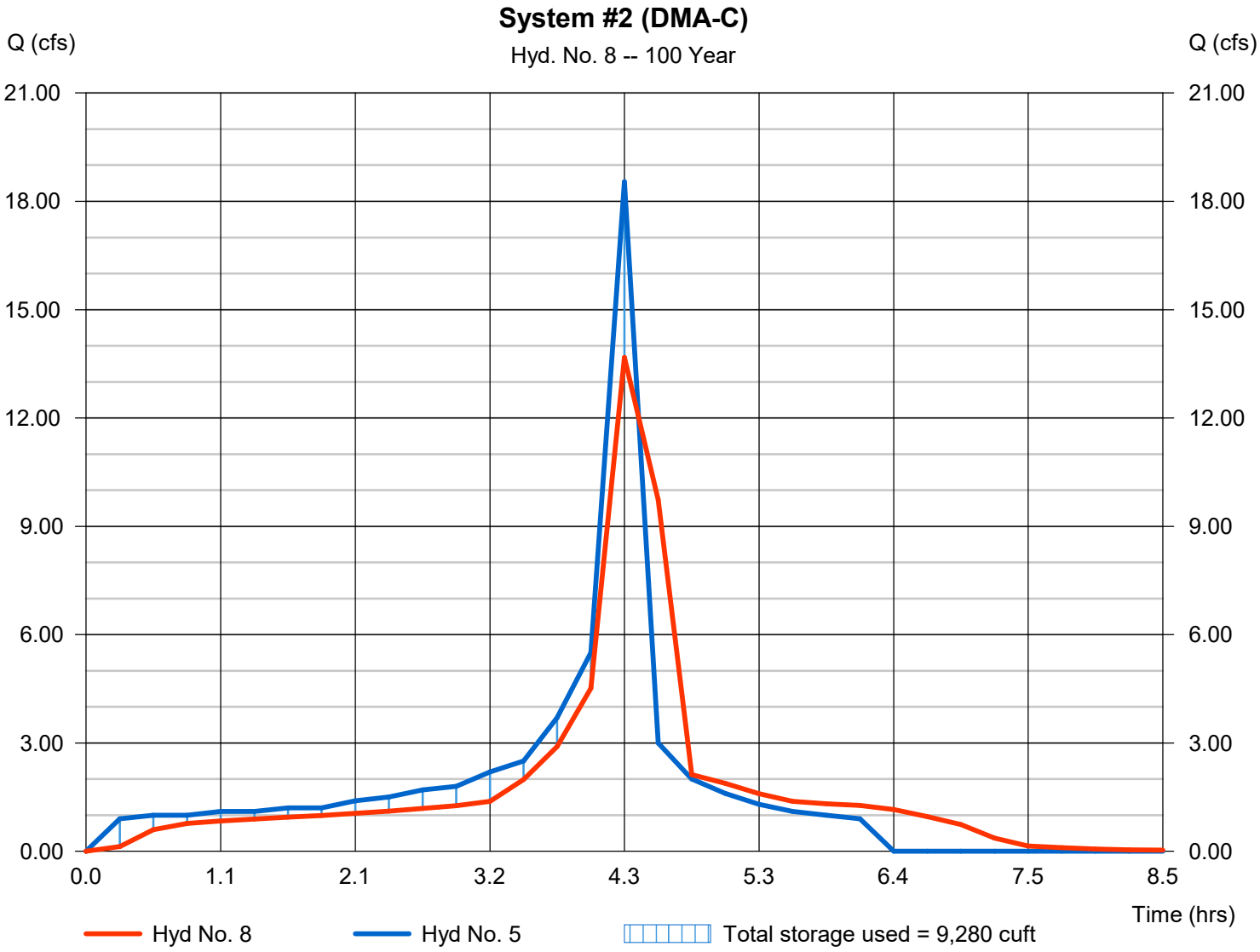
Hydrograph Report

Hyd. No. 8

System #2 (DMA-C)

Hydrograph type	=	Reservoir	Peak discharge	=	13.68 cfs
Storm frequency	=	100 yrs	Time to peak	=	4.27 hrs
Time interval	=	16 min	Hyd. volume	=	54,942 cuft
Inflow hyd. No.	=	5 - DMA-C Prop 100-Yr to System #2	Max. Elevation	=	105.00 ft
Reservoir name	=	System 2 (DMA-C)	Max. Storage	=	9,280 cuft

Storage Indication method used.



Pond Report

Pond No. 2 - System 2 (DMA-C)

Pond Data

UG Chambers -Invert elev. = 100.00 ft, Rise x Span = 5.00 x 5.00 ft, Barrel Len = 110.00 ft, No. Barrels = 4, Slope = 0.00%, Headers = Yes

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	n/a	0	0
0.50	100.50	n/a	506	506
1.00	101.00	n/a	879	1,385
1.50	101.50	n/a	1,069	2,454
2.00	102.00	n/a	1,177	3,631
2.50	102.50	n/a	1,230	4,862
3.00	103.00	n/a	1,230	6,092
3.50	103.50	n/a	1,177	7,269
4.00	104.00	n/a	1,069	8,337
4.50	104.50	n/a	878	9,216
5.00	105.00	n/a	505	9,721

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 6.00	Inactive	0.00	0.00
Span (in)	= 6.00	0.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 100.00	0.00	0.00	0.00
Length (ft)	= 4.00	0.00	0.00	0.00
Slope (%)	= 0.50	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

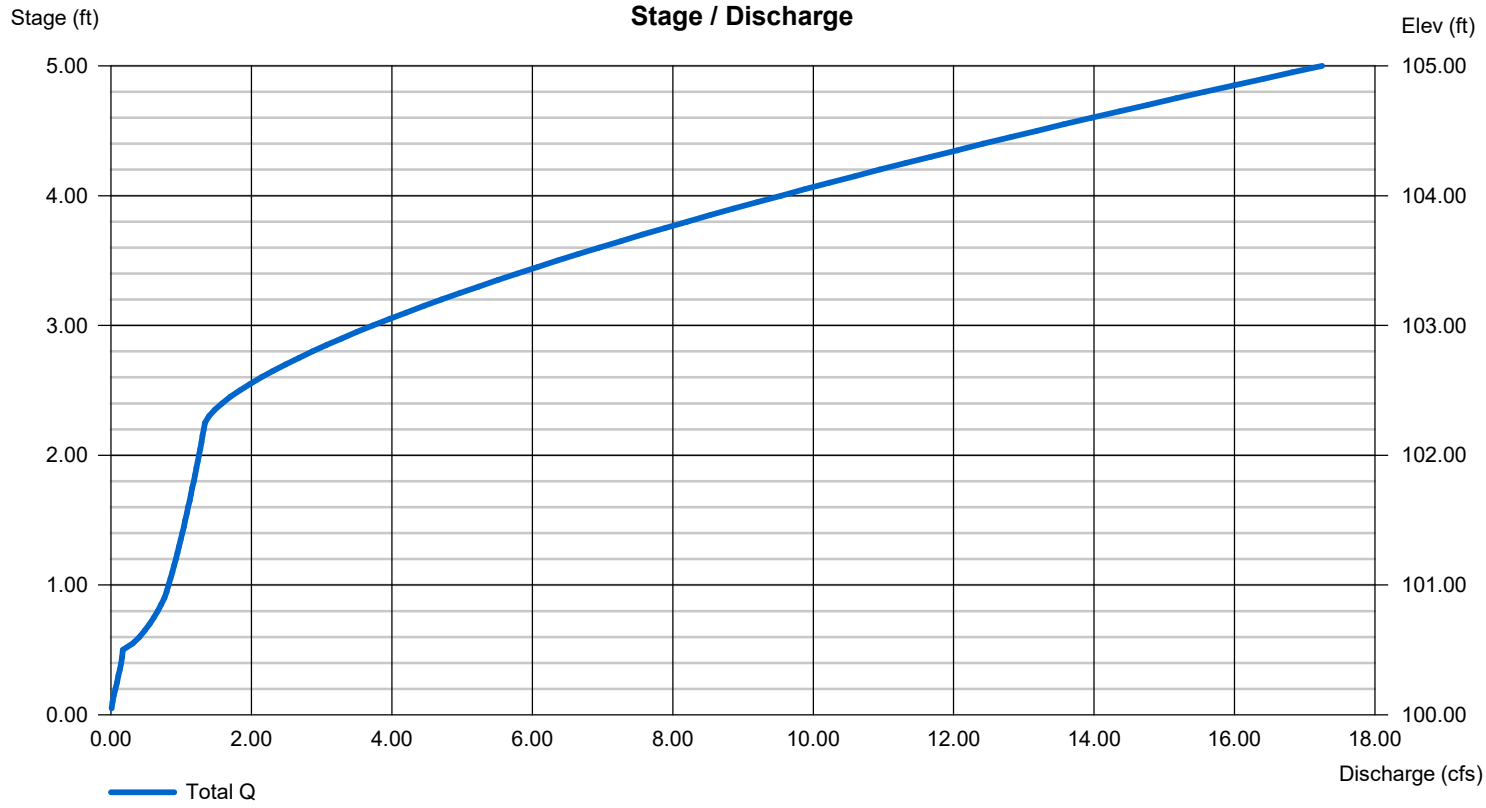
Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 1.00	0.00	0.00	0.00
Crest El. (ft)	= 102.25	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).



Pond Report

Hydraflow Hydrographs Extension for AutoCAD® Civil 3D® 2016 by Autodesk, Inc. v10.5 Wednesday, 05 / 19 / 2021

Pond No. 2 - System 2 (DMA-C)

Pond Data

UG Chambers -Invert elev. = 100.00 ft, Rise x Span = 5.00 x 5.00 ft, Barrel Len = 110.00 ft, No. Barrels = 4, Slope = 0.00%, Headers = Yes

Stage / Storage Table

Stage (ft)	Elevation (ft)	Contour area (sqft)	Incr. Storage (cuft)	Total storage (cuft)
0.00	100.00	n/a	0	0
0.50	100.50	n/a	506	506
1.00	101.00	n/a	879	1,385
1.50	101.50	n/a	1,069	2,454
2.00	102.00	n/a	1,177	3,631
2.50	102.50	n/a	1,230	4,862
3.00	103.00	n/a	1,230	6,092
3.50	103.50	n/a	1,177	7,269
4.00	104.00	n/a	1,069	8,337
4.50	104.50	n/a	878	9,216
5.00	105.00	n/a	505	9,721

Culvert / Orifice Structures

	[A]	[B]	[C]	[PrfRsr]
Rise (in)	= 6.00	Inactive	0.00	0.00
Span (in)	= 6.00	0.00	0.00	0.00
No. Barrels	= 1	1	0	0
Invert El. (ft)	= 100.00	0.00	0.00	0.00
Length (ft)	= 4.00	0.00	0.00	0.00
Slope (%)	= 0.50	0.00	0.00	n/a
N-Value	= .013	.013	.013	n/a
Orifice Coeff.	= 0.60	0.60	0.60	0.60
Multi-Stage	= n/a	No	No	No

Weir Structures

	[A]	[B]	[C]	[D]
Crest Len (ft)	= 1.00	0.00	0.00	0.00
Crest El. (ft)	= 102.25	0.00	0.00	0.00
Weir Coeff.	= 3.33	3.33	3.33	3.33
Weir Type	= Rect	---	---	---
Multi-Stage	= No	No	No	No

Exfil.(in/hr) = 0.000 (by Contour)

TW Elev. (ft) = 0.00

Note: Culvert/Orifice outflows are analyzed under inlet (ic) and outlet (oc) control. Weir risers checked for orifice conditions (ic) and submergence (s).

Stage / Storage / Discharge Table

Stage ft	Storage cuft	Elevation ft	Clv A cfs	Clv B cfs	Clv C cfs	PrfRsr cfs	Wr A cfs	Wr B cfs	Wr C cfs	Wr D cfs	Exfil cfs	User cfs	Total cfs
0.00	0	100.00	0.00	---	---	---	0.00	---	---	---	---	---	0.000
0.50	506	100.50	0.17 oc	---	---	---	0.00	---	---	---	---	---	0.166
1.00	1,385	101.00	0.82 ic	---	---	---	0.00	---	---	---	---	---	0.819
1.50	2,454	101.50	1.06 ic	---	---	---	0.00	---	---	---	---	---	1.057
2.00	3,631	102.00	1.25 ic	---	---	---	0.00	---	---	---	---	---	1.251
2.50	4,862	102.50	1.42 ic	---	---	---	0.42	---	---	---	---	---	1.834
3.00	6,092	103.00	1.57 ic	---	---	---	2.16	---	---	---	---	---	3.731
3.50	7,269	103.50	1.70 ic	---	---	---	4.65	---	---	---	---	---	6.358
4.00	8,337	104.00	1.83 ic	---	---	---	7.71	---	---	---	---	---	9.540
4.50	9,216	104.50	1.95 ic	---	---	---	11.24	---	---	---	---	---	13.19
5.00	9,721	105.00	2.06 ic	---	---	---	15.19	---	---	---	---	---	17.25

APPENDIX F

National Flood Hazard Layer Map

National Flood Hazard Layer FIRMette

FEMA

117°1'36"W 33°14'4"N

117°0'59"W 33°13'33"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 / 17.5 Cross Sections with 1% Annual Chance / Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

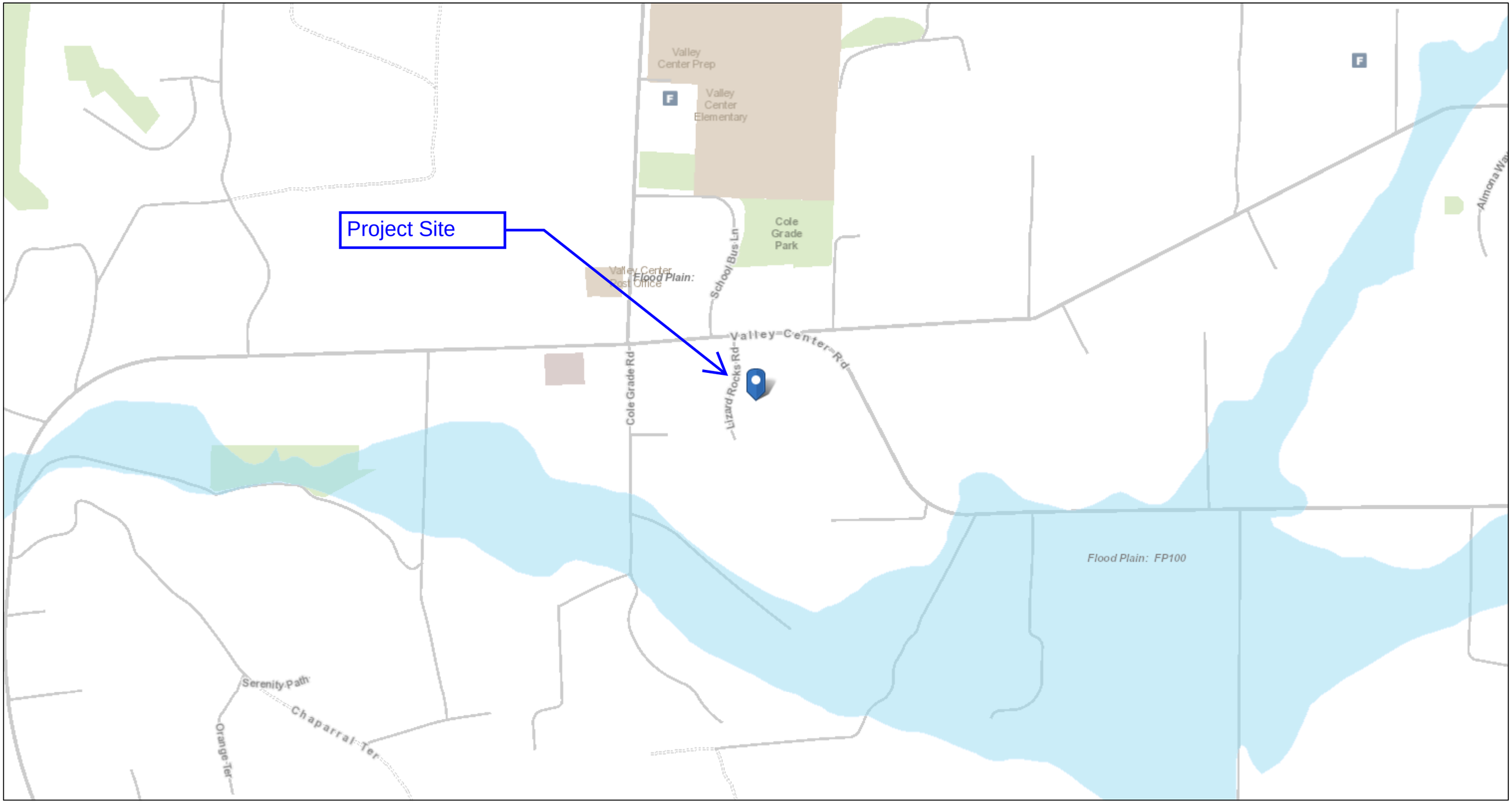
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 11/23/2020 at 11:38 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

(San Diego County) Parcel Lookup Tool Map



November 23, 2020

1:9,028

0 0.1 0.2 0.4 mi

0 0.175 0.35 0.7 km

SanGIS

Flood Plain

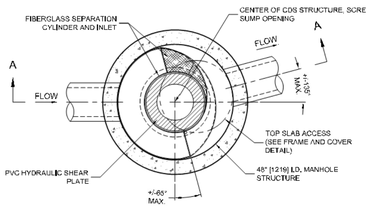
- ZONE X
- FP100
- FP500
- FW100

Data Sources: SANDAG and SanGIS

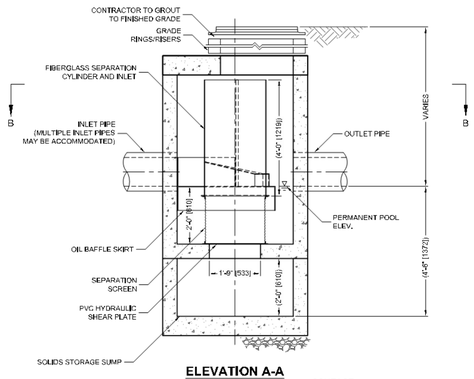
SanGIS Legal Notice: http://www.sangis.org/Legal_Notice.htm

APPENDIX G

Conceptual Utility Plan



PLAN VIEW B-B
N.T.S.



ELEVATION A-A
N.T.S.

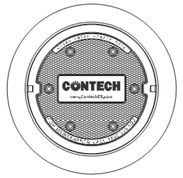
CONTACT:
Contech Engineered Solutions LLC
ALEXANDRA DUBROCK
ADubrock@conteches.com
(657) 235-3932

CDS2015-4-C DESIGN NOTES

CDS2015-4-C RATED TREATMENT CAPACITY IS 6.7 CFS (189 L/s), OR PER LOCAL REGULATIONS. MAXIMUM HYDRAULIC INTERNAL BYPASS CAPACITY IS 10.0 CFS (283 L/s). IF THE SITE CONDITIONS EXCEED 10.0 CFS (283 L/s) CFS, AN UPSTREAM BYPASS STRUCTURE IS REQUIRED.

THE STANDARD CDS2015-4-C CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW. SOME CONFIGURATIONS MAY BE COMBINED TO SUIT SITE REQUIREMENTS.

CONFIGURATION DESCRIPTION
GRATED INLET ONLY (NO INLET PIPE)
GRATED INLET WITH INLET PIPE OR PIPES
CURB INLET ONLY (NO INLET PIPE)
CURB INLET WITH INLET PIPE OR PIPES
SEPARATE OIL BAFFLE (SINGLE INLET PIPE REQUIRED FOR THIS CONFIGURATION)
SEDIMENT WIER FOR HJDEP / NJDAT CONFORMING UNITS



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (CFS OR L/s)			*
PEAK FLOW RATE (CFS OR L/s)			*
RETURN PERIOD OF PEAK FLOW (YRS)			*
SCREEN APERTURE (2400 OR 4700)			*
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
INLET PIPE 2	*	*	*
OUTLET PIPE	*	*	*
RIM ELEVATION			*
ANTI-FLOTATION BALLAST	WIDTH *		HEIGHT *
NOTES/SPECIAL REQUIREMENTS:			

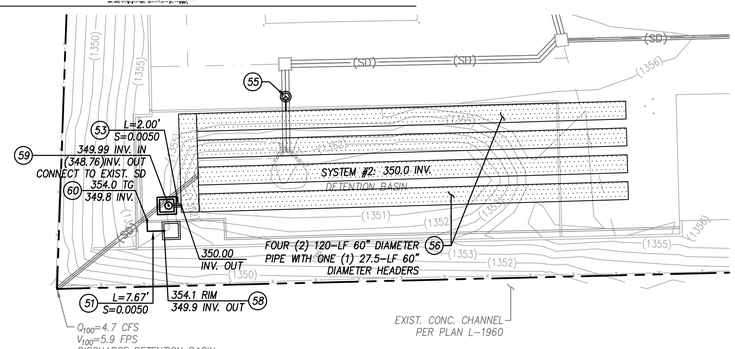
* PER ENGINEER OF RECORD

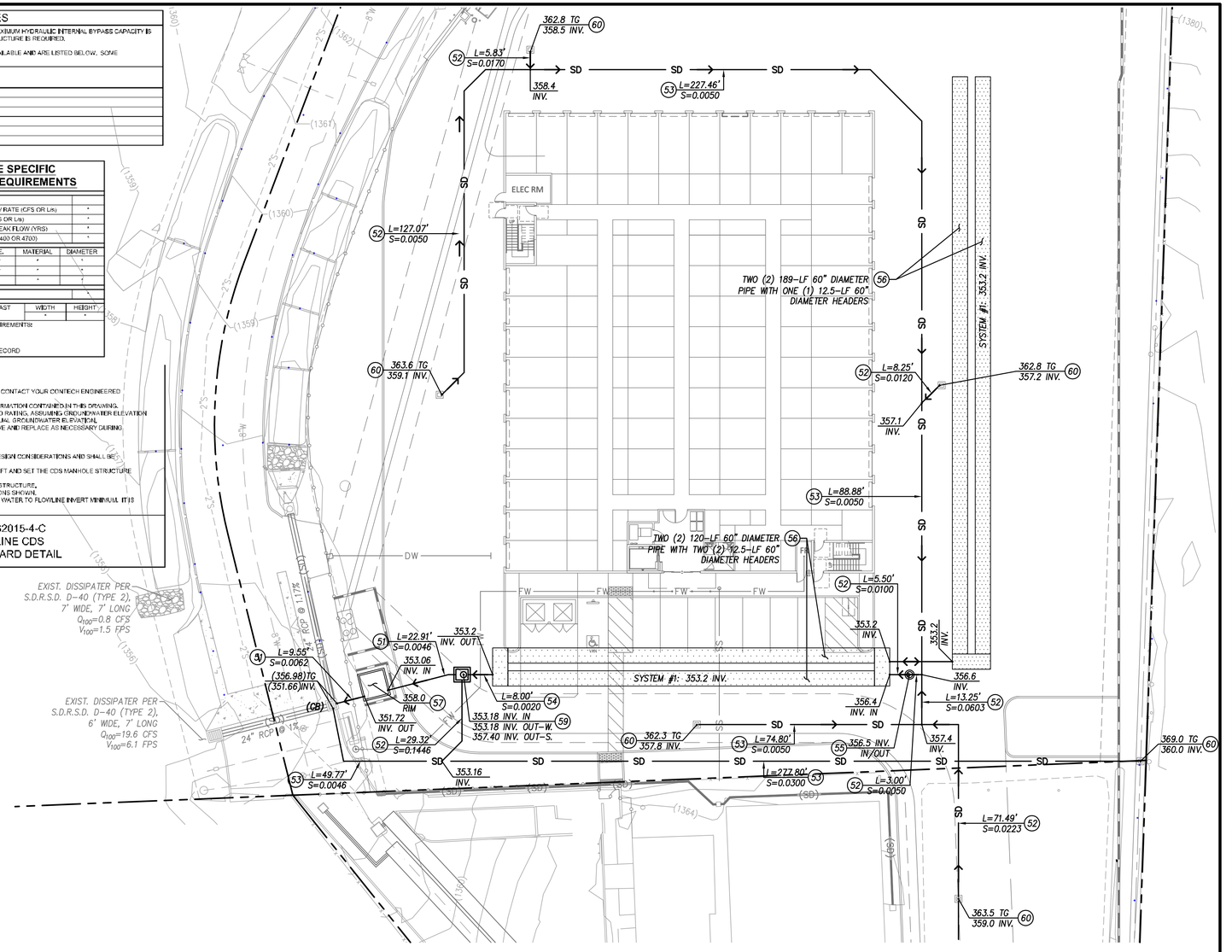
GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE, www.ContechES.com
4. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET HS20 (AASHTO M 306) LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION, ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.
6. PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
C. CONTRACTOR TO ADD JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH ENGINEERED SOLUTIONS LLC
www.ContechES.com
9025 Centre Pointe Dr, Suite 400, West Chester, OH 45069
800-338-1122 513-645-7000 513-645-7993 FAX

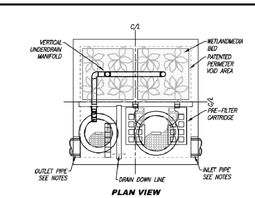
CDS2015-4-C
INLINE CDS
STANDARD DETAIL



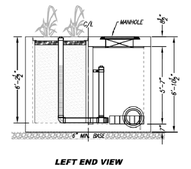


DETAIL FOR STORM DRAIN SYSTEM AT SOUTHWEST CORNER OF THE SITE
SCALE: 1"=20'

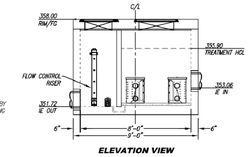
SITE SPECIFIC DATA			
PROJECT NUMBER	12099		
PROJECT NAME	28435 LIZARD ROCKS ROAD		
PROJECT LOCATION	VALLEY CENTER, CA		
STRUCTURE ID	BMP #3		
TREATMENT REQUIRED			
VOLUME BASED (CF)	6,000	FLOW BASED (CFS)	
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE		OFFLINE	
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	353.06	HDPE	12"
INLET PIPE 2	N/A	N/A	N/A
OUTLET PIPE	351.72	HDPE	12"
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION	358.00	358.00	356.00
SURFACE LOAD	PEDESTRIAN	N/A	PEDESTRIAN
FRAME & COVER	Ø30"	OPEN PLANTER	Ø24"
WETLANDMEDIA VOLUME (CF)			6.28
ORIFICE SIZE (DIA. INCHES)			5 EA @1.63"
NOTES: PRELIMINARY NOT FOR CONSTRUCTION. EOR TO SET UPSTREAM BYPASS AT 355.90.			



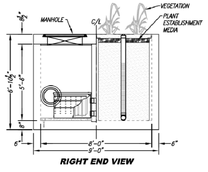
PLAN VIEW



LEFT END VIEW



ELEVATION VIEW



RIGHT END VIEW

CONTACT:
Bio Clean Environmental Services, Inc.
Grant Schipper
Grant.Schipper@forterrabp.com
(612) 382-4284

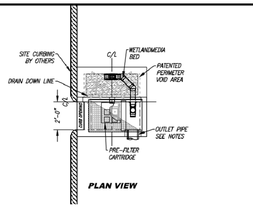
REQUIRED TREATMENT VOLUME (CF)	6,000
DRAWDOWN DURATION (HOURS)	24
AVERAGE DISCHARGE RATE PER MWS UNIT(GPM)	31.55
OPERATING HEAD (FT)	4.1
WETLANDMEDIA INFILTRATION RATE (IN/HR)	26
WETLANDMEDIA LOADING RATE (GPM/SF)	0.26
OR	
WETLANDMEDIA LOADING RATE (GPM/SF)	0.26

GENERAL NOTES
1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT BIO CLEAN.

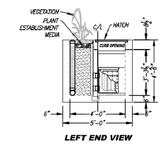
Bio Clean — A Forterra Company

MWS-L-8-8-6'-2.5"-V-HC
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

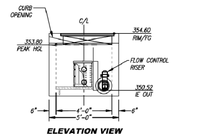
SITE SPECIFIC DATA			
PROJECT NUMBER	12099		
PROJECT NAME	28435 LIZARD ROCKS ROAD		
PROJECT LOCATION	VALLEY CENTER, CA		
STRUCTURE ID	BMP #3		
TREATMENT REQUIRED			
VOLUME BASED (CF)	6,000	FLOW BASED (CFS)	0.045
TREATMENT HGL AVAILABLE (FT)			N/A
PEAK BYPASS REQUIRED (CFS) – IF APPLICABLE			1.08
PIPE DATA	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	N/A	N/A	N/A
INLET PIPE 2	N/A	N/A	N/A
OUTLET PIPE	350.52	PVC	6"
	PRETREATMENT	BIOFILTRATION	DISCHARGE
RIM ELEVATION	354.60	354.60	354.60
SURFACE LOAD	PEDESTRIAN	N/A	PEDESTRIAN
FRAME & COVER	24" X 42"	OPEN PLANTER	N/A
WETLANDMEDIA VOLUME (CY)			0.83
ORIFICE SIZE (DIA. INCHES)			#1.00"
NOTES: PRELIMINARY NOT FOR CONSTRUCTION.			



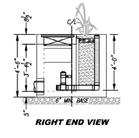
PLAN VIEW



LEFT END VIEW



ELEVATION VIEW



RIGHT END VIEW

INSTALLATION NOTES
1. CONTRACTOR TO PROVIDE ALL LABOR, EQUIPMENT, MATERIALS AND INCIDENTALS REQUIRED TO OFFLOAD AND INSTALL THE SYSTEM AND APPURTENANCES IN ACCORDANCE WITH THIS DRAWING AND THE MANUFACTURERS' SPECIFICATIONS, UNLESS OTHERWISE STATED IN MANUFACTURER'S CONTRACT.
2. UNIT MUST BE INSTALLED ON LEVEL BASE. MANUFACTURER RECOMMENDS A MINIMUM 6" LEVEL ROCK BASE UNLESS SPECIFIED BY THE PROJECT ENGINEER. CONTRACTOR IS RESPONSIBLE FOR VERIFYING PROJECT ENGINEER'S RECOMMENDED BASE SPECIFICATIONS.
4. CONTRACTOR TO SUPPLY AND INSTALL ALL EXTERNAL CONNECTING PIPES. ALL PIPES MUST BE FLUSH WITH INSIDE SURFACE OF CONCRETE (PIPES CANNOT INTRUDE BEYOND FLUSH). INVERT OF OUTFLOW PIPE MUST BE FLUSH WITH DISCHARGE CHAMBER FLOOR. ALL PIPES SHALL BE SEALED WATERTIGHT PER MANUFACTURER'S STANDARD CONNECTION DETAIL.
5. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL PIPES, RISERS, MANHOLES, AND HATCHES. CONTRACTOR TO GROUT ALL MANHOLES AND HATCHES TO MATCH FINISHED SURFACE UNLESS SPECIFIED OTHERWISE.
6. VEGETATION SUPPLIED AND INSTALLED BY OTHERS. ALL UNITS WITH VEGETATION MUST HAVE DRIP OR SPRAY IRRIGATION SUPPLIED AND INSTALLED BY OTHERS.
7. CONTRACTOR RESPONSIBLE FOR CONTACTING BIO CLEAN FOR ACTIVATION OF UNIT. MANUFACTURER'S WARRANTY IS VOID WITHOUT PROPER ACTIVATION BY A BIO CLEAN REPRESENTATIVE.

INTERNAL BYPASS DISCLOSURE:
THE DESIGN AND CAPACITY OF THE PEAK CONVEYANCE METHOD TO BE REVIEWED AND APPROVED BY THE ENGINEER OF RECORD. HGL(S) AT PEAK FLOW SHALL BE ASSESSED TO ENSURE NO UPSTREAM FLOODING. PEAK HGL AND BYPASS CAPACITY SHOWN ON DRAWING ARE USED FOR CLEARANCE ONLY.

GENERAL NOTES
1. MANUFACTURER TO PROVIDE ALL MATERIALS UNLESS OTHERWISE NOTED.
2. ALL DIMENSIONS, ELEVATIONS, SPECIFICATIONS AND CAPACITIES ARE SUBJECT TO CHANGE. FOR PROJECT SPECIFIC DRAWINGS DETAILING EXACT DIMENSIONS, WEIGHTS AND ACCESSORIES PLEASE CONTACT BIO CLEAN.

TREATMENT FLOW (CFS)	0.045
OPERATING HEAD (FT)	3.0
PRETREATMENT LOADING RATE (GPM/SF)	1.6
WETLAND MEDIA LOADING RATE (GPM/SF)	1.0

Bio Clean — A Forterra Company

MWS-L-4-4-4'-0"-C
STORMWATER BIOFILTRATION SYSTEM
STANDARD DETAIL

STORM DRAIN CONSTRUCTION NOTES:

(51) CONSTRUCT 8" PVC STORM DRAIN
(52) CONSTRUCT 12" PVC STORM DRAIN
(53) CONSTRUCT 18" HDPE STORM DRAIN
(54) CONSTRUCT 24" HDPE STORM DRAIN
(55) INSTALL CONTECH CDS UNIT, CDS2015-4-C, FOR TREATMENT WITH OVERFLOW BYPASS
(56) INSTALL CONTECH CMP DETENTION SYSTEM
(57) INSTALL MODULAR WETLAND SYSTEM (MWS), MWS-L-8-8-V, FOR STORMWATER TREATMENT
(58) INSTALL MODULAR WETLAND SYSTEM (MWS), MWS-L-4-4-C, FOR STORMWATER TREATMENT
(59) CONSTRUCT WEIR OUTLET STRUCTURE MANHOLE PER DETAIL ON SHEET 3
(60) CONSTRUCT 18"x18" GRATE INLET
(61) CONSTRUCT CHANNEL DRAIN

LEGEND:

⟵ DIRECTION OF PIPE FLOW
—SD— PROPOSED STORM DRAIN SYSTEM
(CB) EXISTING CATCH BASIN/DRAINAGE LINE

20' 0' 20' 40' 60'
GRAPHIC SCALE: 1"=20'

PREPARED BY:
DRC Engineering, Inc.
160 S. Old Springs Road
Suite 210
Anaheim Hills, CA 92808
714-685-6860
Civil Engineering/Land Surveying/Land Planning
GREGORY R. COOKE R.C.E. 39478 DATE

NOT FOR CONSTRUCTION

PROFESSIONAL ENGINEER * GREGORY R. COOKE * No. 39478 Exp. 12-31-21 * CIVIL * STATE OF CALIFORNIA *

NO.:	REVISION:	DATE:

PROJECT: **GS VALLEY EXPANSION**
24835 LIZARD ROCKS ROAD
VALLEY CENTER, CA 92082
DRAWING NAME: **PRELIMINARY STORM DRAIN PLAN**

ISSUE:	CONCEPTUAL
DATE:	05/25/2021
CHECKED: GRC	DRAWN: MS
DRAWING FILE: 19132CG	
PROJECT NO.: 19-132	
SHEET NUMBER: 4	
OF 6 SHEETS	
SCALE: AS SHOWN	

APPENDIX H

As-Built Reference Plans

GENERAL NOTES

1. A PERMIT SHALL BE OBTAINED FROM THE COUNTY DEPARTMENT OF PUBLIC WORKS FOR ANY WORK WITHIN THE COUNTY RIGHT-OF-WAY.
2. THE STRUCTURAL SECTION SHALL BE IN ACCORDANCE WITH SAN DIEGO COUNTY STANDARDS FOR PRIVATE ROADS AND AS APPROVED BY THE MATERIALS LABORATORY.
3. APPROVAL OF THESE IMPROVEMENT PLANS AS SHOWN DOES NOT CONSTITUTE APPROVAL OF ANY CONSTRUCTION OUTSIDE THE PROJECT BOUNDARY.
4. ALL UNDERGROUND UTILITIES WITHIN THE STREET RIGHT-OF-WAY SHALL BE CONSTRUCTED, CONNECTED AND TESTED PRIOR TO CONSTRUCTION OF DIKE, CURB, CROSS GUTTER AND PAVING.
5. THE EXISTENCE AND LOCATION OF EXISTING UNDERGROUND FACILITIES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS TO THE BEST OF OUR KNOWLEDGE THERE ARE NO OTHER EXISTING FACILITIES EXCEPT AS SHOWN ON THESE PLANS. HOWEVER THE CONTRACTOR IS REQUIRED TO TAKE PRECAUTIONARY MEASURES TO PROTECT ANY EXIST ING FACILITY SHOWN HEREON AND ANY OTHER WHICH IS NOT OF RECORD OR NOT SHOWN ON THESE PLANS.
6. LOCATION AND ELEVATION OF IMPROVEMENTS TO BE MET BY WORK TO BE DONE SHALL BE CONFIRMED BY FIELD MEASUREMENTS PRIOR TO CONSTRUCTION OF NEW WORK. CONTRACTOR WILL MAKE EXPLORATORY EXCAVATIONS AND LOCATE EXISTING UNDERGROUND FACILITIES SUFFICIENTLY AHEAD OF CONSTRUCTION TO PERMIT REVISIONS TO PLANS IF REVISIONS ARE NECESSARY BECAUSE OF ACTUAL LOCATION OF EXISTING FACILITIES.
7. THE CONTRACTOR SHALL NOTIFY THE SAN DIEGO GAS AND ELECTRIC COMPANY PRIOR TO STARTING WORK NEAR COMPANY FACILITIES AND SHALL COORDINATE HIS WORK WITH COMPANY REPRESENTATIVES.
   NOTICE: ALL ELECTRICAL AND GAS SERVICES WITHIN THIS PROJECT ARE "UNDERGROUND INSTALLATIONS." FOR LOCATIONS OF ELECTRICAL CABLES AND GAS PIPING AND APPURTENANCES CONTACT THE SAN DIEGO GAS AND ELECTRIC COMPANY.
   TELEPHONE: 619-232-4252
8. THE CONTRACTOR SHALL NOTIFY PACIFIC BELL TELEPHONE COMPANY PRIOR TO STARTING WORK NEAR COMPANY FACILITIES AND SHALL COORDINATE HIS WORK WITH COMPANY REPRESENTATIVES.
   NOTICE: ALL TELEPHONE SERVICES WITHIN THIS PROJECT BOUNDARY ARE "UNDERGROUND INSTALLATIONS" FOR LOCATION OF CABLES AND APPURTENANCES CONTACT PACIFIC BELL TELEPHONE COMPANY
   TELEPHONE: 619-293-0595
9. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER TO CONTACT THE UTILITY AGENCIES, ADVISE THEM OF THE PROPOSED IMPROVEMENTS AND BEAR THE COST OF RELOCATIONS, IF NEEDED.
10. ALL TELEVISION SERVICES WITHIN THIS PROJECT ARE "UNDERGROUND INSTALL ATIONS." FOR LOCATION OF CABLES AND APPURTENANCES CONTACT ADELPHIA CABLE COMMUNICATIONS, TELEPHONE: 760-728-5002
11. NO PAVING SHALL BE DONE UNTIL EXISTING POWER POLES ARE RELOCATED OUTSIDE THE AREAS TO BE PAVED.
12. PRIVATE ROAD IMPROVEMENTS SHOWN HEREON ARE FOR INFORMATION ONLY. COUNTY OFFICIALS SIGNATURE HEREON DOES NOT CONSTITUTE APPROVAL OR RESPONSIBILITY OF ANY KIND FOR THE DESIGN OR CONSTRUCTION OF THESE PRIVATE IMPROVEMENTS.
13. ALL CUT AND FILL SLOPES OVER THREE (3) FEET CREATED BY GRADING FOR STREETS AND DRIVEWAYS SHALL BE HYDROSEEDED WITH SAN DIEGO COUNTY APPROVED HYDROSEED MIXTURE. HYDROSEEDED SLOPES SHALL BE IRRIGATED BY WATER TRUCK UNTIL THE MIXTURE GERMINATES AND GROWTH IS ESTABLISHED.
14. ALL INTERSECTING ROADS AND DRIVEWAYS SHALL BE GRADED AND/ OR RECONSTRUCTED, AS REQUIRED TO MATCH NEW IMPROVEMENTS AND PROVIDE SMOOTH TRANSITION
15. ALL TREES WITHIN THE RIGHT-OF-WAY SHALL BE REMOVED.

SOILS ENGINEER CERTIFICATION

THIS GRADING PLAN HAS BEEN REVIEWED BY THE UNDERSIGNED AND FOUND TO BE CONFORMANCE WITH THE RECOMMENDATIONS AS OUTLINED IN OUR SOILS REPORT FOR THIS PROJECT. THE SOILS REPORT SHALL BE CONSIDERED AS A PART OF THIS PLAN, AND ALL GRADING WORK SHALL BE DONE IN ACCORDANCE WITH THE SPECIFICATIONS AND RECOMMENDATIONS OF SAID REPORT DATED JANUARY 27, 2004
PREPARED BY: NORTH COUNTY COMPACTION ENGINEERING INC., PROJECT NO. CE-7090
TITLED: "PRELIMINARY SOILS INVESTIGATION, LIZARD STORAGE FACILITY, LIZARD ROCKS ROAD, VALLEY CENTER, CALIFORNIA, APN 188-250-41"

REGISTERED PROFESSIONAL ENGINEER DALE R. REGLI GE 713 Exp. 9/30/07 CIVIL STATE OF CALIFORNIA

BY: _____ July 19, 2006
DALE R. REGLI GE 713
P.O.BOX 302002
ESCONDIDO, CA 92030
TELE: 760-480-1116

WORK TO BE DONE

IMPROVEMENTS CONSIST OF THE FOLLOWING WORK TO BE DONE ACCORDING TO THESE PLANS, THE CURRENT SAN DIEGO COUNTY DEPARTMENT OF PUBLIC WORKS STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS FOR IMPROVEMENT OF SUBDIVISION STREETS AND STANDARD REFERENCE DRAWINGS.

ITEM	REGIONAL STANDARD DRAWING NO.	SYMBOL
CONCRETE PAVEMENT (5.5" CONC. / 4" CLASS II)		
ASPHALT CONCRETE DIKE	S.D.R.S.D. C-5 (TYPE A)	
RIP RAP ENERGY DISSIPATER	S.D.R.S.D. D-40 (TYPE 2)	
BROW DITCH	S.D.R.S.D. D-75 (TYPE D)	
MASONRY RETAINING WALL PER S.D.R.S.D. C-3		
6" CONCRETE CURB PER S.D.R.S.D. G- (6")		
TYPE "A" CURB INLET PER S.D.R.S.D. D-1		
STORM DRAIN PIPE		
CUT SLOPE (2:1 MAX)		
FILL SLOPE (2:1 MAX)		
CUT/FILL DAYLIGHT LINE		
WING TYPE HEADWALL PER S.D.R.S.D. D-34		
U TYPE HEADWALL PER S.D.R.S.D. D-34		

EARTHWORK QUANTITIES

	CUT	FILL
EXCAVATION (RAW):	7959 C.Y.	
COMPACTION (RAW):		8644 C.Y.
CLEAR & GRUB:	<0 C.Y.>	
PAVEMENT SECTION:	-0- C.Y.	
TOTALS:	7959 C.Y.	8664 C.Y.
IMPORT:		685 C.Y.

THE EARTHWORK QUANTITIES SHOWN WERE CALCULATED BASED ON THE PRISMOIDAL (CONTOUR SLICE) METHOD. THE QUANTITIES INCLUDE STREET PAVEMENT AND BASE (RAW) VOLUMES.
THE EARTHWORK QUANTITIES SHOWN DO NOT ACCOUNT FOR THE IMPACTS OF THE FINAL EARTH MOVING QUANTITIES OF THE FOLLOWING ITEMS.

1) SHRINK OR SWELL OF THE NATIVE OR IMPORTED MATERIAL
2) EXCAVATION OF BUILDING AND COLUMN FOOTINGS
3) SPOIL MATERIAL CREATED FROM PIPE TRENCHING AND BACKFILL
4) PLACEMENT OF LANDSCAPING TOP SOILS
5) RETAINING WALL EXCAVATION AND BACKFILL

THE CONTRACTOR SHALL PREPARE SEPARATE EARTHWORK QUANTITY CALCULATIONS PRIOR TO BIDDING AND SHALL BASE HIS/HER BASE BID EXCLUSIVELY ON HIS/HER OWN COMPUTATION.

OWNER'S CERTIFICATE

IT IS AGREED THAT FIELD CONDITIONS MAY REQUIRE CHANGES TO THESE PLANS.

IT IS FURTHER AGREED THAT THE OWNER (DEVELOPER) SHALL HAVE A REGISTERED CIVIL ENGINEER MAKE SUCH CHANGES, ALTERATIONS OR ADDITIONS TO THESE PLANS WHICH THE DIRECTOR OF PUBLIC WORKS DETERMINES ARE NECESSARY AND DESIRABLE FOR THE PROPER COMPLETION OF THE IMPROVEMENTS.

I FURTHER AGREE TO COMMENCE WORK ON ANY IMPROVEMENTS SHOWN ON THESE PLANS WITHIN EXISTING COUNTY RIGHT-OF-WAY WITHIN 60 DAYS AFTER ISSUANCE OF THE CONSTRUCTION PERMIT AND TO PURSUE SUCH WORK ACTIVELY IN EVERY NORMAL WORKING DAY UNTIL COMPLETED, IRRESPECTIVE AND INDEPENDENT OF OTHER WORK ASSOCIATED WITH THIS PROJECT UNDER MY CONTROL.

OWNER/PERMITTEE:

BY: ~~JOSEPH GALLAGHER~~ ~~LIZARD ROCK LLC~~ DATE ~~7-18-06~~

2 M Farley 2/20/12
MIKE FARLEY DATE
CML-CA LIZARD ROCK, LLC

SPECIAL GRADING NOTE

RESTRICT ALL BRUSHING, CLEARING AND/ OR GRADING SUCH THAT NONE WILL BE ALLOWED DURING THE AVIAN BREEDING SEASON. THIS IS DEFINED AS OCCURRING BETWEEN FEBRUARY 1 AND AUGUST 1. THE DIRECTOR OF PLANNING AND LAND USE, MAY WAIVE THIS CONDITION, THROUGH WRITTEN CONCURRENCE FROM THE UNITED STATES FISH AND WILDLIFE SERVICE AND THE CALIFORNIA DEPARTMENT OF FISH AND GAME, THAT NO NESTING BIRDS ARE PRESENT IN THE VICINITY OF THE BRUSHING, CLEARING OR GRADING.

FIRE DEPARTMENT NOTE

ALL ONSITE FIRE HYDRANTS MUST BE COMMERCIAL HYDRANTS AND HAVE A MINIMUM FIRE FLOW OF 2000 G.P.M. AT 25 P.S.I. ALL COMPONENTS MUST MEET THE APPROVAL OF THE VALLEY CENTER FIRE PROTECTION DISTRICT AND THE VALLEY CENTER MUNICIPAL WATER DISTRICT. DESIGN OF THE WATER SUPPLY, TYPE AND LOCATION OF THE FIRE HYDRANTS MUST BE SUBMITTED TO THE FIRE MARSHALL FOR APPROVAL PRIOR TO ANY BUILDING MATERIALS BEING PLACED ON SITE.

GENERAL NOTES

1. APPROVAL OF THIS GRADING PLAN DOES NOT CONSTITUTE APPROVAL OF VERTICAL OR HORIZONTAL ALIGNMENT OF ANY PRIVATE ROAD SHOWN HEREON FOR COUNTY ROAD PURPOSES.
2. FINAL APPROVAL OF THESE GRADING PLANS SUBJECT TO FINAL APPROVAL OF THE ASSOCIATED IMPROVEMENT PLANS WHERE APPLICABLE. FINAL CURB ELEVATIONS MAY REQUIRE CHANGES IN THESE PLANS.
3. IMPORT MATERIAL SHALL BE OBTAINED FROM A LEGAL SITE.
4. A CONSTRUCTION, EXCAVATION OR ENCROACHMENT PERMIT FROM THE DEPARTMENT OF PUBLIC WORKS WILL BE REQUIRED FOR ANY WORK IN THE COUNTY RIGHT-OF-WAY.
5. ALL SLOPES OVER THREE FEET IN HEIGHT WILL BE PLANTED IN ACCORDANCE WITH SAN DIEGO COUNTY SPECIFICATIONS.
6. THE CONTRACTOR SHALL VERIFY THE EXISTENCE AND LOCATION OF ALL UTILITIES BEFORE COMMENCING WORK. NOTICE OF PROPOSED WORK SHALL BE GIVEN TO THE FOLLCWING AGENCIES:

SAN DIEGO GAS & ELECTRIC:	TELEPHONE NO. 619-232-4252, EXT. 1658
S.B.C.	TELEPHONE NO: 619-296-0595
CATV: ADELPHIA CABLE COMMUNICATIONS,	TELEPHONE: 760-728-5002
WATER: FALLBROOK PUBLIC UTILITY DIST.	TELEPHONE NO: 760-749-1600
DIGALERT:	TELEPHONE NO: 1-800-422-4133

7. A SOILS REPORT MAY BE REQUIRED PRIOR TO THE ISSUANCE OF A BUILDING PERMIT.
8. APPROVAL OF THESE PLANS BY THE DIRECTOR OF PUBLIC WORKS DOES NOT AUTHORIZE ANY WORK OR GRADING TO BE PERFORMED UNTIL THE PROPERTY OWNER'S PERMISSION HAS BEEN OBTAINED AND VALID GRADING PERMIT HAS BEEN ISSUED.
9. THE DIRECTOR OF PUBLIC WORKS' APPROVAL OF THESE PLANS DOES NOT CONSTITUTE COUNTY BUILDING OFFICIAL APPROVAL OF ANY FOUNDATION FOR STRUC-TURES TO BE PLACED ON THE AREA COVERED BY THESE PLANS. NO WAIVER OF THE GRADING ORDINANCE REQUIREMENTS CONCERNING MINIMUM COVER OVER EXPANSIVE SOIL IS MADE OR IMPLIED (SECTIONS 87.403 & 87.410). ANY SUCH WAIVER MUST BE OBTAINED FROM THE DIRECTOR OF PLANNING AND LAND USE.
10. ALL OPERATIONS CONDUCTED ON THE PREMISES, INCLUDING THE WARMING UP, REPAIR, ARRIVAL, DEPARTURE OR RUNNING OF TRUCKS, EARTH MOVING EQUIPMENT, CONSTRUCTION EQUIPMENT AND ANY OTHER ASSOCIATED GRADING EQUIPMENT SHALL BE LIMITED TO THE PERIOD BETWEEN 7:00 AM AND 6:00 PM EACH DAY. MONDAY THRU SATURDAY, AND NO EARTH MOVING OR GRADING OPERATIONS SHALL BE CONDUCTED ON THE PREMISES ON SUNDAYS OR HOLIDAYS.
11. ALL MAJOR SLOPES SHALL BE ROUNDED INTO EXISTING TERRAIN TO PRODUCE A CON-TOURED TRANSITION FROM CUT OR FILL FACES TO NATURAL GROUND AND ABUTTING CUT OR FILL SURFACES.
12. NOTWITHSTANDING THE MINIMUM STANDARDS SET FORTH IN THE GRADING ORDINANCE AND NOTWITHSTANDING THE APPROVAL OF THESE GRADING PLANS, THE PERMITTEE IS RESPON-IBLE FOR THE PREVENTION OF DAMAGE TO ADJACENT PROPERTY. NO PERSON SHALL EXCAVATE ON LAND SO CLOSE TO THE PROPERTY LINE AS TO ENDANGER ANY ADJOINING PUBLIC STREET, SIDEWALK, ALLEY, FUNCTION O ANY SEWAGE DISPOSAL SYSTEM, OR ANY OTHER PUBLIC OR PRIVATE PROPERTY WITHOUT SUPPORTING AND PROTECTING SUCH PROPERTY FROM SETTLING, CRACKING, EROSION, SILTING, SCOUR OR OTHER DAMAGE WHICH MIGHT RESULT FROM THE GRADING DESCRIBED ON THIS PLAN. THE COUNTY WILL HOLD THE PERMITTEE RESPONSIBLE FOS CORRECTION OF NON-DEDICATED IMPROVEMENTS WHICH DAMAGE ADJACENT PROPERTY.
13. SLOPE RATIOS:

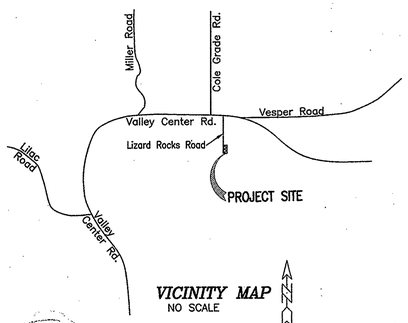
    CUT-2:1

    FILL-2:1

    EXCAVATION: 7959 C.Y.
    FILL: 8644 C.Y.
    IMPORT: 685 C.Y.

    (NOTE: A SEPARATE VALID PERMIT MUST EXIST FOR EITHER WASTE OR IMPORT AREAS)
14. SPECIAL CONDITION: IF ANY ARCHEOLOGICAL RESOURCES ARE DISCOVERED ON THE SITE OF THIS GRADING DURING GRADING OPERATIONS, SUCH OPERATIONS WILL CEASE IMMEDIATELY, AND THE PERMITTEE WILL NOTIFY THE DIRECTOR OF PUBLIC WORKS OF THE DISCOVERY. GRADING OPERATIONS WILL NOT RECOMMENCE UNTIL THE PERMITTEE HAS RECEIVED WRITTEN AUTHORITY FROM THE DIRECTOR OF PUBLIC WORKS TO DO SO.
15. FINISHED GRADING SHALL BE CERTIFIED BY A REGISTERED CIVIL ENGINEER AND INSPECTED BY THE COUNTY ENGINEER FOR DRAINAGE CLEARANCE. (APPROVAL OF ROUGH GRADING DOES NOT CERTIFY FINISH BECAUSE OF POTENTIAL SURFACE DRAIN-AGE PROBLEMS THAT MAY BE CREATED BY LANDSCAPING ACCOMPLISHED AFTER ROUGH GRADING CERTIFICATION.

SHEET LEGEND



VICINITY MAP
NO SCALE

THOMAS BROS. PAGE 1090, F2

AQUAterra Engineering Inc.
CIVIL ENGINEERING * LAND PLANNING
1843 Campesino Place
Oceanside, CA 92054
Tele: (760) 439-2802
Fax: (760) 439-2866

OWNER'S / PERMITTEE'S 2

NAME: ~~LIZARD ROCK LLC~~ CML-CA LIZARD ROCK LLC
ADDRESS: ~~1728 YUCCA ROAD~~ ~~OCEANSIDE, CA 92054~~ 700 NORTHWEST 107TH AVENUE MIAMI, FL 33172
TELEPHONE NO: ~~760-754-3130~~
SHORT LEGAL DESCRIPTION: ~~PARCEL 3, PARCEL MAP NO. 7078~~
A.P.N. NO: 188-250-41
SITE ADDRESS: 28407 LIZARD ROCKS ROAD, VALLEY CENTER

STORMWATER TREATMENT BMP TABLE

DESCRIPTION / TYPE	SHEET NO.	MAINTENANCE CATEGORY	REVISIONS
CATCH BASIN INSERTS	3 & 4	4/16 ONE	

BMPS APPROVED AS PART OF THE STORMWATER MANAGEMENT PLAN DATED 1/31/12 ON FILE WITH DPW. ANY CHANGES TO THE ABOVE BMPS WILL REQUIRE SWMP REVISION AND PLAN CHANGE APPROVALS. 2

REGISTERED PROFESSIONAL ENGINEER GARY LIPSKA No. 23080 EXP 12/31/09 CIVIL STATE OF CALIFORNIA — EXPIRE 12/31/13 2

ENVIRONMENTAL SERVICES UNIT 2
Approved for Compliance With Environmental Review
Approved By SUS WATERS
Date JANUARY 25, 2012

FIRE AGENCY
VALLEY CENTER FIRE PROTECTION DISTRICT
APPROVAL: [signature]
DATE: 7/19/06

RECORD PLAN
NAME
BY: _____ DATE: 10/9/12
R.C.E. 23080
EXPIRES: 12/31/13

DECLARATION OF RESPONSIBLE CHARGE

I HEREBY DECLARE THAT I AM THE ENGINEER OF WORK FOR THIS PROJECT, THAT I HAVE EXERCISED RESPONSIBLE CHARGE OVER THE DESIGN OF THE PROJECT AS DEFINED IN SECTION 6703 OF THE BUSINESS AND PROFESSIONS CODE, AND THAT THE DESIGN IS CONSISTENT WITH CURRENT STANDARDS.

I UNDERSTAND THAT THE CHECK OF PROJECT DRAWINGS AND SPEC-IFICATIONS BY THE COUNTY OF SAN DIEGO IS CONFINED TO REVIEW ONLY AND DOES NOT RELIEVE ME, AS ENGINEER OF WORK, OF MY RESPONSIBILITIES FOR PROJECT DESIGN

BY: [signature] DATE: 7/17/06
GARY LIPSKA
RCE NO: 23080 EXPIRES: 12/31/09

COUNTY APPROVED CHANGES

NO.	DESCRIPTION:	APPROVED BY:	DATE:
1	PERMIT EXTENSION	GM	11/2/08
2	ADD: GRADING, BMP TABLE, NEW OWNER; FILTER INSERTS, SHTS 8&9; NEW SHT 11; NEW PERMIT	nka	3/12/2012
3	VOID SHT 13, ADD SHT 8A; VOID SHT 7, ADD SHT 12A; RECORD PLAN	KAB	10/30/13

PERMITS

REZONE PERMIT NO. N/A
SITE PLAN REVIEW NO. S-03-026
STREET IMPROVEMENT PLANS CG 4646
NOTICE OF INTENT(WDID): 9 37C339975

BENCH MARK

DESCRIPTION: MONUMENT NO. 1031 PER R.O.S 14689
2" IRON PIPE W/BRASS DISC MARKED "GPS KE31"
LOCATION: COLE GRADE ROAD, 68' W'LY OF VALLEY CENTER ROAD INTERSECTION
RECORD FROM: NGVD 29
ELEVATION: 1349.30 DATUM: M.S.L.

PRIVATE CONTRACT

SHEET 1 | COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS | 16 SHEETS

GRADING PLAN FOR:
LIZARD ROCKS STORAGE
PARCEL 3, PARCEL MAP NO. 7078
CALIFORNIA COORDINATE INDEX 386-1761

APPROVED FOR: MOHAMAD FAKHRIDDINE COUNTY ENGINEER
BY: ~~Noel Areiza~~ DATE 11.9.06

ENGINEER OF WORK: GARY LIPSKA R.C.E. 23080 EXPIRES 12/31/09 DATE 7/17/06

CHECKED BY: APPROVAL DATE:
GRADING PERMIT NO. L-14940

PLOT DATE: 7/17/06

PDS2012-4701-14940

ENGINEER: AQUATERRA ENGINEERING INC.
TELEPHONE: 760-439-2802

SPECIAL NOTES

THE FOLLOWING NOTES ARE PROVIDED TO GIVE DIRECTIONS TO THE CONTRACTOR BY THE ENGINEER OF WORK. THE COUNTY ENGINEER'S SIGNATURE ON THESE PLANS DOES NOT CONSTITUTE APPROVAL OF THESE PLANS DOES NOT CONSTITUTE APPROVAL OF THESE NOTES AND THE COUNTY WILL NOT BE RESPONSIBLE FOR THEIR ENFORCEMENT.

1) NEITHER THE OWNER NOR THE ENGINEER OF WORK WILL ENFORCE SAFETY MEASURES OR REGULATIONS. THE CONTRACTOR SHALL DESIGN, CONSTRUCT, AND MAINTAIN ALL SAFETY DEVICES, INCLUDING SHORING AND SHALL BE SOLELY RESPONSIBLE FOR CONFORMING TO ALL LOCAL, STATE AND FEDERAL SAFETY HEALTH STANDARDS, LAWS AND REGULATIONS.

2) CONTRACTOR WILL MAKE EXPLORATION EXCAVATIONS AND LOCATE EXISTING UNDERGROUND FACILITIES SUFFICIENTLY AHEAD OF CONSTRUCTION TO PERMIT REVISIONS TO PLANS IF REVISION IS NECESSARY BECAUSE OF NEW WORK.

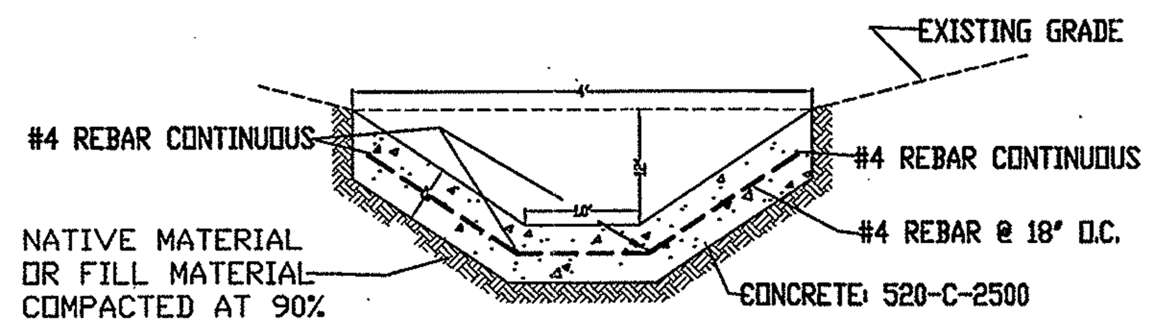
3) CONTRACTOR IS REQUIRED TO TAKE PRECAUTIONARY MEASURES TO PROTECT THE UTILITY LINES SHOWN HEREON AND ANY OTHER EXISTING LINES NOT OF RECORD OR NOT SHOWN ON THESE PLANS.

4) CONTRACTOR SHALL NOTIFY SAN DIEGO GAS & ELECTRIC CO. PRIOR TO STARTING WORK NEAR COMPANY FACILITIES AND SHALL COORDINATE HIS WORK WITH COMPANY REPRESENTATIVES. FOR LOCATION OF ELECTRICAL CABLES, GAS PIPING AND APPURTENANCES, CONTACT THE SAN DIEGO GAS & ELECTRIC COMPANY, TELEPHONE 232–4252, EXT. 1658.

5) CONTRACTOR SHALL NOTIFY THE PACIFIC TELEPHONE CO. PRIOR TO STARTING WORK NEAR COMPANY FACILITIES AND SHALL COORDINATE HIS WORK NEAR COMPANY FACILITIES AND SHALL COORDINATE HIS WORK WITH COMPANY REPRESENTATIVES. FOR LOCATION OF CABLES AND APPURTENANCES, CONTACT THE PACIFIC TELEPHONE COMPANY, TELEPHONE 298–0595.

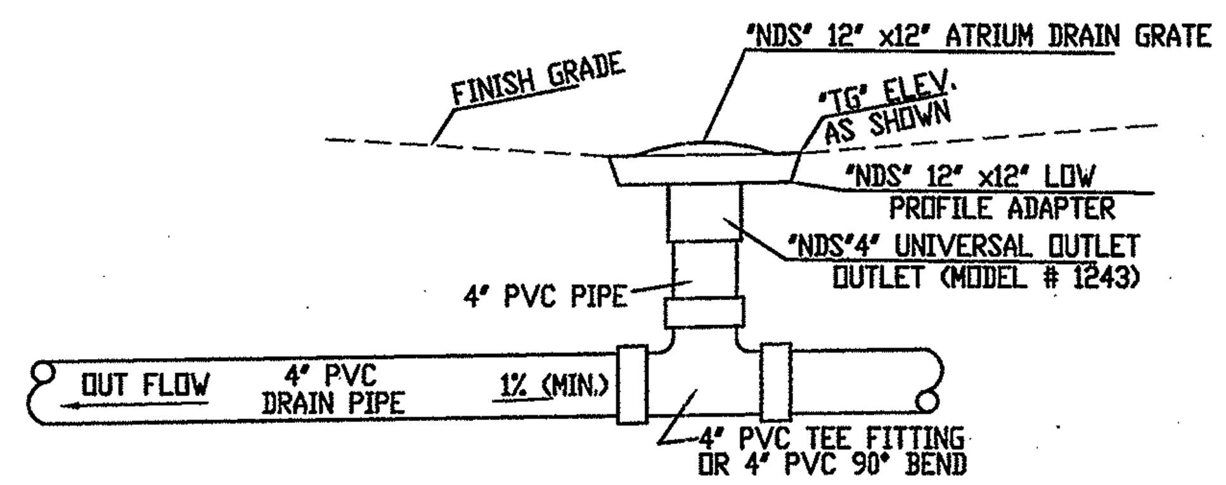
6) CONTRACTOR AGREES THAT HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY, AND THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD 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 THE OWNER OR ENGINEER.

7) THE CONTRACTOR SHALL BE RESPONSIBLE TO INSURE THAT ALL WATER UTILITIES AND STORM DRAINS ARE BUILT IN ACCORDANCE WITH THESE PLANS. IF THERE IS ANY QUESTION REGARDING THESE PLANS OR FIELD STAKES, THE CONTRACTOR SHALL REQUEST AN INTERPRETATION BEFORE DOING ANY WORK BY CALLING THE ENGINEER OF WORK AT 760–439–2802 THE CONTRACTOR SHALL ALSO TAKE THE NECESSARY STEPS TO PROTECT ANY ADJACENT PROPERTY FROM HIS OPERATIONS BY APPROPRIATE MEANS (SAND BAGS, HAY BALES, TEMPORARY DESILTING BASIN, DIKES, SHORING, ETC.) UNTIL SUCH TIME THAT THE PROJECT IS COMPLETED AND ACCEPTED FOR MAINTENANCE BY WHATEVER OWNER, AGENCY OR ASSOCIATION IS TO BE ULTIMATELY RESPONSIBLE FOR MAINTENANCE.



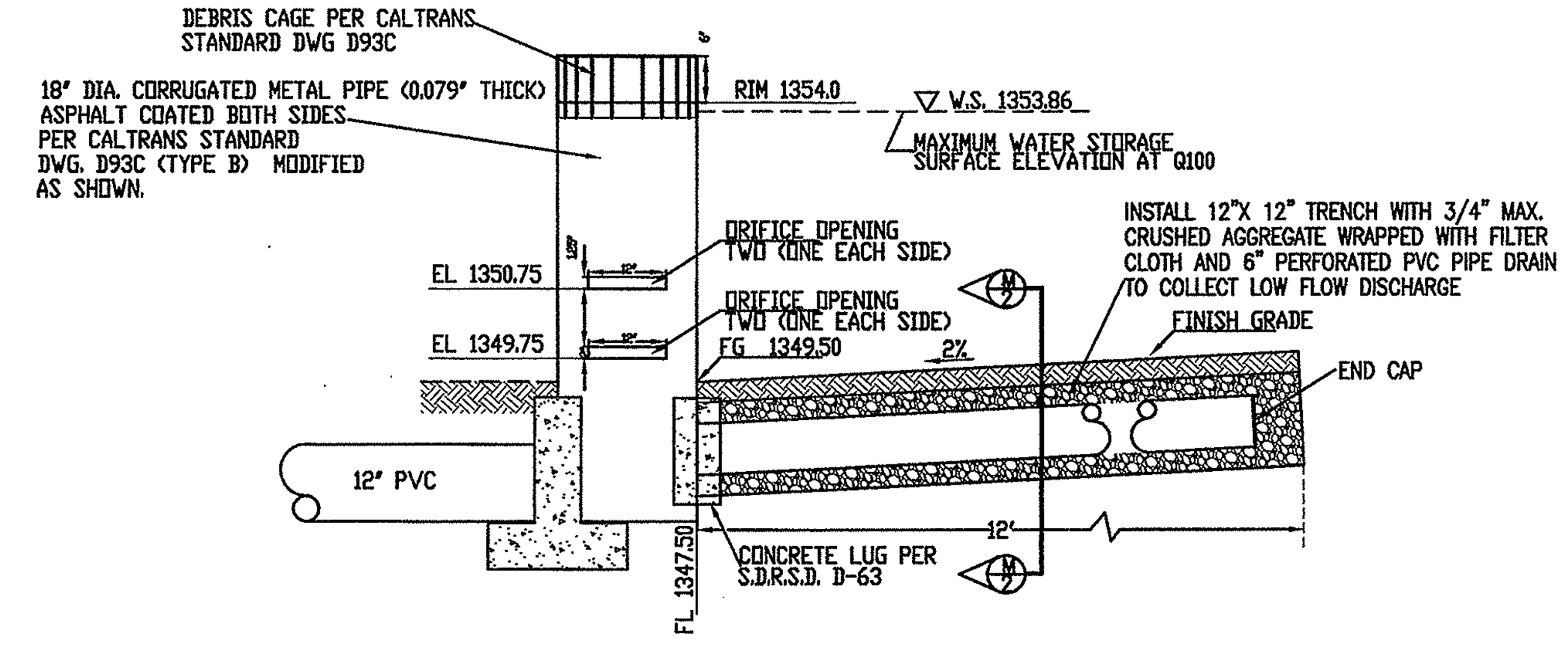
D/2A CONCRETE DRAINAGE CHANNEL DETAIL

NO SCALE



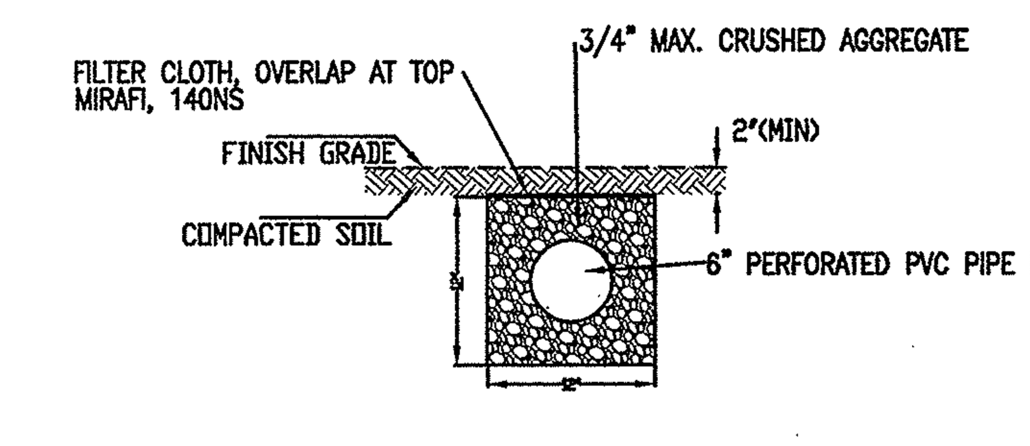
A/2A DETAIL: 12" X 12" DRAIN INLET

NO SCALE



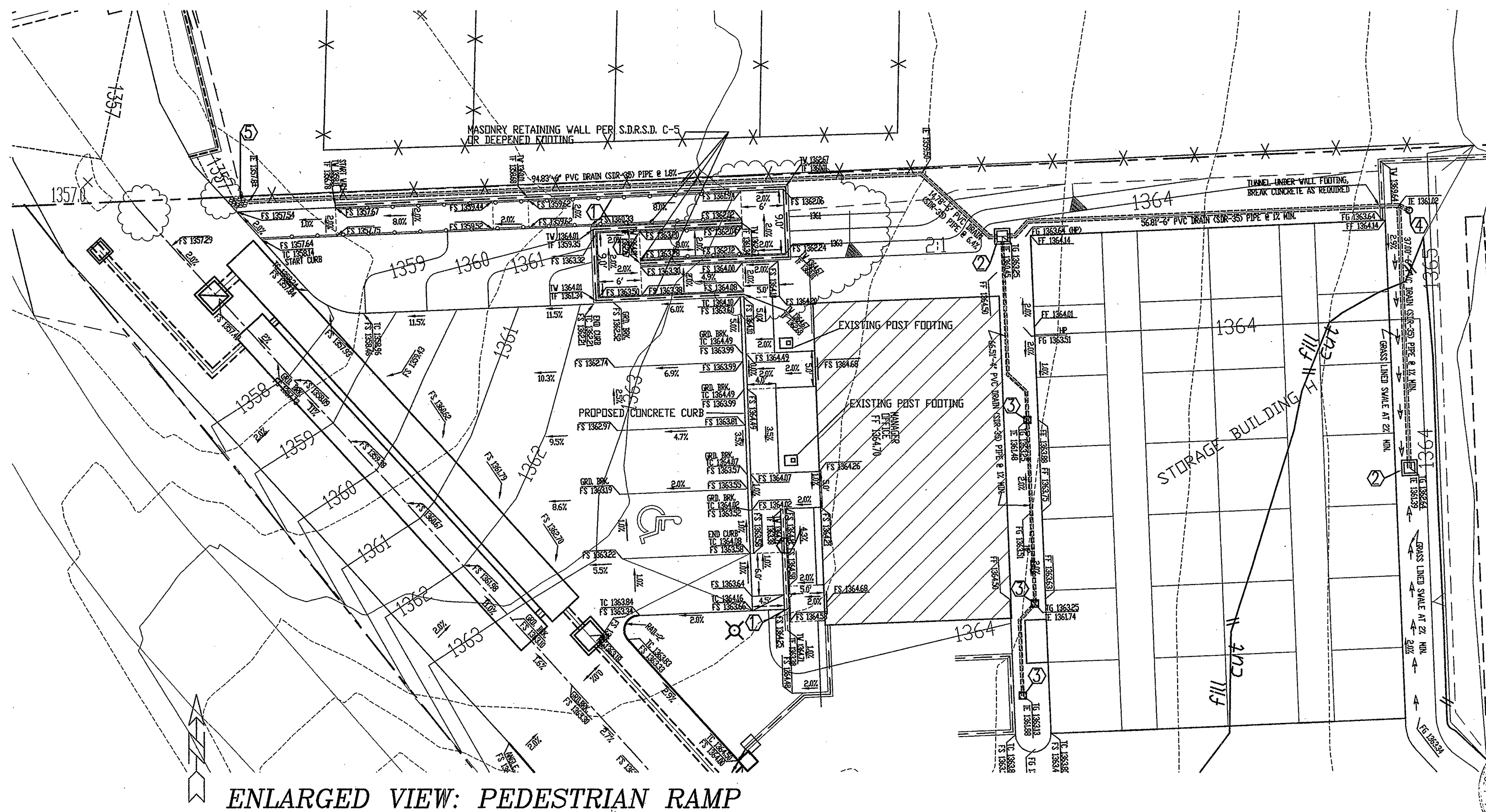
C/2A BASIN DISCHARGE STANDPIPE DETAIL

NO SCALE



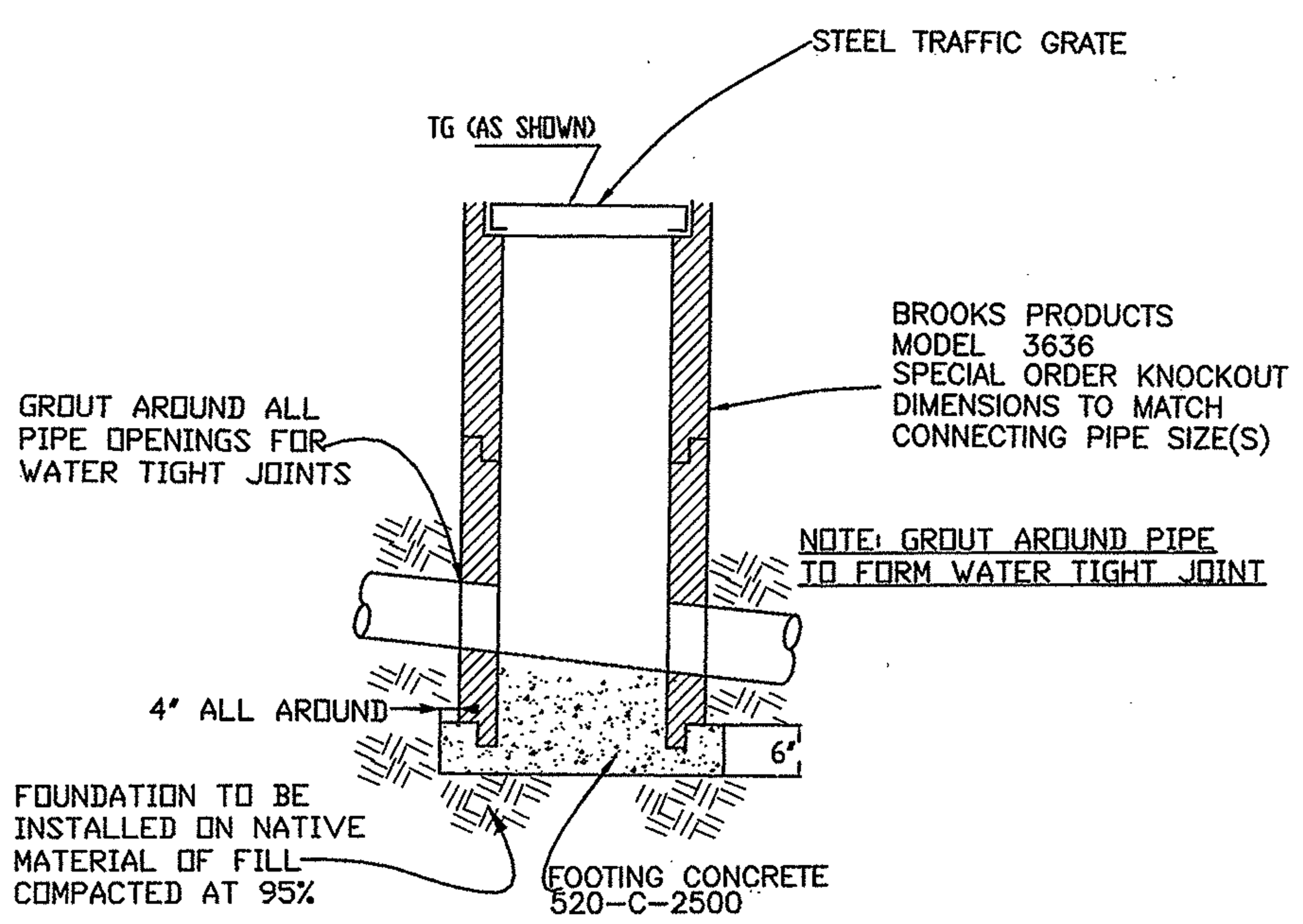
SECTION "M"–"M" SUBDRAIN TRENCH

NO SCALE



ENLARGED VIEW: PEDESTRIAN RAMP

SCALE: 1"= 8'



PAINT NOTE: ALL STEEL COVERS SHALL BE CLEANED, PRIMED AND PAINTED BLACK WITH URETHANE PAINT PER SECTION 310–2 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.

B/2A CATCH BASIN

NO SCALE

ENGINEER'S NOTES

1) ALL PVC DRAINAGE PIPES SHALL CONFORM TO SDR–35 PER ASTM D3034. OR "SURE–LOK F477" AS MANUFACTURED BY HANCOR INC (AASHTO M252, TYPE S)
2) LENGTHS ON DRAINAGE PIPE ARE FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE.
3) CONTRACTOR TO VERIFY HORIZONTAL AND VERTICAL LOCATION OF EXISTING STORM DRAINAGE SYSTEMS PRIOR TO TRENCHING FOR ADJACENT OR CONNECTING FACILITIES. IN THE EVENT ACTUAL LOCATION VARIES SIGNIFICANTLY FROM THAT SHOWN ON PLAN, THE ENGINEER OF WORK SHALL BE NOTIFIED PRIOR TO PROCEEDING.

SYMBOL LEGEND

DESCRIPTION	SYMBOL
ELEVATION, TOP OF FOOTING	TF
ELEVATION, TOP OF WALL	TW
ELEVATION, TOP OF CURB	TC
ELEVATION, FINISH SURFACE	FS
ELEVATION, FINISH GRADE	FG
ELEVATION, TOP OF GRATE	TG
ELEVATION, BOTTOM OF FOOTING	BF
ELEVATION, FLOW LINE	FL
ELEVATION, INVERT ELEVATION	IE
ELEVATION LABEL, EXISTING	(596.00)
ELEVATION LABEL, PROPOSED	596.00
ELEVATION FINISH FLOOR	FF
DETAIL REFERENCE	C/2 DETAIL LABEL / SHEET NO.

REGISTERED PROFESSIONAL ENGINEER GARY LIPSKA No. 23080 CIVIL STATE OF CALIFORNIA

CONSTRUCTION LEGEND

1. HANDRAIL OR GUARDRAIL
2. "NDS" 18" X 18" CATCH BASIN WITH PLASTIC GRATE. (MODEL # 1800)
3. DRAIN INLET PER DETAIL A ON THIS SHEET
4. MODIFIED 6" CLEANOUT PER SDRSD SC-1, TYPE A (MODIFIED TO HAVE CAP AT FINISH GRADE, NO AC PAVEMENT)
5. RIPRAP BLANKET

20 0 20 40
Scale: 1" = 20'

CIVIL ENGINEERING * LAND PLANNING
Aquaterra Engineering Inc.
1843 Campesino Place
Oceanside, CA 92054
Tele: (760) 439–2802
Fax: (760) 439–2866

RECORD PLAN
BY: [signature] NAME DATE: 1/07/13
R.C.E. 23080
EXPIRES: 12/31/13

COUNTY APPROVED CHANGES			
NO.	DESCRIPTION:	APPROVED BY:	DATE:
1	NEW SHEET, RECORD PLAN	KJB	10/30/13

PERMITS

REZONE PERMIT NO. N/A
SITE PLAN REVIEW NO. S–03–026
STREET IMPROVEMENT PLANS CG 4646
NOTICE OF INTENT(WDID): 9 37C339975

BENCH MARK

DESCRIPTION: MONUMENT NO. 1031 PER R.O.S 14689 2" IRON PIPE W/BRASS DISC MARKED "GPS KE31"
LOCATION: COLE GRADE ROAD, 68' W'LY OF VALLEY CENTER ROAD INTERSECTION
RECORD FROM: NGVD 29
ELEVATION: 1349.30 DATUM: M.S.L.

PRIVATE CONTRACT

SHEET 2A | COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS | 16 SHEETS

GRADING PLAN FOR:
LIZARD ROCKS STORAGE
PARCEL 3, PARCEL MAP NO. 7078
CALIFORNIA COORDINATE INDEX 386–1761

APPROVED FOR: MOHAMAD FAKHRRIDDINE COUNTY ENGINEER
Kenneth J. Beazell
BY: 10-30-13 DATE

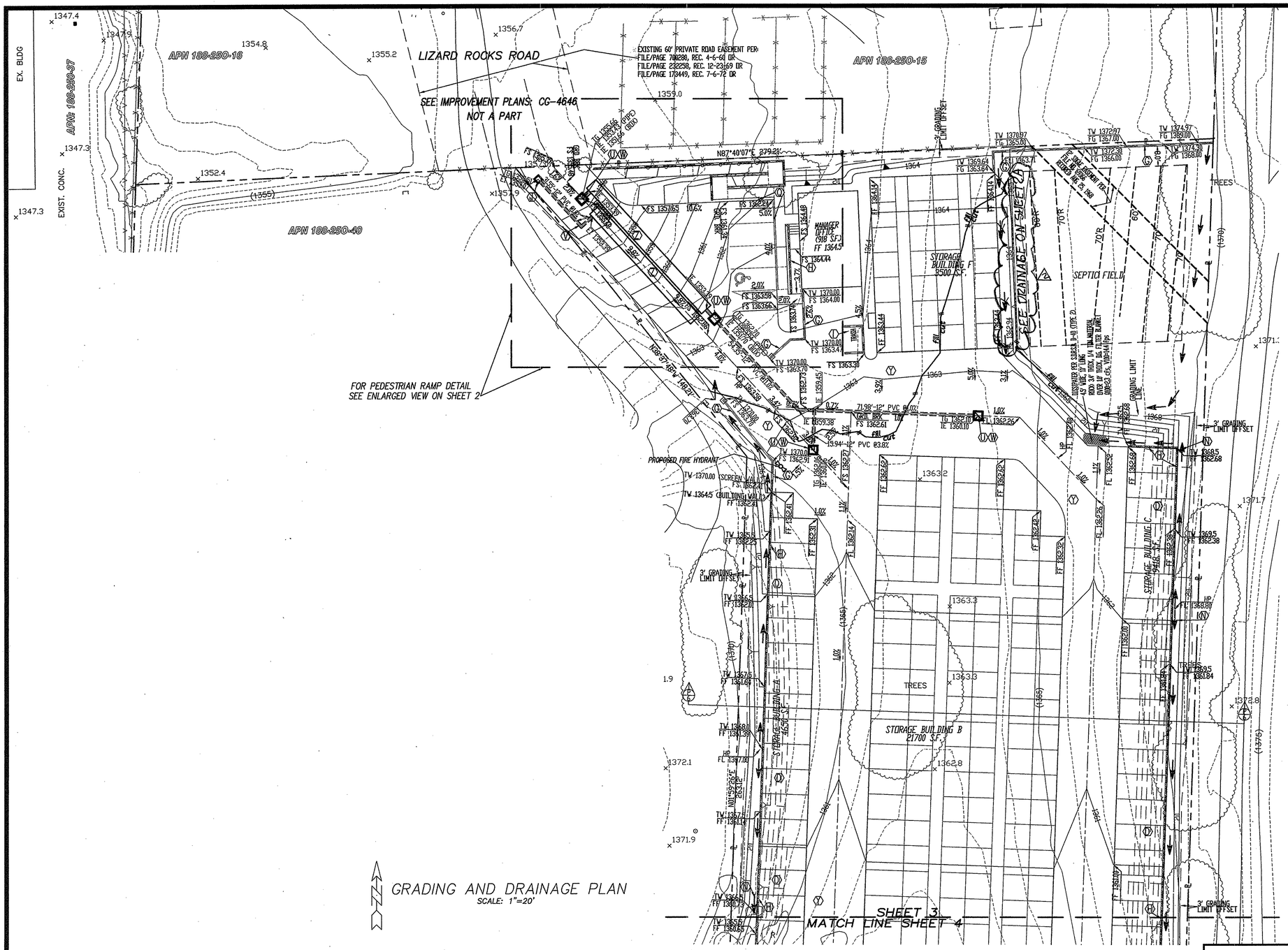
ENGINEER OF WORK [signature] DATE 1/7/13
GARY LIPSKA R.C.E. 23080 EXPIRES 12/31/13

CHECKED BY: N/A
APPROVAL DATE: 10-30-13
GRADING PERMIT NO. L–14940

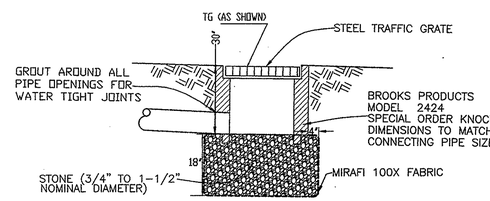
NEW SHEET

PLOT DATE: 1/07/13

ENGINEER: AQUATERRA ENGINEERING INC.
TELEPHONE: 760-439-2802



GRADING AND DRAINAGE PLAN
SCALE: 1"=20'



PAINT NOTE: ALL STEEL COVERS SHALL BE CLEANED, PRIMED AND PAINTED BLACK WITH URETHANE PAINT PER SECTION 310-2 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.

H/3 DISCHARGE BASIN
NO SCALE

CONSTRUCTION LEGEND

(D) TEMPORARY GRADED SLOPES PRIOR TO CONSTRUCTION OF BUILDING WALL
(E) CONCRETE DRIVEWAY PER S.D.R.S.D. G-14A
(F) MASONRY RETAINING WALL PER S.D.R.S.D. C-3
(G) 6' HIGH MASONRY SLUMP BLOCK SCREEN WALL (PER SEPARATE PERMIT)
(H) MASONRY RETAINING WALL PER ARCHITECTS PLAN (PER SEPARATE PERMIT)
(I) TRASH ENCLOSURE WITH DECORATIVE MASONRY SCREEN WALL (PER SEPARATE PERMIT)
(J) DISCHARGE BASIN PER DETAIL 'H' ON THIS SHEET
(K) DETENTION BASIN STAND PIPE OUTLET PER DETAIL 'C' ON SHEET 2
(M) TYPE 'F' CATCH BASIN PER S.D.R.S.D. D-7
(N) CONCRETE BROW DITCH PER S.D.R.S.D. D-75, TYPE B
(P) CONCRETE HEADWALL PER S.D.R.S.D. D-34
(Q) 6" CONCRETE CURB PER S.D.R.S.D. G- (6")
(R) NOT USED
(U) NO. 3636 BROOKS PRODUCTS WITH TRAFFIC GRATE PER DETAIL 'B' ON SHEET 2
(V) PVC DRAINAGE PIPE, SIZE AS SHOWN ON PLAN
(W) INSTALL CATCH BASIN INSERTS WITH FILTER MEDIA PER DETAIL 'E' ON SHEET 16
~~(W) INSTALL "FOSSIL FILTER - FLO GARD" CATCH BASIN INSERT AS MANUFACTURED BY KRISTAR ENTERPRISES, INC., SANTA ROSA, CA - 800-579-8819~~
(Y) CONCRETE PAVEMENT
(Z) STORM CHAMBER, AS MANUFACTURED BY HYDROLOGIC SOLUTIONS (877-426-9128)

ENGINEER'S NOTES

1) ALL PVC DRAINAGE PIPES SHALL CONFORM TO SDR-35 PER ASTM D3034, OR "SURE-LOK F477" AS MANUFACTURED BY NANCOR INC (AASHTO M252, TYPE S)
2) LENGTHS ON DRAINAGE PIPE ARE FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE.
3) CONTRACTOR TO VERIFY HORIZONTAL AND VERTICAL LOCATION OF EXISTING UNDERGROUND SEWER AND STORM DRAINAGE SYSTEMS PRIOR TO TRENCHING FOR NEW CONNECTING FACILITIES. IN THE EVENT ACTUAL LOCATION VARIES SIGNIFICANTLY FROM THAT SHOWN ON PLAN, THE ENGINEER OF WORK SHALL BE NOTIFIED PRIOR TO PROCEEDING

SYMBOL LEGEND

DESCRIPTION	SYMBOL
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ELEVATION, BOTTOM OF FOOTING	BF
ELEVATION, FLOW LINE	FL
ELEVATION, INVERT ELEVATION	IE
ELEVATION LABEL, EXISTING	(596.00)
ELEVATION LABEL, PROPOSED	596.00
ELEVATION FINISH FLOOR	FF
DETAIL REFERENCE	C/2X DETAIL LABEL / SHEET NO.

REGISTERED PROFESSIONAL ENGINEER GARY LIPSKA No. 23080 CIVIL STATE OF CALIFORNIA
EXPIRES 12/31/13

20 0 20 40
Scale: 1" = 20'

Aquaterra Engineering Inc.
CIVIL ENGINEERING • LAND PLANNING
1843 Campesino Place
Oceanside, CA 92054
Tele: (760) 439-2802
Fax: (760) 439-2866

RECORD PLAN
NAME
BY: [signature] DATE: 10/2/12
R.C.E. 23080
EXPIRES: 12/31/13

COUNTY APPROVED CHANGES

NO.	DESCRIPTION:	APPROVED BY:	DATE:
1	REVISE LEGEND & SHEET COUNT	[signature]	3/11/2013
2	ADD DRAINAGE NOTES RECORD PLAN	KJB	10/30/13

PERMITS
REZONE PERMIT NO. N/A
SITE PLAN REVIEW NO. S-03-026
STREET IMPROVEMENT PLANS CG 4646
NOTICE OF INTENT(WDID): 9 37C339975

BENCH MARK
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RECORD FROM: NGVD 29
ELEVATION: 1349.30 DATUM: M.S.L.

PRIVATE CONTRACT

SHEET	COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS	SHEETS
3		16

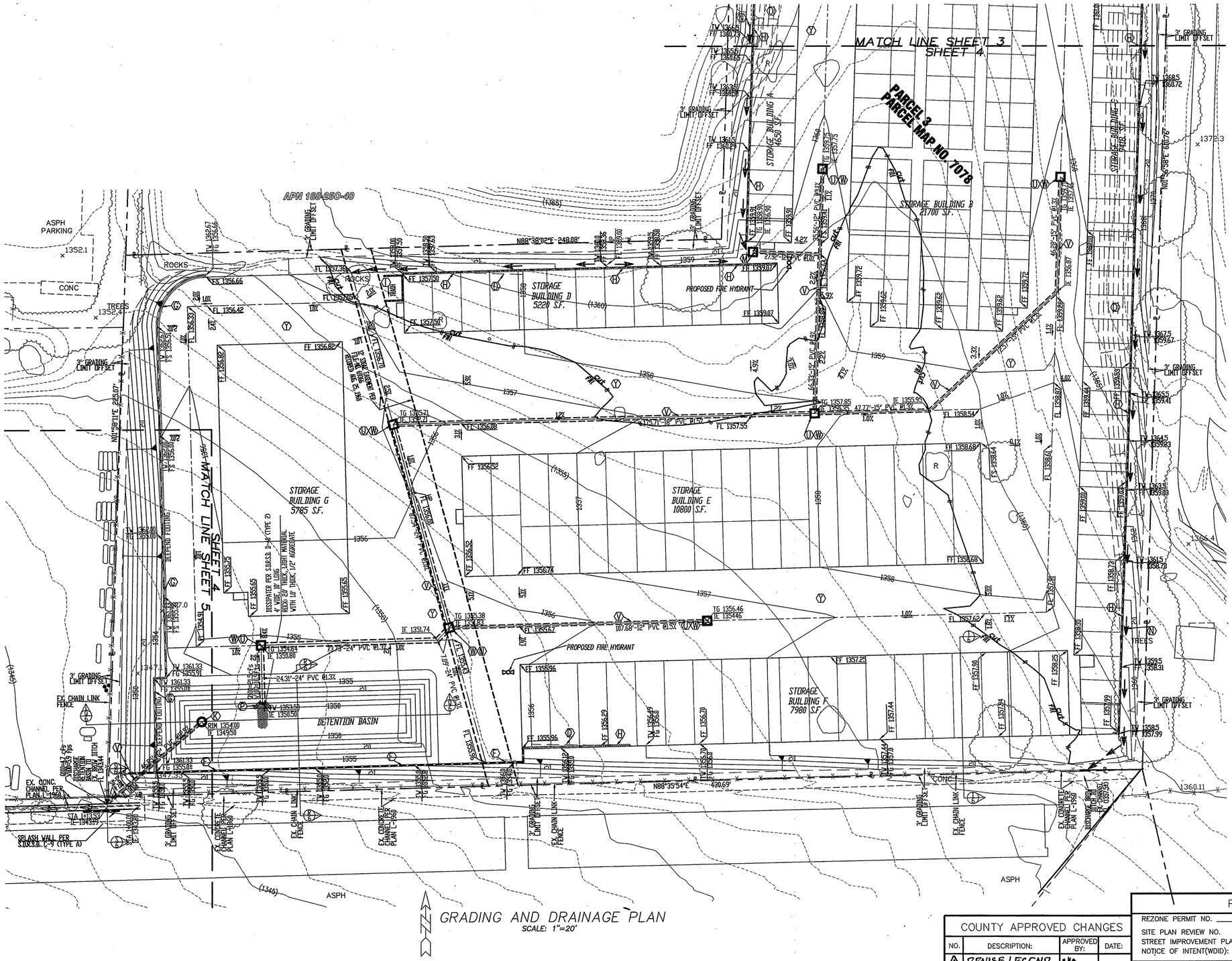
GRADING PLAN FOR:
LIZARD ROCKS STORAGE
PARCEL 3, PARCEL MAP NO. 7078
CALIFORNIA COORDINATE INDEX 386-1761

APPROVED FOR: MOHAMAD FAKHRIDDINE COUNTY ENGINEER
BY: [signature] DATE: 11.4.06

ENGINEER OF WORK: GARY LIPSKA R.C.E. 23080 EXPIRES 12/31/13
CHECKED BY:
ORIGINAL DATE:
GRADING PERMIT NO. L-14940

ENGINEER: AQUATERRA ENGINEERING INC.
TELEPHONE: 760-439-2802

PLOT DATE: 11/5/06



CONSTRUCTION LEGEND

- (D) TEMPORARY GRADED SLOPES PRIOR TO CONSTRUCTION OF BUILDING WALL
- (E) CONCRETE DRIVEWAY PER S.D.R.S.D. G-14A
- (F) MASONRY RETAINING WALL PER S.D.R.S.D. C-3
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- (I) TRASH ENCLOSURE WITH DECORATIVE MASONRY SCREEN WALL (PER SEPARATE PERMIT)
- (J) DISCHARGE BASIN PER DETAIL H ON SHEET 3 2
- (K) DETENTION BASIN STAND PIPE OUTLET PER DETAIL 'C' ON SHEET 2
- (M) TYPE 'F' CATCH BASIN PER S.D.R.S.D. D-7
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- (R) NOT USED
- (U) NO. 3636 BROOKS PRODUCTS WITH TRAFFIC GRATE PER DETAIL 'B' ON SHEET 2
- (V) PVC DRAINAGE PIPE, SIZE AS SHOWN ON PLAN
- (W) INSTALL CATCH BASIN INSERTS WITH FILTE MEDIA PER DETAIL 'E' MANUFACTURED BY KONSTAR ENTERPRISES, INC., SANTA ROSA, CA. 888-579-8819 ON SHEET 16 2
- (Y) CONCRETE PAVEMENT
- (Z) STORM CHAMBER, AS MANUFACTURED BY HYDROLOGIC SOLUTIONS (877-426-9128)

SYMBOL LEGEND

DESCRIPTION	SYMBOL
ELEVATION, TOP OF FOOTING	TF
ELEVATION, TOP OF WALL	TW
ELEVATION, TOP OF CURB	TC
ELEVATION, FINISH SURFACE	FS
ELEVATION, FINISH GRADE	FG
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ELEVATION, FLOW LINE	FL
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ELEVATION LABEL, PROPOSED	596.00
ELEVATION FINISH FLOOR	FF
DETAIL REFERENCE	C' / 2 DETAIL LABEL / SHEET NO.

REGISTERED PROFESSIONAL ENGINEER GARY LIPSKA No. 23080 CIVIL STATE OF CALIFORNIA
EXPIRES 12/31/13

20 0 20 40
Scale: 1" = 20'

CIVIL ENGINEERING • LAND PLANNING
Aqualterra Engineering Inc.
1843 Campesino Place
Oceanside, CA 92054
Tele: (760) 439-2802
Fax: (760) 439-2866

COUNTY APPROVED CHANGES

NO.	DESCRIPTION:	APPROVED BY:	DATE:
1	REVISE LEGEND + SHEET COUNT	aka	3/14/2012
2	ADD DRAINAGE NOTES RECORD PLAN	KBB	10/30/13

RECORD PLAN

BY: [signature] NAME
R.C.E. 23080 DATE: 10/9/12
EXPIRES: 12/31/13

PERMITS

REZONE PERMIT NO. N/A
SITE PLAN REVIEW NO. S-03-026
STREET IMPROVEMENT PLANS CG 4646
NOTICE OF INTENT(WDID): 9 37C339975

BENCH MARK

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RECORD FROM: NGVD 29
ELEVATION: 1349.30 DATUM: M.S.L.

PRIVATE CONTRACT

SHEET 4 | COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS | 16 SHEETS

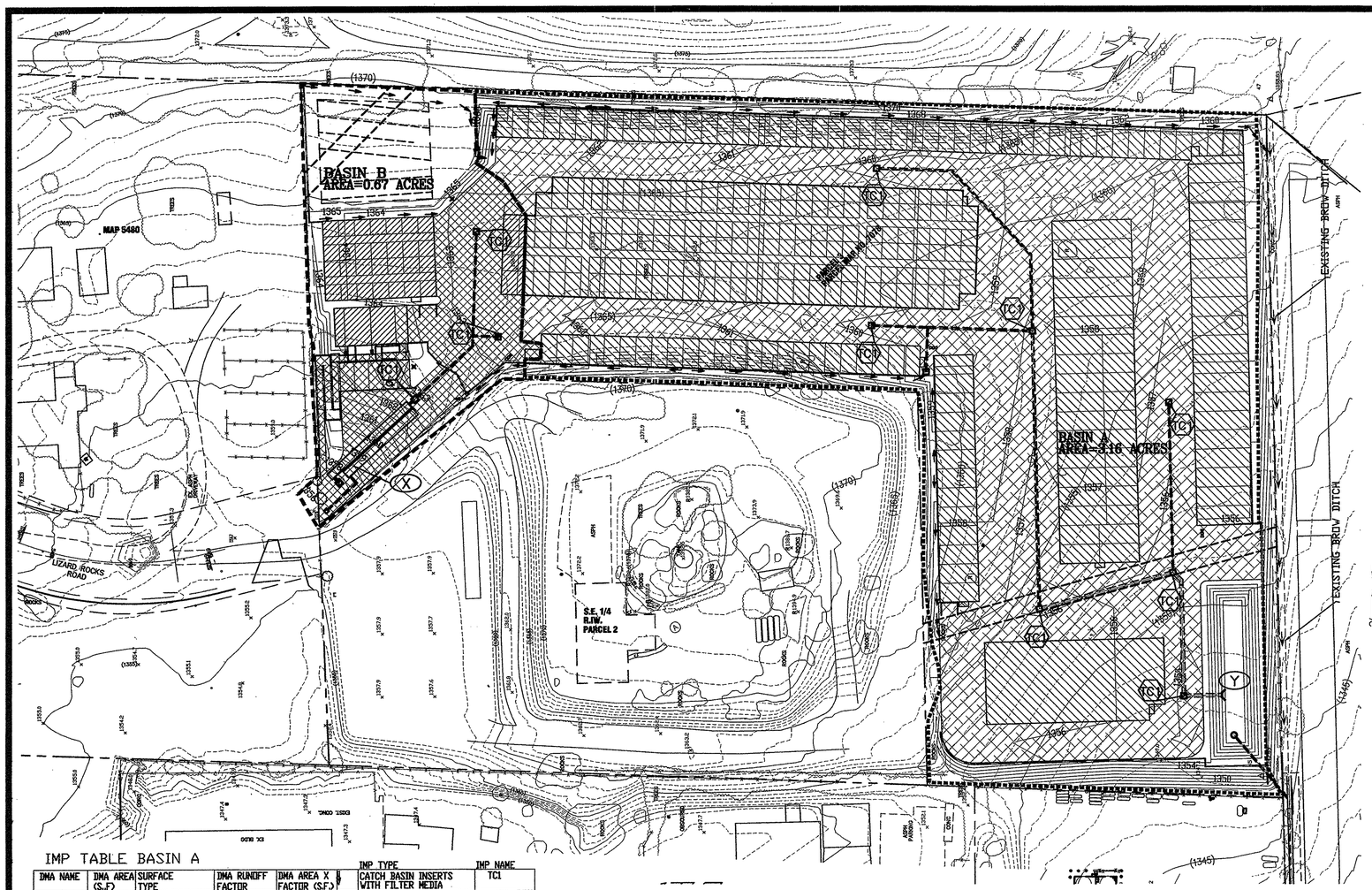
GRADING PLAN FOR:
LIZARD ROCKS STORAGE
PARCEL 3, PARCEL MAP NO. 7078
CALIFORNIA COORDINATE INDEX 386-1761

APPROVED FOR: MOHAMAD FAKHRIDDINE COUNTY ENGINEER
BY: Nasi Aveigat DATE: 11.9.06

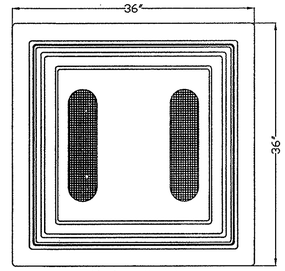
ENGINEER OF WORK: GARY LIPSKA R.C.E. 23080 EXPIRES 12/31/13
CHECKED BY:
APPROVAL DATE:
GRADING PERMIT NO. L-14940

ENGINEER: AQUATERRA ENGINEERING INC.
TELEPHONE: 760-439-2802

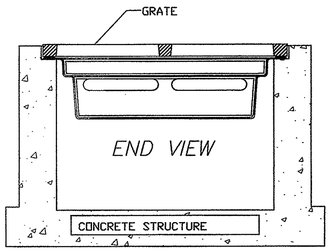
PLOT DATE: 11/5/06



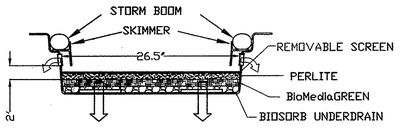
Part # GISB MEDIA FILTER-36-36-9



TOP VIEW

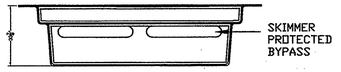


END VIEW



FLOW SCHEMATIC

SIDE VIEW



BOX MANUFACTURED FROM MARINE GRADE FIBERGLASS & GEL COATED FOR UV PROTECTION

5 YEAR MANUFACTURERS WARRANTY

PATENTED

ALL FILTER SCREENS ARE STAINLESS STEEL

BioMediaGREEN REMOVAL EFFICIENCIES	
Total Suspended Solids "Sil-Co-Sil 106"	85%
Total Phosphorus	69%
Ortho Phosophorus	41%
Dissolved Copper	79%
Dissolved Lead	98%
Dissolved Zinc	78%
Fecal Coliform Bacteria	68%
TPH	99%

NOTES:
1. ALL HARDWARE, FLANGE, AND SCREENS SHALL BE STAINLESS STEEL.
2. FILTER FRAME SHALL BE 100% MARINE GRADE FIBERGLASS WITH UV PROTECTION GEL COAT.
3. STORM BOOM SHALL BE 3" DIA. AND SHALL BE PLACED ABOVE THE BYPASS AND ORIENTATED IN A PERIMETER CONFIGURATION AROUND THE FILTER THROAT.

FLOW RATES - GISB FILTER		
TREATMENT FLOW RATE	0.11 cfs	
BYPASS FLOW RATE	4.17 cfs	ASSUMES 3.5" THICK GRATE ASSUMES 4" HEAD ABOVE GRATE
THROAT FLOW RATE	17.12 cfs	

***FLOW RATES CALCULATED USING THE FOLLOWING EQUATION*

$Q = SD * C_d * A * \sqrt{2 * g * h}$ C_d = COEFFICIENT OF DISCHARGE = .60

SUNTREE QUALITY PRODUCTS ARE BUILT FOR EASY CLEANING AND ARE DESIGNED TO BE PERMANENT INFRASTRUCTURE AND SHOULD LAST FOR DECADES.

Email: info@bioclean environmental.net

IMP TABLE BASIN A

DMA NAME	DMA AREA (S.F.)	SURFACE TYPE	DMA RUNOFF FACTOR	DMA AREA X FACTOR (S.F.)	IMP TYPE: CATCH BASIN INSERTS WITH FILTER MEDIA	IMP NAME: TC1
A1	55150	PAVEMENT	1.0	55150		
A2	62759	BUILDING	1.0	62759		
A3	19768	LANDSCAPING	0.1	1977		
			TOTAL	119886	IMP SIZING: 0.04	MINIMUM AREA (S.F.): 4795
						ACTUAL AREA (S.F.): **47,920

**EQUIVALENT SURFACE AREA OF CATCH BASIN INSERT (5990 S.F./INSERT X 8 INSERTS) = 47,920 S.F.
SEE WATER QUALITY CALCULATIONS IN ATTACHMENT "D" OF STORM WATER MANAGEMENT PLAN.

IMP TABLE BASIN B

DMA NAME	DMA AREA (S.F.)	SURFACE TYPE	DMA RUNOFF FACTOR	DMA AREA X FACTOR (S.F.)	IMP TYPE: CATCH BASIN INSERTS WITH FILTER MEDIA	IMP NAME: TC1
B1	11899	PAVEMENT	1.0	11899		
B2	5081	BUILDING	1.0	5081		
B3	12422	LANDSCAPING	0.1	1242		
			TOTAL	18222	IMP SIZING: 0.04	MINIMUM AREA (S.F.): 729
						ACTUAL AREA (S.F.): **17,970

**EQUIVALENT SURFACE AREA OF CATCH BASIN INSERT (5990 S.F./INSERT X 3 INSERTS) = 17,970 S.F.
SEE WATER QUALITY CALCULATIONS IN ATTACHMENT "D" OF STORM WATER MANAGEMENT PLAN.

(SWMP NOTES)

TREATMENT CONTROL BMPS

(TC1) – CATCH BASIN INSERTS WITH FILTER MEDIA PER DETAIL "Z" ON THIS SHEET.

FEATURE LEGEND

(X) UNDERGROUND DETENTION BASIN (FOR FLOW CONTROL ONLY)

(Y) OPEN PIT DETENTION BASIN (FOR FLOW CONTROL ONLY)

CIVIL ENGINEERING • LAND PLANNING
Aquaterra Engineering Inc.
1845 Campesino Place
Oceanside, CA 92054
Tele: (760) 439-2802
Fax: (760) 439-2866

DMA AND TREATMENT CONTROL EXHIBIT

SCALE: 1"= 40'

SURFACE LEGEND

PAVEMENT – BASIN A	
BUILDINGS – BASIN A	
LANDSCAPING – BASIN A	NO HATCH
PAVEMENT – BASIN B	
BUILDINGS – BASIN B	
LANDSCAPING – BASIN B	NO HATCH

SUMMARY TABLE FOR BASIN A

AREA NAME	POST-PROJECT SURFACE TYPE	DMA/IMP AREA (S.F.)	PROJECT AREA (ACRE)
DMA A1	PAVEMENT	55150	
DMA A2	BUILDING	62759	
DMA A3	LANDSCAPING	19768	
IMP BASIN A		4795	
TOTAL		142472	3.27

SUMMARY TABLE FOR BASIN B

AREA NAME	POST-PROJECT SURFACE TYPE	DMA/IMP AREA (S.F.)	PROJECT AREA (ACRE)
DMA B1	PAVEMENT	11899	
DMA B2	BUILDING	5081	
DMA B3	LANDSCAPING	12422	
IMP BASIN B		729	
TOTAL		30131	0.69

TOTAL SITE AREA (3.27 + 0.69) = 3.96 ACRES

(Z) DETAIL: CATCH BASIN INSERT WITH FILTER MEDIA

REGISTERED PROFESSIONAL ENGINEER GARY LIPSKY No. 23080 CIVIL STATE OF CALIFORNIA

RECORD PLAN
BY: (NAME) DATE: 10/9/12
R.C.E. 23080
EXPIRES: 12/31/13

COUNTY APPROVED CHANGES			
NO.	DESCRIPTION:	APPROVED BY:	DATE:
1	NEW SHEET		9/14/2012
2	RECORD PLAN	KJB	10/30/13

PERMITS
REZONE PERMIT NO. N/A
SITE PLAN REVIEW NO. 5-03-026
STREET IMPROVEMENT PLANS CG 4646
NOTICE OF INTENT(WDID): 9 37C339975

BENCH MARK
DESCRIPTION: MONUMENT NO. 1031 PER R.O.S 14689
2" IRON PIPE W/BRASS DISC MARKED "GPS KE31"
LOCATION: COLE GRADE ROAD, 68' W'LY OF VALLEY CENTER ROAD INTERSECTION
RECORD FROM: NGVD 29
ELEVATION: 1349.30 DATUM: M.S.L.

PRIVATE CONTRACT

SHEET 16 | COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS | 16 SHEETS

DMA AND TREATMENT CONTROL PLAN FOR:
LIZARD ROCKS STORAGE
PARCEL 3, PARCEL MAP NO. 7078
CALIFORNIA COORDINATE INDEX 386-1761

APPROVED FOR: MOHAMAD FAKHREDDINE, COUNTY ENGINEER
BY: Kenneth J. Brazell DATE: 10-30-13
ENGINEER OF WORK: DATE: 3/6/12 GARY LIPSKY, RCE 23080 EXPIRES 12/31/13
CHECKED BY:
APPROVAL DATE:
GRADING PERMIT NO. L-14940

PROJECT: BIO CLEAN ENVIRONMENTAL SERVICE		REVISIONS:	DATE:
PO BOX 869 OCEANSIDE CA 92049			
760-433-7640 FAX:760-433-3176		REVISIONS:	DATE:
GRATE INLET SKIMMER BOX FOR INLET STRUCTURES.		REVISIONS:	DATE:
DATE:07/22/09	SCALE:SF = 15	REVISIONS:	DATE:
DRAFTER: JJC	UNITS =INCHES	REVISIONS:	DATE:

ENGINEER: AQUATERRA ENGINEERING INC.
TELEPHONE: 760-439-2802

NEW SHEET

PLOT DATE: 03-06-12

GENERAL NOTES

1. A PERMIT SHALL BE OBTAINED FROM THE COUNTY DEPARTMENT OF PUBLIC WORKS FOR ANY WORK WITHIN THE STREET RIGHT-OF-WAY.
2. THE STRUCTRUAL SECTION SHALL BE IN ACCORDANCE WITH SAN DIEGO COUNTY STANDARDS AND AS APPROVED BY THE MATERIALS LABORATORY.
3. APPROVAL OF THESE IMPROVEMENT PLANS AS SHOWN DOES NOT CONSTITUTE APPROVAL OF ANY CONSTRUCTION OUTSIDE THE PROJECT BOUNDRY.
4. ALL UNDERGROUND UTILITIES WITHIN THE STREET RIGHT-OF-WAY SHALL BE CONSTRUCTED, CONNECTED AND TESTED PRIOR TO CONSTRUCTION OF BERM, CURB, CROSS GUTTER AND PAVING.
5. THE EXISTANCE AND LOCATION OF EXISTING UNDERGROUND FACILITIES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS TO THE BEST OF OUR KNOWLEDGE THERE ARE NO OTHER EXISTING FACILITIES EXCEPT AS SHOWN ON THESE PLANS. HOWEVER THE CONTRACTOR IS REQUIRED TO TAKE PRECAUTIONARY MEASURES TO PROTECT ANY EXIST ING FACILITY SHOWN HEREON AND ANY OTHER WHICH IS NOT OF RECORD OR NOT SHOWN ON THESE PLANS.
6. LOCATION AND ELEVATION OF IMPROVEMENTS TO BE MET BY WORK TO BE DONE SHALL BE CONFERMED BY FIELD MEASUREMENTS PRIOR TO CONSTRUC TION OF NEW WORK. CONTRACTOR WILL MAKE EXPLORATORY EXCAVATIONS AND LOCATE EXISTING UNDERGROUND FACILITIES SUFFICIENTLY AHEAD OF CON STRUCTION TO PERMIT REVISIONS TO PLANS IF REVISIONS ARE NECESSARY BECAUSE OF ACTUAL LOCATION OF EXSISTING FACILITES.
7. THE CONTRACTOR SHALL NOTIFY THE SAN DIEGO GAS AND ELECTRIC COMPANY PRIOR TO STARTING WORK NEAR COMPANY FACILITES AND SHALL COORDINATE HIS WORK WITH COMPANY REPRESENTATIVES.
   NOTICE: ALL ELECTRICAL AND GAS SERVICES WITHIN THIS PROJECT ARE "UNDERGROUND INSTALLATIONS." FOR LOCATIONS OF ELECTRICAL CABLES AND GAS PIPING AND APPURTENANCES CONTACT THE SAN DIEGO GAS AND ELECTRIC COMPANY.
   TELEPHONE: 619-293-0595
8. THE CONTRACTOR SHALL NOTIFY AMERICAN TELEPHONE AND TELEGRAPH PRIOR TO STARTING WORK NEAR COMPANY FACILITES AND SHALL COORDINATE HIS WORK WITH COMPANY REPRESENTATIVES.
   NOTICE: ALL TELEPHONE SERVICES WITHIN THIS PROJECT BOUNDARY ARE "UNDERGROUND INSTALLATIONS" FOR LOCATION OF CABLES AND APPURENANCES CONTACT AMERICAN TELEPHONE AND TELEGRAPH TELEPHONE: 1-800-422-4133
9. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER TO CONTACT THE UTILITY AGENCIES, ADVISE THEM OF THE PROPOSED IMPROVEMENTS AND BEAR THE COST OF RELOCATIONS, IF NEEDED.
10. ALL TELEVISION SERVICES WITHIN THIS PROJECT ARE "UNDERGROUND INSTALL ATIONS." FOR LOCATION OF CABLES AND APPURENANCES CONTACT ADELPHIA CABLE COMMUNICATIONS, TELEPHONE: 760-728-5002
11. POWER SOURCES AND RUNS SERVING STREET LIGHTS SHALL BE SHOWN ON THE "AS-BUILT " IMPROVEMENT DRAWINGS. ALL SOURCES SHALL BE LOCATED WITHIN THE DEDICATED RIGHT-OF-WAY, OR WITHIN EASEMENTS DEDICATED TO THE COUNTY OF SAN DIEGO.
12. NO PAVING SHALL BE DONE UNTIL EXISTING POWER POLES ARE RELOCATED OUTSIDE THE AREAS TO BE PAVED.
13. PRIVATE ROAD IMPROVEMENTS SHOWN HEREON ARE FOR INFORMATION ONLY. COUNTY OFFICIALS SIGNATURE HEREON DOES NOT CONSTITUTE APPROVAL OR RESPONSIBILITY OF ANY KIND FOR THE DESIGN OR CONSTRUCTION OF THESE PRIVATE IMPROVEMENTS.
14. ALL CUT AND FILL SLOPES OVER THREE (3) FEET CREATED BY GRADING FOR STREETS AND DRIVEWAYS SHALL BE HYDROSEEDED WITH SAN DIEGO COUNTY APPROVED HYDROSEED MIXTURE. HYDROSEEDED SLOPES SHALL BE IRRIGATED BY WATER TRUCK UNTIL THE MIXTURE GERMINATES AND GROWTH IS ESTABLISHED.
15. ALL INTERSECTING ROADS AND DRIVEWAYS SHALL BE GRADED AND/ OR RECONSTRUCTED, AS REQUIRED TO MATCH NEW IMPROVEMENTS AND PROVIDE SMOOTH TRANSITION
16. ALL TREES WITHIN THE RIGHT-OF-WAY SHALL BE REMOVED.

GENERAL NOTES (CONTINUED)

17. ALL SIGNS TO BE ALUMINUM WITH 3M HIGH INTENSITY TYPE REFLECTIVE FACE OR EQUIVALENT.
18. CONTRACTOR WILL BE RESPONSIBLE FOR THE REPLACEMENT OF ANY STRIPING, PAVEMENT MARKERS OR LEGENDS OBLITERATED BY THE CONSTRUCTION OF THIS PROJECT.
19. ALL NEW STRIPING AND SANDBLASTING OF REDUNDANT STRIPING SHALL BE DONE BY THE CONTRACTOR.
20. ALL CUT AND FILL SLOPES THREE FEET (3') CREATED BY GRADING FOR STREETS AND DRIVEWAYS SHALL BE HYDROSEEDED WITH A SAN DIEGO COUNTY APPROVED HYDROSEED MIXTURE. HYDROSEEDED SLOPES SHALL BE IRRIGATED BY A WATER TRUCK UNTIL THE MIXTURE GERMINATES AND GROWTH IS ESTABLISHED.
21. ASPHALT CONCRETE SURFACING MATERIAL SHALL BE HAND-RAKED AND COMPACTED TO FORM SMOOTH TAPERED CONNECTIONS ALONG ALL EDGES INCLUDING THOSE EDGES ADJACENT TO SOIL. THE EDGES OF ASPHALT CONCRETE SHALL BE HAND-RAKED AT 45 DEGREES OR FLATTER, SO AS TO PROVIDE A SMOOTH TRANSITION NEXT TO THE EXISTING SOIL, INCLUDING THOSE AREAS SCHEDULED FOR SHOULDER BACKING. THE ABOVE SHALL BE DONE TO THE SATISFACTION OF THE DIRECTOR OF PUBLIC WORKS.
22. CONTRACTOR SHALL APPLY FOR A TRAFFIC CONTROL PERMIT TWO WEEKS PRIOR TO COMMENCEMENT OF WORK. NO WORK SHALL COMMENCE UNTIL ISSUANCE OF SAID PERMIT. FOR INFORMATION CALL (858) 874-4025. THE TRAFFIC CONTROL PERMIT SHALL REQUIRE SPECIFICATIONS FOR THE INFORMATIONAL SIGNS.

BMP STENCIL PLACEMENT NOTES

A) ALL STORM DRAIN INLETS AND CATCH BASINS WITHIN THE PROJECT SHALL HAVE A STENCIL OR TILE PLACED WITH PROHIBITIVE LANGUAGE, SUCH AS "NO DUMPING- I LIVE IN THE PACIFIC OCEAN" AND/OR GRAPHICAL ICONS TO DISCOURAGE ILLEGAL DUMPING.

B) SIGNS AND PROHIBITIVE LANGUAGE AND/OR GRAPHICAL ICONS, WHICH PROHIBIT ILLEGAL DUMPING, MUST BE POSTED AT PUBLIC ACCESS POINTS ALONG CHANNELS AND CREEKS WITHIN THE PROJECT AREA.

C) LEGIBILITY OF STENCILS, TILES AND SIGNS MUST BE MAINTAINED AND THE TILES MUST BE PLACED FLUSH WITH THE TOP OF CONCRETE TO REDUCE TRIPPING BY PEDESTRIANS.

NOTICE: THE ISSUANCE OF THIS PERMIT/ APPROVAL BY THE COUNTY OF SAN DIEGO DOES NOT AUTHORIZE THE APPLICANT FOR SAID PERMIT / APPROVAL TO VIOLATE ANY FEDERAL, STATE OR COUNTY LAWS, ORDINANCES, REGULATIONS OR POLICIES INCLUDING BUT NOT LIMITED TO THE FEDERAL ENDANGERED SPECIES ACT AND ANY AMENDMENTS THERETO.

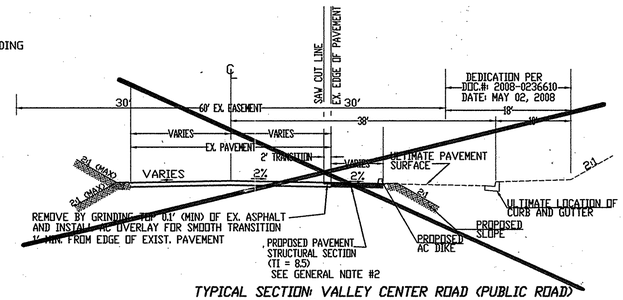
EXISTING UTILITY FACILITY NOTE

THE CONTRACTOR SHALL VERIFY THE EXISTENCE AND LOCATION OF ALL UTILITIES BEFORE COMMENCING WORK. NOTICE OF PROPOSED WORK SHALL BE GIVEN TO THE FOLLOWING AGENCIES:

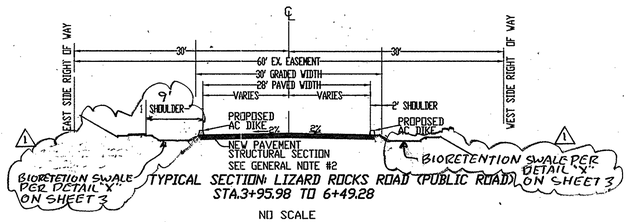
SAN DIEGO GAS & ELECTRIC:	TELEPHONE NO. 619-232-4252, EXT. 1658
A.T.& T.	TELEPHONE NO: 619-296-0595
CATV: ADELPHIA CABLE COMMUNICATIONS,	TELEPHONE: 760-728-5002
WATER: VALLEY CENTER MUNICIPAL WATER DISTRICT	TELEPHONE NO: 760- 735-4500
DIG ALERT:	TELEPHONE NO: 1-800-422-4133

DIG ALERT NOTICE

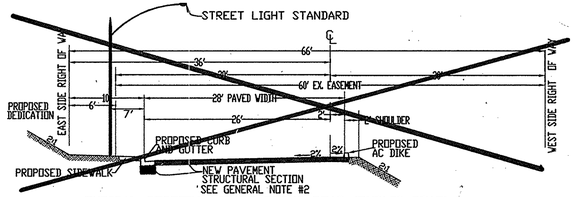
2 DAYS PRIOR TO EXCAVATION, THE CONTRACTOR SHALL CONTACT UNDERGROUND SERVICE ALERT AT 1-800-422-4133 TO MARK OUT EXISTING UNDERGROUND FACILITIES WITHIN THE WORK AREA.



TYPICAL SECTION: VALLEY CENTER ROAD (PUBLIC ROAD)
NO SCALE
SEE CG-4526



TYPICAL SECTION: LIZARD ROCKS ROAD (PUBLIC ROAD)
STA.3+95.98 TO 6+49.28
NO SCALE



TYPICAL SECTION: LIZARD ROCKS ROAD (PUBLIC ROAD)
STA. 1+80.48 TO 3+95.98
NO SCALE
SEE:CG-4526

WORK TO BE DONE

IMPROVEMENTS CONSIST OF THE FOLLOWING WORK TO BE DONE ACCORDING TO THESE PLANS, THE CURRENT SAN DIEGO COUNTY DEPARTMENT OF PUBLIC WORKS STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS FOR IMPROVEMENT OF SUB-DIVISION STREETS AND STANDARD REFERENCE DRAWINGS.

LEGEND

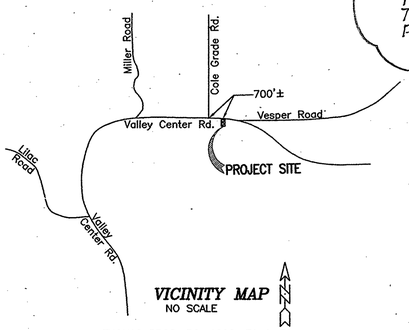
DESCRIPTION	DWG.NO.
AC PAVEMENT - AS APPROVED BY MATERIALS LABORATORY	
CONCRETE CURB	S.D.R.S.D. NO. G-1 (6")
~~CONCRETE CURB AND GUTTER~~	~~S.D.R.S.D. G-2 (TYPE G)~~
~~CONCRETE SIDEWALK~~	~~S.D.R.S.D. G-7, G-9, G-10~~
~~PEDESTRIAN RAMP~~	~~S.D.R.S.D. G-27 (TYPE A), G-32~~
~~CONCRETE DRIVEWAY~~	~~S.D.R.S.D. G-14B~~
6" DIKES-ASPHALT CONCRETE	S.D.R.S.D. G-5 (TYPE A)
STORM DRAIN PIPE (SIZE AS SHOWN)	
~~SIDEWALK UNDERDRAIN~~	~~S.D.R.S.D. D-25~~
~~STREET LIGHT (250 WATTS, H.P.S.)~~	~~S.D.R.S.D. E-1, E-2~~
CONCRETE BROW DITCH PER S.D.R.S.D. D-75 (TYPE "D")	S.D.R.S.D. D-75 (TYPE "D")
GRASS LINED SWALE	DETAIL "W" ON SHEET 3
WATER SERVICE CONNECTION	V.C.M.W.D. DWG. W-2
FIRE HYDRANT	V.C.M.W.D. DWG. W-8
STREET SURVEY MONUMENT	S.D.R.S.D. M-10
STREET SIGNS	-
DOUBLE STREET NAME SIGNS	-
CUT SLOPE (2:1 MAX)	
FILL SLOPE (2:1 MAX)	
CUT/FILL DAYLIGHT LINE	
AC OVERLAY FOR SMOOTH TRANSITION	
REMOVE TOP 0.1' OF EX. ASPHALT AND INSTALL AC OVERLAY FOR SMOOTH TRANSITION	
CONCRETE PAVEMENT	
BIORETENTION SWALE	DETAIL "X", SHEET 3
CATCH BASIN, TYPE "F"	S.D.R.S.D. D-7
CATCH BASIN, TYPE "G"	S.D.R.S.D. D-8
INFILTRATION BASIN	DETAIL "T", SHEET 3

INDEX OF SHEETS

STORMWATER TREATMENT BMP TABLE			
DESCRIPTION/TYPE	SHEET NO.	MAINTENANCE CATEGORY	REVISIONS
BIORETETION SWALE	2&3&9	FOUR	

BMP'S APPROVED AS PART OF THE STORMWATER MANAGEMENT PLAN DATED 7/26/12. ON FILE WITH DPW. ANY CHANGES TO THE ABOVE BMP'S WILL REQUIRE SWMP REVISION AND PLAN CHANGE APPROVAL

REGISTERED PROFESSIONAL ENGINEER GARY LIPSKA No. 23080 CIVIL STATE OF CALIFORNIA



VICINITY MAP
NO SCALE
THOMAS BROS. PG. 1090, F1 & F2

VALLEY CENTER MUNICIPAL WATER DISTRICT

VALID FOR 1 YEAR FROM THE DATE OF SIGNATURE

GENERAL MANAGER — DATE: 3/13/09

DIRECTOR OF OPERATIONS FACILITIES — DATE: 3-12-09

DISTRICT ENGINEER — DATE: 3.12.09

VCMWD APPROVED CHANGES

NO.	DESCRIPTION:	APPROVED BY:	DATE:
1	UPDATE SHEETS 1 AND 11		4.2.12

VALLEY CENTER FIRE PROTECTION DISTRICT

APPROVED BY: — DATE: 3.23.09

DECLARATION OF RESPONSIBLE CHARGE

I HEREBY DECLARE THAT I AM THE ENGINEER OF WORK FOR THIS PROJECT, THAT I HAVE EXERCISED RESPONSIBLE CHARGE OVER THE DESIGN OF THE PROJECT AS DEFINED IN SECTION 6703 OF THE BUSINESS AND PROFESSIONS CODE, AND THAT THE DESIGN IS CONSISTENT WITH CURRENT STANDARDS.

I UNDERSTAND THAT THE CHECK OF PROJECT DRAWINGS AND SPECIFICATIONS BY THE COUNTY OF SAN DIEGO IS CONFINED TO REVIEW ONLY AND DOES NOT RELIEVE ME, AS ENGINEER OF WORK, OF MY RESPONSIBILITIES FOR PROJECT DESIGN.

BY: GARY LIPSKA — DATE: 5/4/12 (4/27/12)

RCE NO: 23080 EXPIRES: 12/31/13 (12/31/09)

ENGINEER OF WORK

NAME: AQUATERRA ENGINEERING INC.

PHONE NO: 760-439-2802, FAX: 760-430-2866

ADDRESS: 1843 CAMPESINO PLACE, OCEANSIDE, CA 92054

LEGAL DESCRIPTION

PARCEL 3, PARCEL MAP NO. 7078

ASSESSORS PARCEL NO. 188-250-41

COUNTY APPROVED CHANGES

NO.	DESCRIPTION	APPROVED BY	DATE
1	NEW OWNER, REPLACE SHEET 2&3, REVISE SHEETS 4-6, ADD BMP TABLE & SHEETS 9, 10 & 11; REVISE SHEET COUNT UPDATE LICENSE DATE		8/2/2012
2	DELETE SHEETS 7&8 VOID SHT.11, ADD SHT.11A	K9B	11/6/12
3	REVISE SHT.9, RECORD PLAN	K9B	1/16/14

RECORD PLAN

NAME: GARY LIPSKA

R.C.E. 23080 EXPIRES 12/31/13

DATE: 10/14/13

OWNER/PERMITTEE

PERMITTEE: CML-CA LIZARD ROCK LLC PHONE: 949-389-1410
ADDRESS: 700 NORTH WEST 107TH AVE, MIAMI, FL, 33172
BY: M. Jaily MIKE FARLEY DATE 5/18/12 APN: 188-250-41

OWNER'S/PERMITTEE'S CERTIFICATE

IT IS AGREED THAT FIELD CONDITIONS MAY REQUIRE CHANGES TO THESE PLANS.

IT IS FURTHER AGREED THAT THE PERMITTEE (DEVELOPER) SHALL HAVE A REGISTERED CIVIL ENGINEER MAKE SUCH CHANGES ALTERATIONS OR ADDITIONS TO THESE PLANS WHICH THE DIRECTOR OF PUBLIC WORKS DETERMINES ARE NECESSARY AND DESIRABLE FOR THE PROPER COMPLETIONS OF THE IMPROVEMENTS.

I FUTHER AGREE TO COMMENCE WORK ON ANY IMPROVEMENTS SHOWN ON THESE PLANS WITHIN EXISTING COUNTY RIGHT-OF-WAY WITHIN 60 DAYS AFTER ISSUANCE OF THE CONSTRUCTION PERMIT AND TO PURSUE SUCH WORK ACTIVELY ON EVERY NORMAL WORKING DAY UNTIL COMPLETED.

OWNER/PERMITTEE ~~PERMITTEE: LIZARD ROCK LLC~~ SEE ABOVE PHONE NO: 760-749-6060
ADDRESS: 27606 COBB LANE, VALLEY CENTER, CA 92082
BY: DATE 5/3/09 APN 188-250-41
JOE GALLAGHER PRESIDENT OF MSK MANAGEMENT INC., MANAGER

PERMITS

AEIS NO.	03-08-029
SITE PLAN REVIEW NO.	S-03-026
GRADING PLAN	I-14940
NOTICE OF INTENT	9 37C353626

BENCH MARK

DESCRIPTION: MONUMENT NO. 1031 PER R.O.S 14689
2" IRON PIPE W/BRASS DISC MARKED "GPS KE31"
LOCATION: COLE GRADE ROAD, 68' W'LY OF VALLEY CENTER ROAD INTERSECTION
RECORD FROM: NGVD 29
ELEVATION: 1349.30 DATUM: M.S.L.

PRIVATE CONTRACT

SHEET 1 | COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS | 13 SHEETS

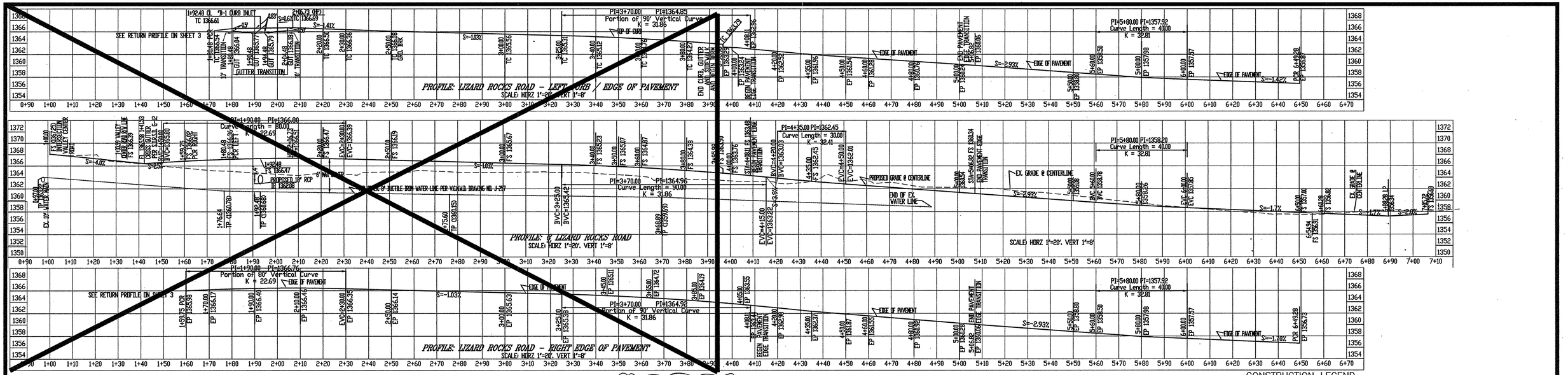
IMPROVEMENT PLAN FOR:
LIZARD ROCKS ROAD
PARCEL 3, PARCEL MAP NO. 7078
CALIFORNIA COORDINATE INDEX 386-1761

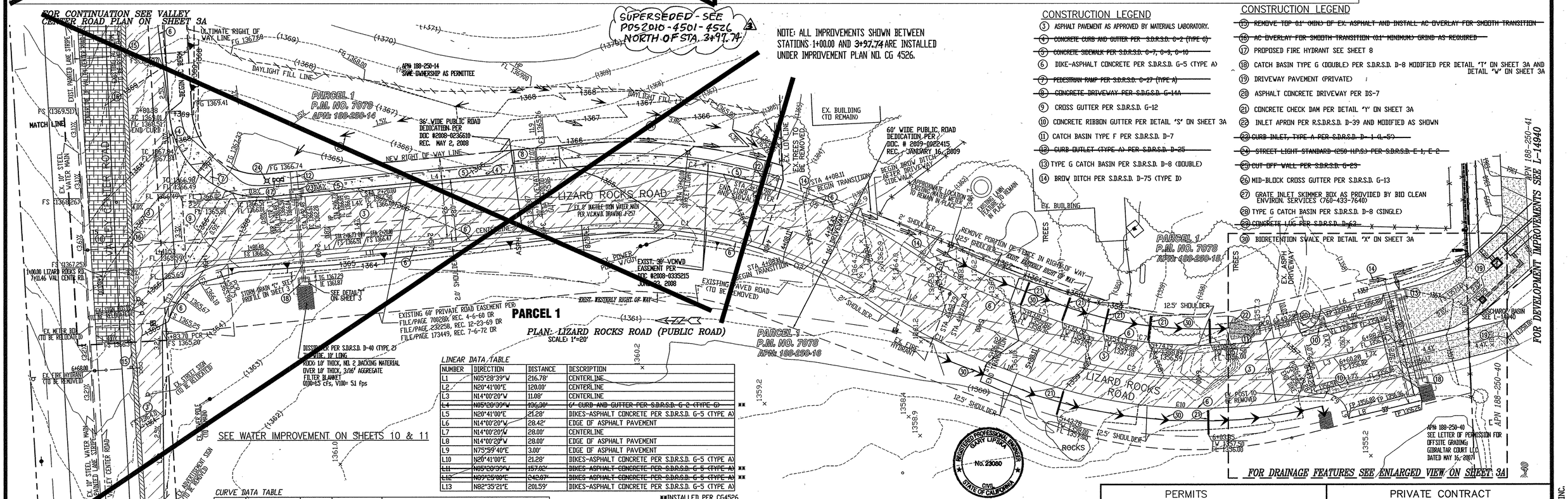
APPROVED FOR: MOHAMAD FAKHRIDDINE, COUNTY ENGINEER
BY: DATE 7/1/14

ENGINEER OF WORK: GARY LIPSKA, R.C.E. 23080 DATE 4/27/09
CHECKED BY: APPROVAL DATE: IMPROVEMENT PLAN NO. CG 4646

ENGINEER: AQUATERRA ENGINEERING INC.
TELEPHONE: 760-439-2802

PDS2013-LDPCHG-00056 PLOT DATE: 2/26/09





DISSIPATER PER S.D.R.S.D. D-40 (TYPE 2)
TRENCH DIKE, 10' LONG
ROCK 10' THICK, NO. 2 BACKING MATERIAL OVER 10' THICK, 3/16" AGGREGATE FILTER BLANKET
Q100=15 CFS, V100= 5.1 fps

LINEAR DATA TABLE

NUMBER	DIRECTION	DISTANCE	DESCRIPTION
L1	N05°28'39"W	216.78'	CENTERLINE
L2	N20°41'00"E	120.00'	CENTERLINE
L3	N14°00'20"W	11.08'	CENTERLINE
L4	N05°28'39"W	196.39'	6" CURB AND GUTTER PER S.D.R.S.D. G-2 (TYPE G) **
L5	N20°41'00"E	21.28'	DIKES-ASPHALT CONCRETE PER S.D.R.S.D. G-5 (TYPE A)
L6	N14°00'20"W	28.42'	EDGE OF ASPHALT PAVEMENT
L7	N14°00'20"W	28.00'	CENTERLINE
L8	N14°00'20"W	28.00'	EDGE OF ASPHALT PAVEMENT
L9	N75°59'40"E	3.00'	EDGE OF ASPHALT PAVEMENT
L10	N20°41'00"E	21.28'	DIKES-ASPHALT CONCRETE PER S.D.R.S.D. G-5 (TYPE A)
L11	N05°28'39"W	157.82'	DIKES-ASPHALT CONCRETE PER S.D.R.S.D. G-5 (TYPE A) **
L12	N69°25'08"E	242.07'	DIKES-ASPHALT CONCRETE PER S.D.R.S.D. G-5 (TYPE A) **
L13	N82°35'21"E	201.59'	DIKES-ASPHALT CONCRETE PER S.D.R.S.D. G-5 (TYPE A)

**INSTALLED PER CG4526

CURVE DATA TABLE

NUMBER	DELTA ANGLE	RADIUS	ARC LENGTH	DESCRIPTION
C1	26°09'48"	200.00	91.33	CENTERLINE
C2	34°41'20"	200.00	121.09	CENTERLINE
C3	92°06'28"	40.00	64.30	6" CURB AND GUTTER PER S.D.R.S.D. G-2 (TYPE G) **
C4	22°41'13"	226.00	89.48	6" CURB AND GUTTER PER S.D.R.S.D. G-2 (TYPE G) **
C5	17°20'24"	226.00	68.40	DIKES-ASPHALT CONCRETE PER S.D.R.S.D. G-5 (TYPE A)
C6	13°51'50"	186.00	45.02	DIKES-ASPHALT CONCRETE PER S.D.R.S.D. G-5 (TYPE A)
C7	34°41'20"	186.00	112.61	DIKES-ASPHALT CONCRETE PER S.D.R.S.D. G-5 (TYPE A)
C8	74°36'01"	11.00	14.32	EDGE OF ASPHALT PAVEMENT
C9	90°25'37"	11.00	17.36	EDGE OF ASPHALT PAVEMENT
C10	34°41'20"	214.00	129.56	DIKES-ASPHALT CONCRETE PER S.D.R.S.D. G-5 (TYPE A)
C11	13°51'45"	214.00	51.78	DIKES-ASPHALT CONCRETE PER S.D.R.S.D. G-5 (TYPE A)
C12	40°01'33"	198.00	138.32	DIKES-ASPHALT CONCRETE PER S.D.R.S.D. G-5 (TYPE A)
C13	00°20'20"	92.00	44.94	DIKES-ASPHALT CONCRETE PER S.D.R.S.D. G-5 (TYPE A) **

SYMBOL LEGEND

DESCRIPTION	SYMBOL
ELEVATION, TOP OF FOOTING	TF
ELEVATION, TOP OF WALL	TW
ELEVATION, TOP OF CURB	TC
ELEVATION, FINISH SURFACE	FS
ELEVATION, FINISH GRADE	FG
ELEVATION, TOP OF GRATE	TG
ELEVATION, BOTTOM OF FOOTING	BF
ELEVATION, FLOW LINE	FL
ELEVATION, INVERT ELEVATION	IE
ELEVATION LABEL, EXISTING	(596.00)
ELEVATION LABEL, PROPOSED	596.00
DETAIL REFERENCE	C/2 DETAIL LABEL / SHEET NO.

CONSTRUCTION LEGEND

(3) ASPHALT PAVEMENT AS APPROVED BY MATERIALS LABORATORY.
~~(4) CONCRETE CURB AND GUTTER PER S.D.R.S.D. G-2 (TYPE G)~~
~~(5) CONCRETE SIDEWALK PER S.D.R.S.D. G-7, G-9, G-10~~
(6) DIKE-ASPHALT CONCRETE PER S.D.R.S.D. G-5 (TYPE A)
~~(7) PEDESTRIAN RAMP PER S.D.R.S.D. G-27 (TYPE A)~~
~~(8) CONCRETE DRIVEWAY PER S.D.G.S.D. G-14A~~
(9) CROSS GUTTER PER S.D.R.S.D. G-12
(10) CONCRETE RIBBON GUTTER PER DETAIL 'S' ON SHEET 3A
(11) CATCH BASIN TYPE F PER S.D.R.S.D. D-7
~~(12) CURB OUTLET (TYPE A) PER S.D.R.S.D. D-25~~
(13) TYPE G CATCH BASIN PER S.D.R.S.D. D-8 (DOUBLE)
(14) BROW DITCH PER S.D.R.S.D. D-75 (TYPE D)

CONSTRUCTION LEGEND

~~(15) REMOVE TOP 0.1' (MIN) OF EX. ASPHALT AND INSTALL AC OVERLAY FOR SMOOTH TRANSITION~~
~~(16) AC OVERLAY FOR SMOOTH TRANSITION (0.1' MINIMUM) GRIND AS REQUIRED~~
(17) PROPOSED FIRE HYDRANT SEE SHEET 8
(18) CATCH BASIN TYPE G (DOUBLE) PER S.D.R.S.D. D-8 MODIFIED PER DETAIL 'T' ON SHEET 3A AND DETAIL 'W' ON SHEET 3A
(19) DRIVEWAY PAVEMENT (PRIVATE)
(20) ASPHALT CONCRETE DRIVEWAY PER DS-7
(21) CONCRETE CHECK DAM PER DETAIL 'Y' ON SHEET 3A
(22) INLET APRON PER R.S.D.R.S.D. D-39 AND MODIFIED AS SHOWN
~~(23) CURB INLET, TYPE A PER S.D.R.S.D. D-1 (L=5')~~
~~(24) STREET LIGHT STANDARD (250 W.P.S.) PER S.D.R.S.D. E-1, E-2~~
~~(25) CUT OFF WALL PER S.D.R.S.D. G-23~~
(26) MID-BLOCK CROSS GUTTER PER S.D.R.S.D. G-13
(27) GRATE INLET SKIMMER BOX AS PROVIDED BY BIO CLEAN ENVIRON. SERVICES (760-433-7640)
(28) TYPE G CATCH BASIN PER S.D.R.S.D. D-8 (SINGLE)
~~(29) CONCRETE LOG PER S.D.R.S.D. D-62~~
(30) BIORETENTION SWALE PER DETAIL 'X' ON SHEET 3A

COUNTY APPROVED CHANGES

NO.	DESCRIPTION:	APPROVED BY:	DATE:
1	NEW SHEET, REPLACED SHEET 2		8/2/2012
2	RECORD PLAN	KSB	11/16/14

RECORD PLAN

BY: [signature] DATE: 10/14/13
NAME 23080
R.C.E.
EXPIRES: 12/31/13

REGISTERED PROFESSIONAL ENGINEER GARY LIPSKA No. 23080 CIVIL STATE OF CALIFORNIA

PERMITS

AEIS NO. 03-08-029
SITE PLAN REVIEW NO. S-03-026
GRADING PLAN L-14940
NOTICE OF INTENT 9 37C353626

BENCH MARK

DESCRIPTION: MONUMENT NO. 1031 PER R.O.S 14689
2" IRON PIPE W/BRASS DISC MARKED "GPS KE31"
LOCATION: COLE GRADE ROAD, 68' W'LY OF VALLEY CENTER ROAD INTERSECTION
RECORD FROM: NGVD 29
ELEVATION: 1349.30 DATUM: M.S.L.

PRIVATE CONTRACT

SHEET 2A | COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS | 13 SHEETS

IMPROVEMENT PLAN FOR:
LIZARD ROCKS ROAD
PARCEL 3, PARCEL MAP NO. 7078
CALIFORNIA COORDINATE INDEX 386-1761

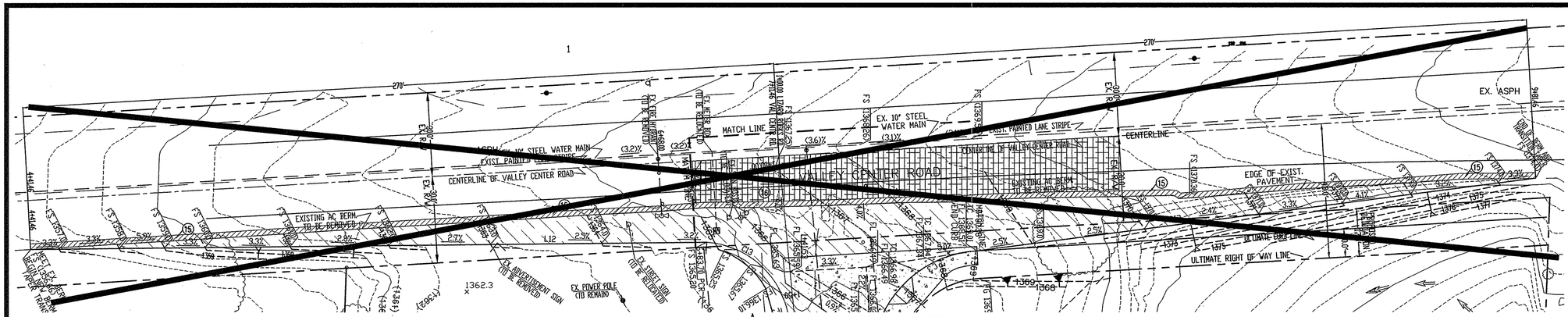
APPROVED FOR: MOHAMAD FAKHRIDDINE, COUNTY ENGINEER
BY: [signature] DATE: 1-16-14
ENGINEER OF WORK: [signature] DATE: 7/31/12
GARY LIPSKA, R.C.E. 23080, EXPIRES 12/31/13
CHECKED BY:
APPROVAL DATE:
IMPROVEMENT PLAN NO. CG 4646

Accuterra Engineering Inc.
CIVIL ENGINEERING • LAND PLANNING
1843 Campesino Place
Oceanside, CA 92054
Tele: (760) 439-2802
Fax: (760) 439-2886

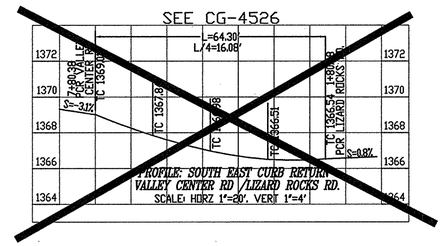
ENGINEER: AQUATERRA ENGINEERING INC.
TELEPHONE: 760-439-2802

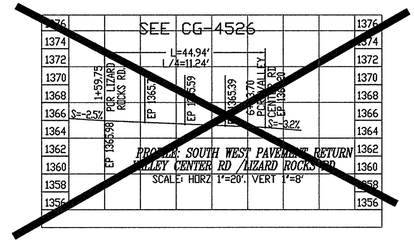
NEW SHEET

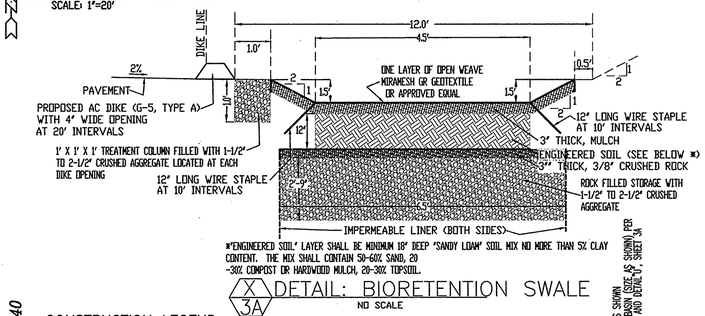
PLOT DATE: 7/25/12



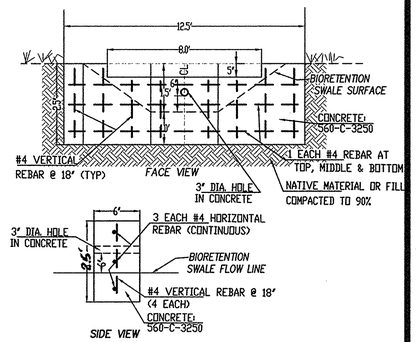
VALLEY CENTER ROAD PLAN
SCALE: 1"=20'



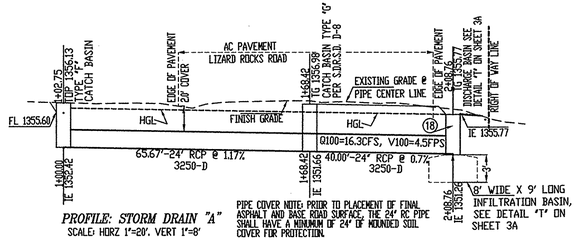




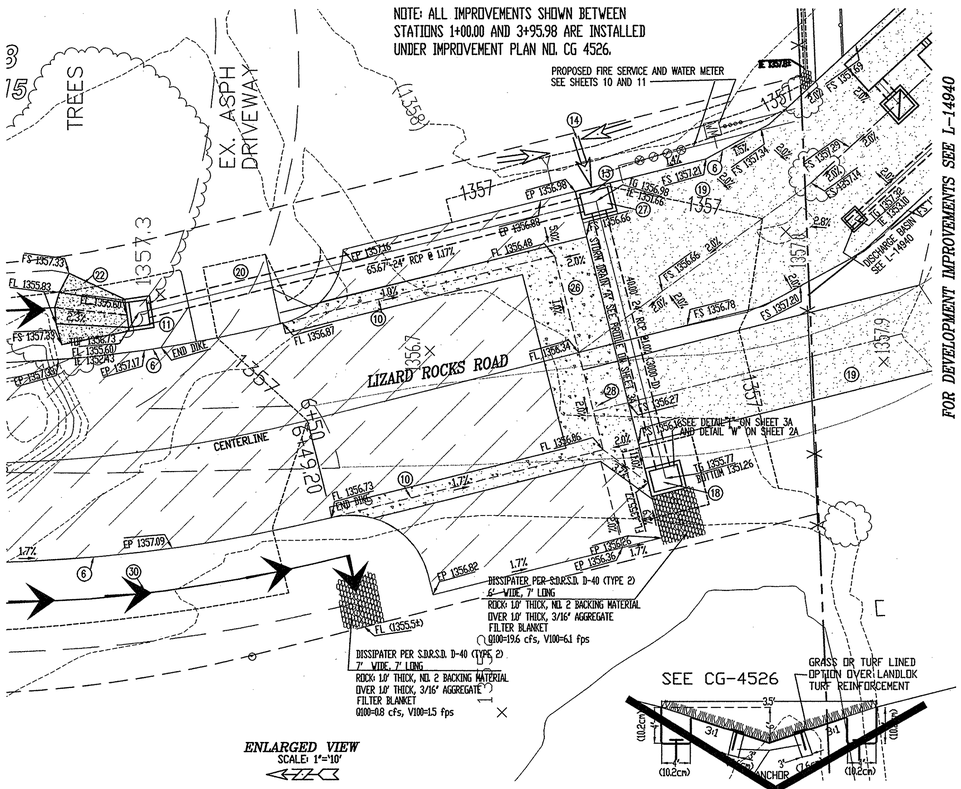
X 3A DETAIL: BIORETENTION SWALE
NO SCALE



Y 3A DETAIL: CONCRETE CHECK DAM
NO SCALE



NOTE: ALL IMPROVEMENTS SHOWN BETWEEN STATIONS 1+00.00 AND 3+95.98 ARE INSTALLED UNDER IMPROVEMENT PLAN NO. CG 4526.



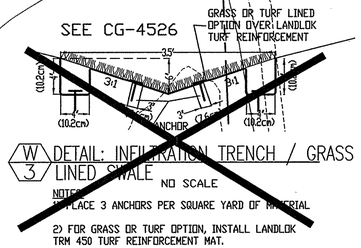
Scale: 1" = 20'

CIVIL ENGINEERING • LAND PLANNING
Aquaterra Engineering Inc.
1843 Campesino Place
Oceanside, CA 92054
Tele: (760) 439-2802
Fax: (760) 439-2866

FOR DEVELOPMENT IMPROVEMENTS SEE L-14940

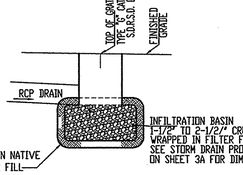
CONSTRUCTION LEGEND

3. ASPHALT PAVEMENT AS APPROVED BY MATERIALS LABORATORY.
4. ~~CONCRETE CURB AND GUTTER PER S.D.R.S.D. G-2 (TYPE C)~~
5. ~~CONCRETE SIDEWALK PER S.D.R.S.D. G-7, G-9, G-10~~
6. DIKE-ASPHALT CONCRETE PER S.D.R.S.D. G-5 (TYPE A)
7. ~~PEDESTRIAN RAMP PER S.D.R.S.D. G-27 (TYPE A)~~
8. ~~CONCRETE DRIVEWAY PER S.D.G.S.D. G-14A~~
9. CROSS GUTTER PER S.D.R.S.D. G-12
10. CONCRETE RIBBON GUTTER PER DETAIL "S" ON SHEET 3A
11. CATCH BASIN TYPE F PER S.D.R.S.D. D-7
12. ~~CURB OUTLET (TYPE A) PER S.D.R.S.D. D-25~~
13. TYPE G CATCH BASIN PER S.D.R.S.D. D-8 (DOUBLE)
14. BROW DITCH PER S.D.R.S.D. D-75 (TYPE D)
15. ~~REMOVE TOP 0.1' (MIN) OF EX. ASPHALT AND INSTALL AC OVERLAY FOR SMOOTH TRANSITION~~
16. ~~AC OVERLAY FOR SMOOTH TRANSITION (0.1' MINIMUM) GRIND AS REQUIRED~~
17. PROPOSED FIRE HYDRANT SEE SHEET 8
18. CATCH BASIN TYPE G (DOUBLE) PER S.D.R.S.D. D-8 MODIFIED PER DETAIL "T" ON SHEET 3A AND DETAIL "W" ON SHEET 3A
19. DRIVEWAY PAVEMENT (PRIVATE)
20. ASPHALT CONCRETE DRIVEWAY PER DS-7
21. CONCRETE CHECK DAM PER DETAIL "Y" ON SHEET 3A
22. INLET APRON PER R.S.D.R.S.D. D-39 AND MODIFIED AS SHOWN
23. ~~CURB INLET, TYPE A PER S.D.R.S.D. D- 1 (L=5')~~
24. ~~CUT OFF WALL PER S.D.R.S.D. G-23~~
26. MID-BLOCK CROSS GUTTER PER S.D.R.S.D. G-13
27. GRATE INLET SKIMMER BOX AS PROVIDED BY BIO CLEAN ENVIRON. SERVICES (760-433-7640)
28. TYPE G CATCH BASIN PER S.D.R.S.D. D-8 (SINGLE)
29. ~~CONCRETE LUG PER S.D.R.S.D. D-63~~
30. BIORETENTION SWALE PER DETAIL "X" ON SHEET 3A

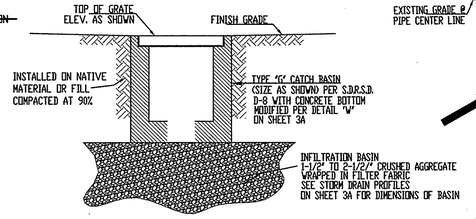


W 3 DETAIL: INFILTRATION TRENCH / GRASS LINED SWALE
NO SCALE

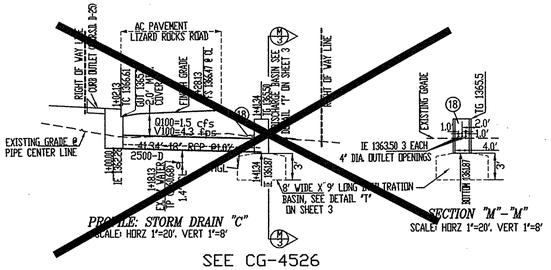
NOTES:
1) PLACE 3 ANCHORS PER SQUARE YARD OF MATERIAL
2) FOR GRASS OR TURF OPTION, INSTALL LANDLOK TRM 450 TURF REINFORCEMENT MAT.



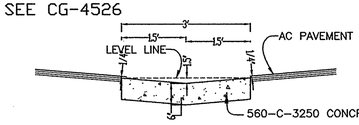
T 3A DISCHARGE BASIN
NO SCALE



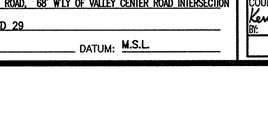
U 3A DETAIL: CATCH BASIN
NO SCALE



SEE CG-4526



S 3A CONCRETE RIBBON GUTTER
NO SCALE



W 3A PLAN VIEW: BOTTOM OF MODIFIED TYPE "G" CATCH BASIN
NO SCALE

REGISTERED PROFESSIONAL ENGINEER GARY LIPSKA No. 23080 CIVIL STATE OF CALIFORNIA

RECORD PLAN	
BY:	DATE: 10/14/13
NAME	
R.C.E.	23080
EXPIRES:	12/31/13

COUNTY APPROVED CHANGES			
NO.	DESCRIPTION:	APPROVED BY:	DATE:
1	NEW SHEET (Delete work completed under CG 4526)	~~n/a~~ KBB	~~8/2/2012~~ 11/16/14
2	RECORD PLAN	KBB	11/16/14

PERMITS	
AEIS NO.	03-08-029
SITE PLAN REVIEW NO.	S-03-026
GRADING PLAN	L-14940
NOTICE OF INTENT	9 37C353626

BENCH MARK
DESCRIPTION: MONUMENT NO. 1031 PER R.O.S 14689
2" IRON PIPE W/BRASS DISC MARKED "GPS KE31"
LOCATION: COLE GRADE ROAD, 68' W'LY OF VALLEY CENTER ROAD INTERSECTION
RECORD FROM: NGVD 29
ELEVATION: 1349.30 DATUM: M.S.L.

PRIVATE CONTRACT

SHEET 3A	COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS	13 SHEETS

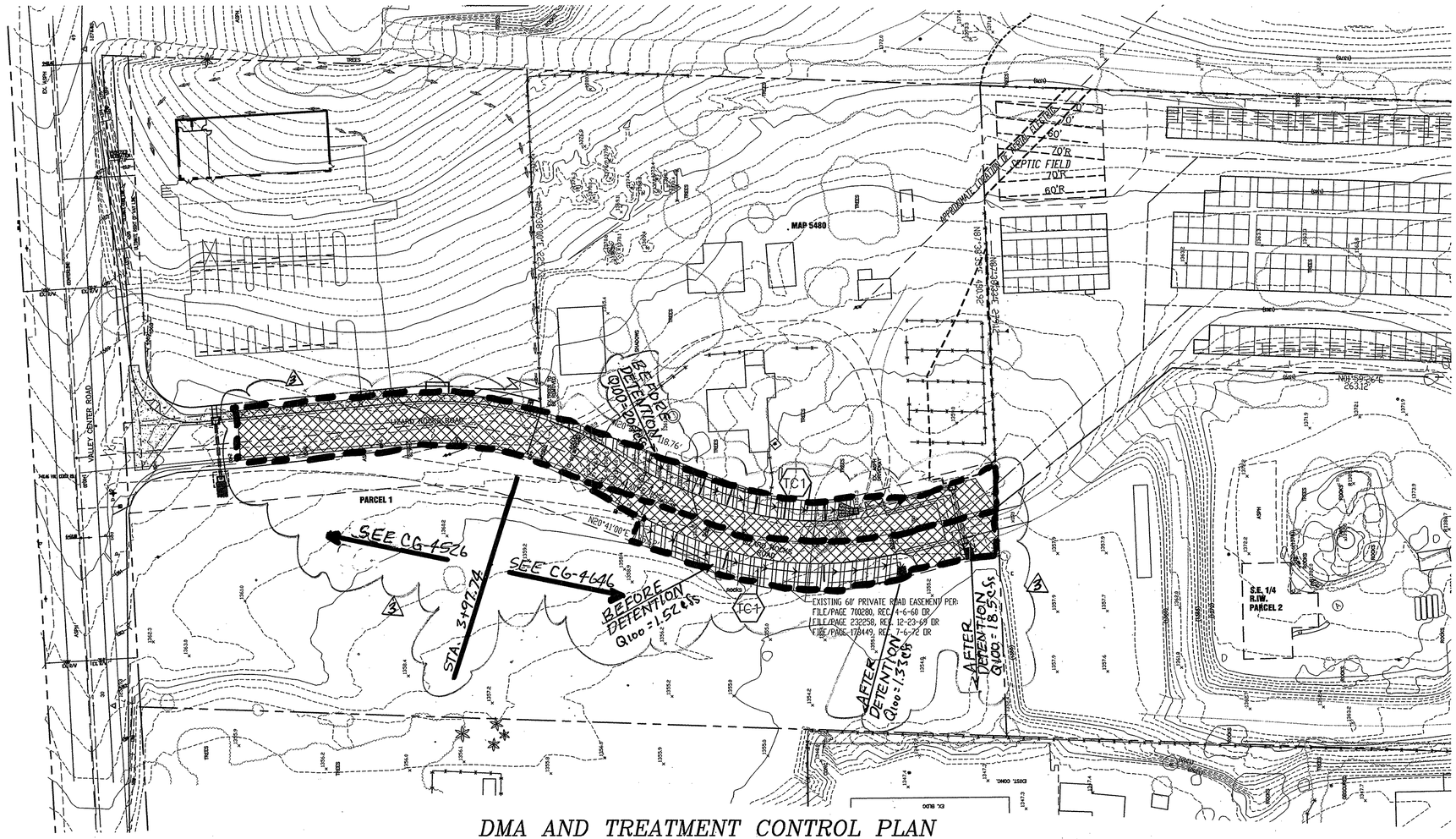
IMPROVEMENT PLAN FOR:
LIZARD ROCKS ROAD
PARCEL 3, PARCEL MAP NO. 7078
CALIFORNIA COORDINATE INDEX 386-1761

APPROVED FOR: MOHAMAD FAKHRIDDINE COUNTY ENGINEER	ENGINEER OF WORK
BY: Kenneth G. Brazell DATE: 1-16-14	DATE: 7/25/12
CHECKED BY:	IMPROVEMENT PLAN NO. CG 4646
APPROVAL DATE:	

NEW SHEET

PLOT DATE: 7/25/12

ENGINEER: AQUATERRA ENGINEERING INC.
TELEPHONE: 760-439-2802



DMA AND TREATMENT CONTROL PLAN

SCALE: 1"= 40'

SURFACE LEGEND

PAVEMENT

UNPAVED SHOULDER

* IDENTIFICATION NUMBER PER 'BMP SIZING CALCULATOR'

IMP TABLE BASIN Q1

DMA NAME	DMA AREA (S.F.)	SURFACE TYPE	DMA RUNOFF FACTOR	DMA AREA X FACTOR (S.F.)	IMP TYPE: BIORETENTION SWALE	IMP NAME: TC1
Q1A (18936)*	11761	PAVEMENT	1.0	11761		
Q1B (18937)*	1742	SHOULDER	0.1	174		
					IMP SIZING	MINIMUM AREA (S.F.)	ACTUAL AREA (S.F.)
		TOTAL	11935		0.04	477	571

* IDENTIFICATION NUMBER PER 'BMP SIZING CALCULATOR'

IMP TABLE BASIN Q2

DMA NAME	DMA AREA (S.F.)	SURFACE TYPE	DMA RUNOFF FACTOR	DMA AREA X FACTOR (S.F.)	IMP TYPE: BIORETENTION SWALE	IMP NAME: TC1
Q2A (18929)*	7841	PAVEMENT	1.0	7841		
Q2 (18930)*	2178	SHOULDER	0.1	218		
					IMP SIZING	MINIMUM AREA (S.F.)	ACTUAL AREA (S.F.)
		TOTAL	8059		0.04	322	783

* IDENTIFICATION NUMBER PER 'BMP SIZING CALCULATOR'

(SWMP NOTES)

TREATMENT CONTROL BMPS

TC1 – BIORETENTION SWALE PER DETAIL "X" ON THIS SHEET. (BMP-1)

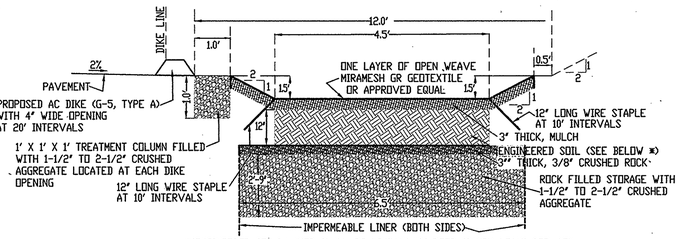
* IDENTIFICATION NUMBER PER 'BMP SIZING CALCULATOR'

SYMBOL LEGEND

DESCRIPTION	SYMBOL
ELEVATION, TOP OF FOOTING	TF
ELEVATION, TOP OF WALL	TW
ELEVATION, TOP OF CURB	TC
ELEVATION, FINISH SURFACE	FS
ELEVATION, FINISH GRADE	FG
ELEVATION, TOP OF GRATE	TG
ELEVATION, BOTTOM OF FOOTING	BF
ELEVATION, FLOW LINE	FL
ELEVATION, INVERT ELEVATION	IE
ELEVATION LABEL, EXISTING	(596.00)
ELEVATION LABEL, PROPOSED	596.00

DETAIL REFERENCE: C/2 — DETAIL LABEL / SHEET NO.

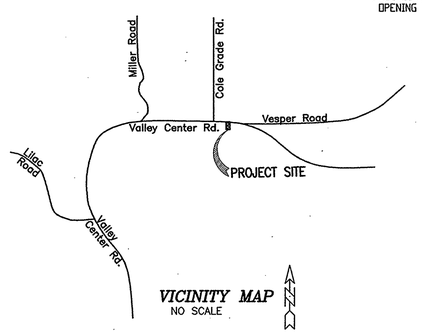
CIVIL ENGINEERING * LAND PLANNING
Terra Engineering Inc.
1843 Campesino Place
Oceanside, CA 92054
Tele: (760) 439-2802
Fax: (760) 439-2866



*'ENGINEERED SOIL' LAYER SHALL BE MINIMUM 18" DEEP 'SANDY LOAM' SOIL MIX NO MORE THAN 5% CLAY CONTENT. THE MIX SHALL CONTAIN 50-60% SAND, 20-30% COMPOST OR HARDWOOD MULCH, 20-30% TOPSOIL.

X DETAIL: BIORETENTION SWALE

NO SCALE



VICINITY MAP

NO SCALE

RECORD PLAN

BY: [signature] DATE: 10/14/13

R.C.E. 23080

EXPIRES: 12/31/13

COUNTY APPROVED CHANGES

NO.	DESCRIPTION:	APPROVED BY:	DATE:
1	NEW SHEET	[signature]	8/2/2013
3	ADD DRAINAGE BASIN DATA, RECORD PLAN	KJB	1/16/14

PERMITS

AEIS NO. 03-08-029

SITE PLAN REVIEW NO. S-03-026

GRADING PLAN L-14940

NOTICE OF INTENT 9 37C353626

BENCH MARK

DESCRIPTION: MONUMENT NO. 1031 PER R.O.S 14689
2" IRON PIPE W/BRASS DISC MARKED "GPS KE31"

LOCATION: COLE GRADE ROAD, 68' W'LY OF VALLEY CENTER ROAD INTERSECTION

RECORD FROM: NGVD 29

ELEVATION: 1349.30 DATUM: M.S.L.

PRIVATE CONTRACT

SHEET 9 | COUNTY OF SAN DIEGO DEPARTMENT OF PUBLIC WORKS | 13 SHEETS

DMA AND TREATMENT CONTROL PLAN FOR:
LIZARD ROCKS ROAD
PARCEL 3, PARCEL MAP NO. 7078

CALIFORNIA COORDINATE INDEX 386-1761

APPROVED FOR: MOHAMAD FAKHRIDDINE COUNTY ENGINEER

BY: [signature]

ENGINEER OF WORK: [signature] DATE 7/25/12
GARY LIPSKA RCE 23080 EXPIRES 12/31/13

CHECKED BY:

APPROVAL DATE:

IMPROVEMENT PLAN NO. CG 4646

REGISTERED PROFESSIONAL ENGINEER GARY LIPSKA No. 23080 CIVIL STATE OF CALIFORNIA

NEW SHEET

plot date: 7-25-12