Michael Baker
INTERNATIONAL

PRELIMINARY
HYDROLOGY REPORT

FOR
SARES-REGIS INDUSTRIAL DEVELOPMENT
(SARES-REGIS GROUP)

COUNTY OF RIVERSIDE
CALIFORNIA

July, 2019
Prepared by: Rick Howe
JN 152480

Table of Contents

SECTION 1 - SUMMARY

INTRODUCTION

The purpose of this report is to provide hydrologic analysis for Sares-Regis Group's development of 47.1 acres in the Perris Valley area into a two-building industrial "Site". The Site is bounded by Nandina Avenue to the north, Oleander Avenue to the south, and Decker Road to the east, and grading limits approximately 1800' east of Day Street to the east in a portion of unincorporated Riverside County. The Site is in the center of the larger 136.7 acre hydrologic boundary this report will study. The hydrologic boundaries extend westerly to Day St and 1000' further easterly of Decker Rd. This drainage study is intended to provide:

- Schematically map out the major storm drain infrastructure for the project area
- The County of Riverside has informed us that the storm drain system this site is tributary to is sized to convey 100-year ultimate buildout runoff from the area, but that further down-stream Caltrans has constructed storm drain infrastructure designed to convey only the 10-year runoff rates. Calculations of the 10-year and 100-year existing and proposed runoff rates will be provided. Per County of Riverside comments until Caltrans up-sizes their infrastructure (which we were told is planned for in the future) peak runoff rates for these storm events shall not increase due to development of the site.
- Calculations of the 10-year existing and proposed volume of storm runoff. The County of Riverside has told us that on-site extended detention will be required to prevent an increase in peak runoff rates due to development and the preliminary sizing of detention basins should be equivalent to the difference in runoff volume between the existing and proposed 10-year storm events.
- Show where off-site runoff from natural terrain is intercepted up-stream of the site and released back into natural terrain down-stream of the site
- Show that the Site is adequately protected in the event that all inlets are clogged and where runoff overland relief occurs.
- Show hydraulically that the immediate down-stream infrastructure is sufficiently sized to accept 100-year storm event runoff rates.

EXISTING CONDITIONS
(INFRASTRUCTURE, PEAK RUNOFF RATES, AND TOTAL VOLUME OF STORM RUNOFF)

The project site is currently vacant land with seasonal weeds and rock outcroppings. The project site is located within the San Jacinto River watershed. The site has a natural fall from west to east with three well defined watersheds for analysis. There are no identified USGS “blue lines” crossing the site. The local high point from which off-site flows originate is nearby, approximately 2000’ to the west of the site.

Currently the three watersheds are broken up and named based on the storm drain lateral that the watershed is tributary to as follows (see also Preliminary Hydrology Map):

- Watershed B-9AA is 34.7 acres north-west of the intersection of Decker Rd and Harley Knox Blvd. Historically runoff from Watershed B-9AA flowed easterly and per Master Drainage Plan for Perris Valley Area June 1991 was intended to be tributary to storm drain Lateral B-9. Now upon construction of 30” RCP storm drain Lateral B-9AA per Riverside County File No. 964B runoff is picked up in a Decker Rd adjacent 48” riser tributary to storm drain Lateral B-9AA and ultimately Lateral B-9. The existing runoff rates are: Q10=33.67 CFS and Q100=53.35 CFS. Additionally, runoff from Lateral B-9AA2 located on the east side of Decker Rd (Not-A-Part) near Nandina Ave constructed per Riverside County File No. 964B adds 1.90 CFS to the Q100 totaling Q100=55.25 CFS.
  Hydrograph analysis of the 10-year/24-hour storm event shows that the total storm volume is 4.03 acre-feet of runoff.

  Note: Included in the 34.7 acres is 5.6 acres (Sub-areas T and U) of partially offsite area to the north-west of the Site. Historically runoff from this area flowed north of Nandina Ave at the now Decker Rd intersection. Upon construction of Nandina Ave and Decker Rd circa 2017 an 18” culvert was installed per Riverside County As-Built File No. 964B directing runoff north of Nandina Ave to be picked up easterly in 36” RCP storm drain Lateral B-9A (see reference plan in appendix). To be able to compare existing flow rates to proposed flow rates from equal areas it has assumed that the runoff from Sub-areas T and U joins other on-site runoff at the Decker Rd-Nandina Ave intersection. The amount of culvert runoff crossing Nandina Ave is: Q10=6.24 CFS and Q100=9.59 CFS.

  Watershed B-8 is 71.0 acres beginning near the intersection of existing Day St and future Oleander Ave and ends at the future Decker Rd and is tributary to existing 48” RCP storm drain Lateral B-8. Historically runoff from Watershed B-8 flowed easterly and per Master Drainage Plan for Perris Valley Area June 1991 was intended to be tributary to storm drain Lateral B-8. Now upon construction of Harley Knox Blvd to Decker Rd and construction of the extension of Lateral B-8 per Riverside County Drawing No. 4-1060 it is (see appendix for reference plan). The existing runoff rates are: Q10=63.66 CFS and Q100=98.73 CFS.

  Hydrograph analysis of the 10-year/24-hour storm event shows that the total storm volume is 8.25 acre-feet of runoff.

- Watershed B-8A is 31.9 acres zoned for future industrial facility and is tributary to Lateral B-8 as historically intended per Master Drainage Plan for Perris Valley Area June 1991 by way of existing 48” RCP Lateral B-8A. This watershed is outside the area of the development but is analyzed because the project site is tributary to it and because it must be shown that Lateral B-8 is sufficiently sized. The existing runoff rates are: Q10=27.19 CFS and Q100=42.17 CFS.

Note that the runoff rate in the existing Nandina Ave 30” RCP storm drain Lateral B-9AA per the Riverside County File No. 964B plan is by our calculations under-reported at Q100=42.3 CFS; our calculations suggest the actual flow rate is Q100=44.52 CFS.

Note that the runoff rate in the existing 48” RCP storm drain Lateral B-8 per Riverside County Drawing No. 4-1060 is by our calculations over-stated at Q100=182.0 CFS; our calculations suggest the actual flow rate is Q100=140.90 CFS

Summation of Existing Condition Hydrology for the 105.7 acre hydrologic boundary (Watersheds B-9AA and B-8):
10-year runoff volume=12.28 acre-feet
Q10=27.19 CFS
Q100=42.17 CFS.

PROPOSED CONDITIONS
(INFRASTRUCTURE, PEAK RUNOFF RATES, AND TOTAL VOLUME OF STORM RUNOFF

The proposed storm drain system will be made of HDPE or RCP pipe. Off-site flows will not be mixed with on-site flows prior to on-site flows being treated for water quality (see Proposed Condition Hydrology Map). Storm drain pipes will convey runoff to the existing down-stream storm drain systems. Proposed drainage patterns have the intent to respect the tributary drainage areas depicted on the Master Drainage Plan for Perris Valley Area June 1991. Proposed storm drain infrastructure and routing will ensure runoff rates are within the criteria imposed by the County of Riverside.

Street-side catch basins:

The two catch basins proposed on Harley Knox Blvd and the two catch basins on Decker Road southerly of Harley Knox Blvd will convey runoff to Lateral B-8 in Harley Knox Blvd. The three catch basins proposed near the intersection of Nandina Ave and Decker Rd will convey runoff to Lateral B-9AA in Nandina Ave.

Runoff from undeveloped areas tributary to the site:

The 2.8 acre Sub-area HH up-stream and north-west of the Site will be intercepted at an inlet structure near Nandina Ave and conveyed by storm drain pipe in Nandina Ave to Lateral B-9AA.

Runoff from the up-stream 56.2 acres of undeveloped (Portion of Watershed B-8) barren natural land up-stream of the Site will be intercepted by brow-ditches at the western edge grading limit. The runoff will be reintroduced into the existing 48” RCP storm drain Lateral B-8 at the intersection of Harley Knox Blvd.

Most runoff from the undeveloped areas is conveyed within obvious earthen gulleys as concentrated flow. Inlet structures are positioned where concentrated runoff flow occurs. Where runoff from undeveloped areas is conveyed by sheet-flow brow-ditches are proposed to capture runoff. Brow-ditches along the westerly grading limit shall not convey more than 10 CFS of runoff. Hydrologic calculations have shown that the maximum flow-rate expected in any brow-ditch is Q100=3.9 CFS (see Sub-area D on the Proposed Hydrology Map). An access road for maintenance of the drainage inlets and brow-ditches runs the entire westerly edge of the site.

Runoff from undeveloped areas west of the Site flowing northerly across Nandina Ave:

With the extension of Nandina Ave northerly to future Day St runoff is disrupted. Culverts will be constructed under the proposed Nandina Ave roadway to intercept runoff at points of concentration on the southerly side and convey that runoff to the northerly side of Nandina Ave to maintain existing drainage patterns.

2:1 slope at the westerly edge of the Site:

A 2:1 slope is to be cut in the existing bedrock. Geotechnical investigation suggests that the slope will be solid rock. The slope will be treated as Commercial/Industrial cover type for hydologic calculations. Though shown to have terrace drainage, in final engineering it is not expected to exist, because erosion is not expected to occur on the solid rock face. At the bottom of the slope there will be a v-ditch intercepting all runoff that will be conveyed to the on-site storm drain system.

Watershed B-9AA:

Runoff from the 21.3 acre Watershed B-9AA is conveyed to the 30” RCP Lateral B-9AA at the intersection of Nandina Ave and Decker Rd. The proposed runoff rates to that location are Q10=31.35 CFS and Q100=45.25 CFS. Hydrograph analysis of the 10-year/24-hour storm event shows that the total storm volume is 2.63 acre-feet of runoff. Analysis of peak runoff rate and storm volume shows a reduction in both, peak runoff rate and volume, as compared to the existing condition. Underground detention to mitigate for increased flow is not expected to be necessary, but in the event that in final engineering analysis determines differently it will be provided. The proposed hydrology map shows a place holder for underground retention if necessary.

Comparison of existing vs proposed runoff for Watershed B-9AA:
Existing 10-year runoff volume=4.03 acre-feet, Q10=33.67 CFS, Q100=53.35 CFS
Proposed 10-year runoff volume=2.63 acre-feet, Q10=31.35 CFS, Q100=45.25 CFS

Watershed B-8:

Runoff from the 84.8 acre Watershed B-8 is conveyed to the 48” RCP Lateral B-8 that currently terminates easterly of Decker Rd in Harley Knox Blvd. The proposed runoff rates to that location are Q10=90.53 CFS and Q100=135.68 CFS. Hydrograph analysis of the 10-year/24-hour storm event shows that the total storm volume is 10.30 acre-feet of runoff. Analysis of peak runoff rate and storm volume shows an increase in both, peak runoff rate and volume, as compared to the existing condition. Underground detention to mitigate for increased flow will be required. Preliminary sizing of underground detention is based on the difference between the existing 10-year runoff volume and the proposed runoff volume. The proposed hydrology map shows a place holder for preliminarily sized underground retention.

Comparison of existing vs proposed runoff for Watershed B-8:
Existing 10-year runoff volume=8.25 acre-feet, Q10=63.66 CFS, Q100=98.73 CFS
Proposed 10-year runoff volume=10.30 acre-feet, Q10=90.53 CFS, Q100=135.68 CFS

The increased flow rates will be mitigated down to exiting condition flow rates by utilizing underground detention. The required volume of detention to reduce flow rates is equal to the increase in 10-year runoff volume=2.05 acre-feet=89,300 CF. Three locations on-site have been designated for underground storage: 17,000 CF at the south-east corner of the northern building, 47,000 CF at the north-east corner of the southern building, and 26,000 CF at the south-east corner of the southern building; 90,000 CF total.

Through routing of on-site runoff though underground storage the peak runoff rates for Watershed B-8 will be that of the existing condition Q10=63.66 CFS, Q100=98.73 CFS.

Watershed B-8A:

The 31.9 acre undeveloped parcel south-easterly of the Site and east of Decker Rd makes up Watershed B-8A. Flow rates attributed to this watershed are addressed in the existing condition section of this report. Off-site runoff from 71.0 acres of natural terrain will no longer be tributary to Watershed B-8A. The existing infrastructure on that parcel was designed to convey all of its runoff and the runoff from the 71.0 off-site acres. The existing infrastructure is assumed to be sufficiently sized to convey the lower proposed runoff flow rates.

Comparison of existing vs proposed runoff to the existing Watershed B-8A infrastructure:
Existing Q10=90.85 CFS, Q100=140.90 CFS
Proposed Q10=27.19 CFS, Q100=42.17 CFS

Lateral B-8 Runoff Rates:

The total flow tributary to Lateral B-8 is the summation of runoff from Watersheds B-8 (Q10=63.66 CFS, Q100=98.73 CFS) and B-8A (Q10=27.19 CFS, Q100=42.17 CFS) = Q10=90.85 CFS, Q100=140.90 CFS.

HYDRAULICS

Lateral B-9AA, 30” RCP, constructed per Riverside County File No. 964B was designed with a stated Q100=42.3 CFS. The existing plan does not state whether this is its capacity, but appears oversized based on HGL, so normal depth calculations have been performed. The existing and proposed flow rates were used in the analysis. Normal depth calculations show that in the existing condition with Q100=55.25 CFS the 2.50’ pipe runs at 2.36’ deep when using the minimum pipe slope of 1.5%. Normal depth calculations show that in the proposed condition with Q100=47.15 CFS the 2.50’ pipe runs at 1.92’ deep when using the minimum pipe slope of 1.5%. The pipe is sufficiently sized to convey the proposed runoff.

Lateral B-8, 48” RCP, constructed per Riverside County Drawing No. 4-1060 was designed to convey Q100=182.0 CFS (see reference plans in appendix). The proposed runoff rate to Lateral B-8 is Q100=140.90 CFS. This is a reduction to 77% of its approved conveyance rate and is therefore considered sufficiently sized.

OVERLAND PROTECTION

Infrastructure and private properties are protected in the event that all catch basin inlets are clogged. An “Overland Relief Map” showing the runoff flow-path in such an event is included in the appendix.

WATER QUALITY

The water treatment and runoff mitigation are not a part of this report; they are outlined in the Preliminary WQMP for this project. For reference though, the Treatment Control BMP for this project is volume-based under-ground retention followed by bio-filtration utilizing Modular Wetlands System.

The routing of runoff through underground retention basins is described below:

- There are 4 areas on-site in which runoff is collected and routed through underground retention basins. The areas are in the same location as the underground storm storage shown on the proposed hydrology map.
- Diversion structures route all first flush/low flow runoff into underground retention basins to capture the required volume of runoff.
- Runoff beyond the required capture volume by-passes the water quality basins and must enter the proposed underground storm detention storage basins as shown on the proposed hydrology map before leaving the site.
- Runoff that enters the water quality basins is metered out into Modular Wetlands System bio-filtration devices.
- The now cleaned runoff is reintroduced to the main storm drain system up-stream of the storm detention basins to be metered out for hydro-modification reasons.

METHODOLOGY

The Rational Method was used to calculate 100-year and 10-year peak storm runoff rates. The Advanced Engineering System (AES) computer program approved for the County of Riverside was utilized for the calculations. Input values/criteria came from the Riverside County Flood Control Hydrology Manual. Rainfall intensity values were obtained from Intensity-Duration Table plate D4.1 located in the Riverside County Flood Control Hydrology Manual for the Perris Valley Area (see appendix). This site is comprised primarily of type BC soils so Type C Soils was used for analysis (see Hydrologic Soils Group Map for Steele Peak Plate C-1.29 in the appendix).

Unit Hydrographs were developed to calculate the total volume of runoff for the 10-year/24 hour storm event. These calculations will be performed in the existing and proposed condition. The difference in total storm runoff volume between existing and proposed condition is a good approximation of the volume of runoff that will be required to be retained on-site to mitigate for an increase in runoff rates due to development.

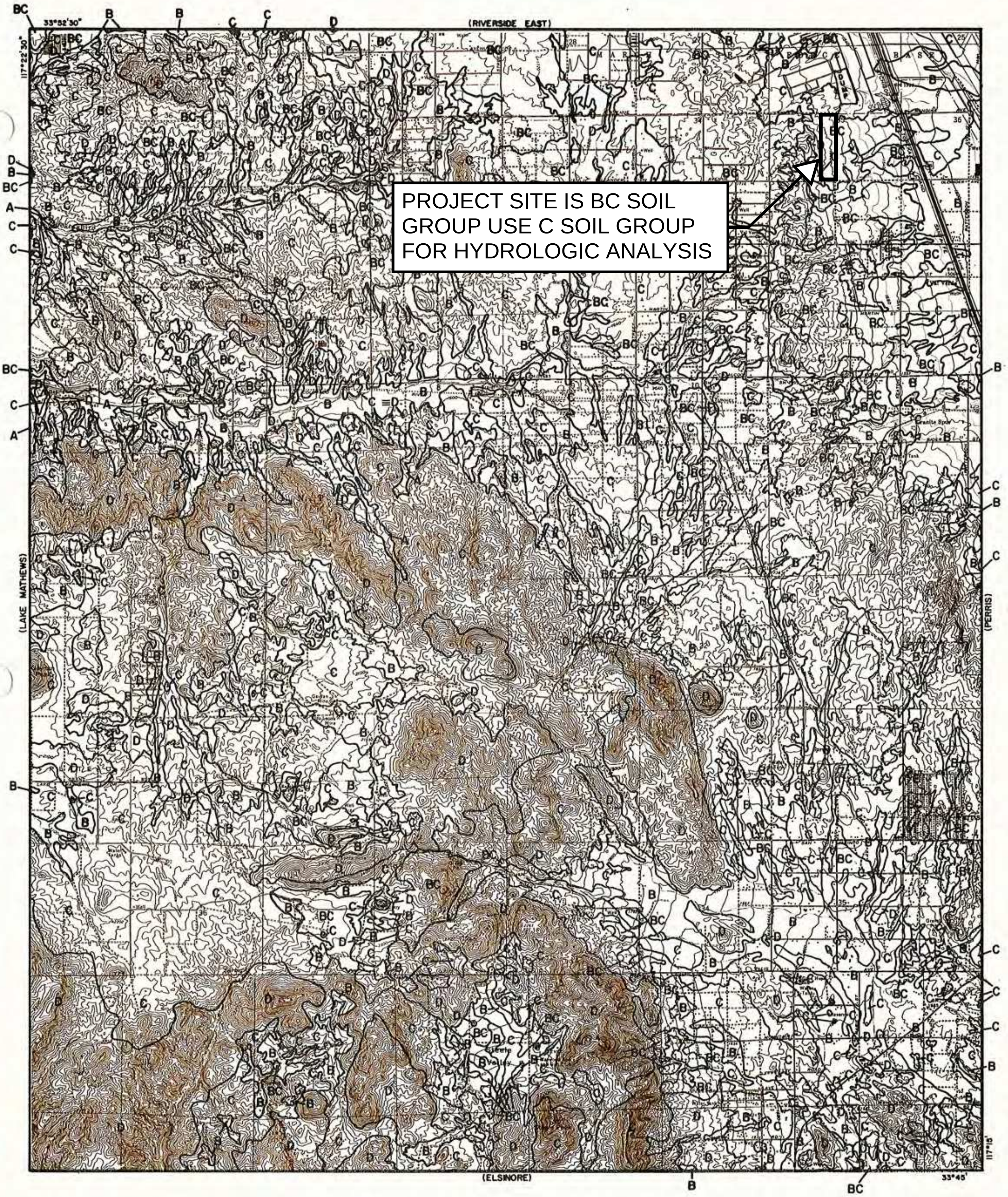
Hydrographs were developed utilizing the Advanced Engineering System (AES) computer program approved for the County of Riverside. Input values/criteria came from the Riverside County Flood Control Hydrology Manual. Precipitation values for the 2-year and 100-year storms came from Isohyetal Maps (Plates E-5.5 and E-5.6 respectively). The 10-year precipitation was derived from the 2-year and 100-year values plotted on Plate E-5.7. Loss rates were determined by Plates E-6.1, E-6.2, and E2.1.

CONCLUSION

This report and associated calculations are based on preliminary engineering. Final engineering of the site will be completed and will incorporate a finalized hydrologic and hydraulic analysis, to be submitted in the future for final approval. Based on the findings in this report, it is concluded that the proposed development can be adequately protected according to the District's requirements in conjunction with the ultimate development and maintenance of the proposed facilities.

This drainage study provided:

- A schematic map of the major storm drain infrastructure for the project area (see the Existing and Proposed Hydrology Maps in the appendix.
- Calculations of the 10-year and 100 year existing and proposed runoff rates reflect an increase in runoff rates that will be mitigated by routing runoff through underground detention facilities sized per the County of Riverside criteria.
- Calculations of the 10-year runoff volume were used to determine preliminary sizing of underground detention facilities to reduce peak runoff rates down to existing condition.
- The plan shows where off-site runoff from natural terrain (westerly portion of the proposed Nandina Ave roadway) is intercepted up-stream of the site and released back into the natural terrain down-stream of the site where it previously flowed.
- Runoff rates are reduced or limited to the existing runoff rates to the tributary storm drain system. Hydraulic calculations show that the existing down-stream storm drain system is sufficiently sized to convey proposed runoff.
- In the unlikely event that every inlet is 100% clogged the Site is protected by overland relief.



LEGEND

—— SOILS GROUP BOUNDARY

A SOILS GROUP DESIGNATION

RCFC & WCD

HYDROLOGY MANUAL

0 FEET 5000

HYDROLOGIC SOILS GROUP MAP FOR STEELE PEAK

PLATE C-1.29

RAINFALL INTENSITY–INCHES PER HOUR

MIRA LOMA Duration Minutes	MIRA LOMA Frequency 10 Year	MIRA LOMA Frequency 100 Year	MURRIETA - TEMECULA & RANCHO CALIFORNIA Duration Minutes	MURRIETA Frequency 10 Year	MURRIETA Frequency 100 Year	NORCO Duration Minutes	NORCO Frequency 10 Year	NORCO Frequency 100 Year	PALM SPRINGS Duration Minutes	PALM SPRINGS Frequency 10 Year	PALM SPRINGS Frequency 100 Year	PERRIS VALLEY Duration Minutes	PERRIS VALLEY Frequency 10 Year	PERRIS VALLEY Frequency 100 Year
5	2.84	4.48	5	3.45	5.10	5	2.77	4.16	5	4.23	6.76	5	2.64	3.78
6	2.58	4.07	6	3.12	4.61	6	2.53	3.79	6	3.80	6.08	6	2.41	3.46
7	2.37	3.75	7	2.87	4.24	7	2.34	3.51	7	3.48	5.56	7	2.24	3.21
8	2.21	3.49	8	2.67	3.94	8	2.19	3.29	8	3.22	5.15	8	2.09	3.01
9	2.08	3.28	9	2.50	3.69	9	2.07	3.10	9	3.01	4.81	9	1.98	2.84
10	1.96	3.10	10	2.36	3.48	10	1.96	2.94	10	2.83	4.52	10	1.88	2.69
11	1.87	2.95	11	2.24	3.30	11	1.87	2.80	11	2.67	4.28	11	1.79	2.57
12	1.78	2.82	12	2.13	3.15	12	1.79	2.68	12	2.54	4.07	12	1.72	2.46
13	1.71	2.70	13	2.04	3.01	13	1.72	2.58	13	2.43	3.88	13	1.65	2.37
14	1.64	2.60	14	1.96	2.89	14	1.66	2.48	14	2.33	3.72	14	1.59	2.29
15	1.58	2.50	15	1.89	2.79	15	1.60	2.40	15	2.23	[illegible]	15	1.54	2.21
16	1.53	2.42	16	1.82	2.69	16	1.55	2.32	16	2.15	[illegible]	16	1.49	2.14
17	1.48	2.34	17	1.76	2.60	17	1.50	2.25	17	2.08	[illegible]	17	1.45	2.08
18	1.44	2.27	18	1.71	2.52	18	1.46	2.19	18	2.01	[illegible]	18	1.41	2.02
19	1.40	2.21	19	1.66	2.45	19	1.42	2.13	19	1.95	[illegible]	19	1.37	1.97
20	1.36	2.15	20	1.61	2.38	20	1.39	2.08	20	1.89	[illegible]	20	1.34	1.92
22	1.29	2.04	22	1.53	2.26	22	1.32	1.98	22	1.79	[illegible]	22	1.28	1.83
24	1.24	1.95	24	1.46	2.15	24	1.26	1.90	24	1.70	[illegible]	24	1.22	1.75
26	1.18	1.87	26	1.39	2.06	26	1.22	1.82	26	1.62	2.60	26	1.18	1.69
28	1.14	1.80	28	1.34	1.98	28	1.17	1.76	28	1.56	2.49	28	1.13	1.63
30	1.10	1.73	30	1.29	1.90	30	1.13	1.70	30	1.49	2.39	30	1.10	1.57
32	1.06	1.67	32	1.24	1.84	32	1.10	1.64	32	1.44	2.30	32	1.06	1.52
34	1.03	1.62	34	1.20	1.78	34	1.06	1.59	34	1.39	2.22	34	1.03	1.48
36	1.00	1.57	36	1.17	1.72	36	1.03	1.55	36	1.34	2.15	36	1.00	1.44
38	.97	1.53	38	1.13	1.67	38	1.01	1.51	38	1.30	2.09	38	.98	1.40
40	.94	1.49	40	1.10	1.62	40	.98	1.47	40	1.27	2.02	40	.95	1.37
45	.89	1.40	45	1.03	1.52	45	.92	1.39	45	1.18	1.89	45	.90	1.29
50	.84	1.32	50	.97	1.44	50	.88	1.31	50	1.11	1.78	50	.85	1.22
55	.80	1.26	55	.92	1.36	55	.84	1.25	55	1.05	1.68	55	.81	1.17
60	.76	1.20	60	.88	1.30	60	.80	1.20	60	1.00	1.60	60	.78	1.12
65	.73	1.15	65	.84	1.24	65	.77	1.15	65	.95	1.53	65	.75	1.08
70	.70	1.11	70	.81	1.19	70	.74	1.11	70	.91	1.46	70	.72	1.04
75	.68	1.07	75	.78	1.15	75	.72	1.07	75	.88	1.41	75	.70	1.00
80	.65	1.03	80	.75	1.11	80	.69	1.04	80	.85	1.35	80	.68	.97
85	.63	1.00	85	.73	1.07	85	.67	1.01	85	.82	1.31	85	.66	.94
SLOPE = .530			SLOPE = .550			SLOPE = .500			SLOPE = .58			SLOPE = .490		

10-MIN VALUES USED

60-MIN VALUES USED

RCFC & WCD

HYDROLOGY MANUAL

STANDARD INTENSITY–DURATION CURVES DATA

MEAD VALLEY INDUSTRIAL PARK

Sub-Areas - Soil Type and Land Use

Parameters for Loss Rate and Hydrograph Development

Proposed Condition

Watershed Number	Area (acres)	Local Subarea		Soil Type	Land Use	Curve Number (CN) AMC II	I	III
B-8	10.8	A		C	Barren	91	80	98
B-8	9.6	B		C	Barren	91	80	98
B-8	10.3	C		C	Barren	91	80	98
B-8	11.0	D		C	Barren	91	80	98
B-8	1.9	E		C	Barren	91	80	98
B-8	2.3	F		C	Barren	91	80	98
B-8	4.0	G		C	Barren	91	80	98
B-8	2.4	H		C	Barren	91	80	98
B-8	0.4	I		C	Barren	91	80	98
B-8	3.5	J		C	Barren	91	80	98
B-8	1.7	K		C	Commercial, Industrial	69	50	86
B-8	2.0	L		C	Commercial, Industrial	69	50	86
B-8	1.4	M		C	Commercial, Industrial	69	50	86
B-8	1.6	N		C	Commercial, Industrial	69	50	86
B-8	3.2	O		C	Commercial, Industrial	69	50	86
B-8	0.9	P		C	Commercial, Industrial	69	50	86
B-8	1.8	Q		C	Commercial, Industrial	69	50	86
B-8	0.9	R		C	Commercial, Industrial	69	50	86
B-8	3.8	S		C	Commercial, Industrial	69	50	86
B-8	1.1	T		C	Commercial, Industrial	69	50	86
B-8	0.6	U		C	Commercial, Industrial	69	50	86
B-8	2.2	V		C	Commercial, Industrial	69	50	86
B-8	3.7	W		C	Commercial, Industrial	69	50	86
B-8	2.2	X		C	Turf, Good	72	53	89
B-8	1.5	Y		C	Commercial, Industrial	69	50	86
B-8A	31.9	Z		C	Barren	91	80	98
B-9AA	2.0	AA		C	Commercial, Industrial	69	50	86
B-9AA	1.7	BB		C	Turf, Good	72	53	89
B-9AA	1.7	CC		C	Commercial, Industrial	69	50	86
B-9AA	2.9	DD		C	Commercial, Industrial	69	50	86
B-9AA	1.4	EE		C	Commercial, Industrial	69	50	86
B-9AA	2.0	FF		C	Commercial, Industrial	69	50	86
B-9AA	4.2	GG		C	Commercial, Industrial	69	50	86
B-9AA	2.8	HH		C	Barren	91	80	98
B-9AA	1.3	II		C	Commercial, Industrial	69	50	86
B-9AA	0.5	JJ		C	Turf, Good	72	53	89
B-9AA	0.8	KK		C	Commercial, Industrial	69	50	86
Total Area	138.0							

WATERSHED B-8 SUMMATION OF DIFFERENT COVER TYPES

Cover Type No.	Area (acres)	Percent of Pervious (%)	Loss Rate Fp (in/hr)	Soil Type	Land Use	Curve Number (CN) AMC II	I	III
1	56.2	100	0.25	C	Barren	91	80	98
2	26.4	10	0.25	C	Commercial, Industrial	69	50	86
3	2.2	85	0.25	C	Turf, Good	72	53	89
Total	84.8							

WATERSHED B-9AA SUMMATION OF DIFFERENT COVER TYPES

Cover Type No.	Area (acres)	Percent of Pervious (%)	Loss Rate Fp (in/hr)	Soil Type	Land Use	Curve Number (CN) AMC II	I	III
1	2.8	100	0.25	C	Barren	91	80	98
2	16.3	10	0.25	C	Commercial, Industrial	69	50	86
3	2.2	85	0.25	C	Turf, Good	72	53	89
Total	21.3							

WATERSHED B-8A SUMMATION OF DIFFERENT COVER TYPES

Cover Type No.	Area (acres)	Percent of Pervious (%)	Loss Rate Fp (in/hr)	Soil Type	Land Use	Curve Number (CN) AMC II	I	III
1	31.9	10	0.25	C	Barren	91	80	98
Total	31.9							

RCFC & WCD
HYDROLOGY MANUAL

SYNTHETIC UNIT HYDROGRAPH METHOD
Basic Data Calculation Form

Project: WATERSHED B8 EXISTING
By: RICK HOWE Date: 6/18/19
Checked: ____ Date: ____
Sheet:

LOSS RATE DATA

AVERAGE ADJUSTED LOSS RATE

[1] SOIL GROUP (PLATE C-1)	[2] COVER TYPE	[3] RI NUMBER (PLATE E-6.1)	[4] PERVIOUS AREA INFILTRATION RATE-IN/HR (PLATE E-6.2)	[5] LAND USE	[6] DECIMAL PERCENT OF AREA IMPERVIOUS (PLATE E-6.3)	[7] ADJUSTED INFILTRATION RATE-IN/HR [4](1-.9[6])	[8] AREA SQ INCHES	[9] $\frac{[8]}{\Sigma[8]}$	[10] AVERAGE ADJUSTED INFILTRATION RATE-IN/HR [7]•[9]
C	BARREN	91	0.115	NATURAL	0	0.115	71.0 AC	1	0.115
							Σ[8]- 71.0 AC		Σ[10]- 0.115

10 YEAR/24 HOUR STORM

LAG TIME CALCULATION
$(0.8)\ T_c = (0.8)\,22.22\,min\left(\frac{1\,HR}{60\,MIN}\right)$
$= 0.2963$ HRS

VARIABLE LOSS RATE CURVE (24-HOUR STORM ONLY)

F_m = Minimum Loss Rate $\cong F/2 = \Sigma[10]/2 =$ 0.0575 IN./HR.

$C = (F-F_m)/54 = (\Sigma[10]-F_m)/54 =$ ____

$F_T = C(24-(T/60))^{1.55} + F_m =$ ____ $(24-(T/60))^{1.55} +$ ____ IN./HR.

Where:

T = Time in minutes. To get an average value for each unit time period, Use $T=\frac{1}{2}$ the unit time for the first time period, $T=1\frac{1}{2}$ unit time for the second period, etc.

RCFC & WCD HYDROLOGY MANUAL

SYNTHETIC UNIT HYDROGRAPH METHOD

Basic Data Calculation Form

Project: WATERSHED B9AA EXISTING

By: RICK HOWE Date: 7/1/19

Checked: ______ Date: ______

Sheet

LOSS RATE DATA

AVERAGE ADJUSTED LOSS RATE

[1] SOIL GROUP (PLATE C-1)	[2] COVER TYPE	[3] RI NUMBER (PLATE E-6.1)	[4] PERVIOUS AREA INFILTRATION RATE-IN/HR (PLATE E-6.2)	[5] LAND USE	[6] DECIMAL PERCENT OF AREA IMPERVIOUS (PLATE E-6.3)	[7] ADJUSTED INFILTRATION RATE-IN/HR [4](1-.9[6])	[8] AREA SQ INCHES	[9] [8]/Σ[8]	[10] AVERAGE ADJUSTED INFILTRATION RATE-IN/HR [7]•[9]
C	BARREN	91	0.115	NATURAL	0	0.115	34.7 AC	1	0.115
							Σ[8]= 34.7 AC		Σ[10]= 0.115

10 YEAR/24 HOUR STORM

LAG TIME CALCULATION

$(0.8)T_c = (0.8)(17.68\ MIN)\left(\frac{1\ HR}{60\ MIN}\right)$

$= 0.2357$ HRS

VARIABLE LOSS RATE CURVE (24-HOUR STORM ONLY)

F_m = Minimum Loss Rate $\cong F/2 = \Sigma[10]/2 =$ 0.0575 IN./HR.

$C = (F-F_m)/54 = (\Sigma[10]-F_m)/54 =$ ______

$F_T = C(24-(T/60))^{1.55} + F_m =$ ______ $(24-(T/60))^{1.55} +$ ______ IN./HR.

Where:

T = Time in minutes. To get an average value for each unit time period, Use $T = \frac{1}{2}$ the unit time for the first time period, $T = 1\frac{1}{2}$ unit time for the second period, etc.

RCFC & WCD HYDROLOGY MANUAL

SYNTHETIC UNIT HYDROGRAPH METHOD
Basic Data Calculation Form

Project: WATERSHED B8 PROPOSED
By: RICK HOWE Date: 7/1/19
Checked: ______ Date: ______
Sheet:

LOSS RATE DATA

AVERAGE ADJUSTED LOSS RATE

[1] SOIL GROUP (PLATE C-1)	[2] COVER TYPE	[3] RI NUMBER (PLATE E-6.1)	[4] PERVIOUS AREA INFILTRATION RATE-IN/HR (PLATE E-6.2)	[5] LAND USE	[6] DECIMAL PERCENT OF AREA IMPERVIOUS (PLATE E-6.3)	[7] ADJUSTED INFILTRATION RATE-IN/HR [4](1-.9[6])	[8] AREA SQ INCHES	[9] $\frac{[8]}{\Sigma[8]}$	[10] AVERAGE ADJUSTED INFILTRATION RATE-IN/HR [7]•[9]
C	BARREN	91	0.115	NATURAL	0	0.115	56.2 AC	0.663	0.0759
C	URBAN	69	0.372	COMM/IND	0.90	0.0707	26.4 AC	0.311	0.0220
C	URBAN	72	0.340	LANDSCAPE	0	0.340	2.2 AC	0.026	0.0088

Σ[8]- 84.8 AC

Σ[10]- 0.1067

USE 0.107

VARIABLE LOSS RATE CURVE (24-HOUR STORM ONLY)

F_m = Minimum Loss Rate ≅ F/2 = Σ[10]/2 = 0.0535 IN./HR.

C = $(F-F_m)/54$ = $(\Sigma[10]-F_m)/54$ = ______

$F_T = C(24-(T/60))^{1.55} + F_m$ = ______ $(24-(T/60))^{1.55}$ + ______ IN./HR.

Where:

T = Time in minutes. To get an average value for each unit time period, Use T = $\frac{1}{2}$ the unit time for the first time period, T = $1\frac{1}{2}$ unit time for the second period, etc.

10 YR/24 HR STORM

LAG TIME CALC

LT = 0.8 Tc

$= (0.8)(19.38)\left(\frac{1\ HR}{60\ m}\right)$

= 0.2584 HRS

RCFC & WCD HYDROLOGY MANUAL

SYNTHETIC UNIT HYDROGRAPH METHOD

Basic Data Calculation Form

Project: WATERSHED B9AA PROPOSED

By: RICK HOWG Date: 7/1/19

Checked ______ Date ______

Sheet

LOSS RATE DATA

AVERAGE ADJUSTED LOSS RATE

[1] SOIL GROUP (PLATE C-1)	[2] COVER TYPE	[3] RI NUMBER (PLATE E-6.1)	[4] PERVIOUS AREA INFILTRATION RATE-IN/HR (PLATE E-6.2)	[5] LAND USE	[6] DECIMAL PERCENT OF AREA IMPERVIOUS (PLATE E-6.3)	[7] ADJUSTED INFILTRATION RATE-IN/HR [4](1-.9[6])	[8] AREA SQ INCHES	[9] $\frac{[8]}{\Sigma[8]}$	[10] AVERAGE ADJUSTED INFILTRATION RATE-IN/HR [7]•[9]
C	BARREN	91	0.115	NATURAL	0	0.115	2.8 AC	0.131	0.0151
C	URBAN	69	0.372	COMM/IND	0.90	0.0707	16.3 AC	0.765	0.0541
C	URBAN	72	0.340	LANDSCAPE	0	0.340	2.2 AC	0.103	0.0350

Σ[8]= 21.3 AC Σ[10]= 0.1042

USE 0.104

10 YEAR/24 HR STORM

LAG TIME CALC

$LT = 0.8\ T_c$

$= (0.8)(13.03\ min)\left(\frac{1\ HR}{60\ m}\right)$

$= 0.1737$ HRS

VARIABLE LOSS RATE CURVE (24-HOUR STORM ONLY)

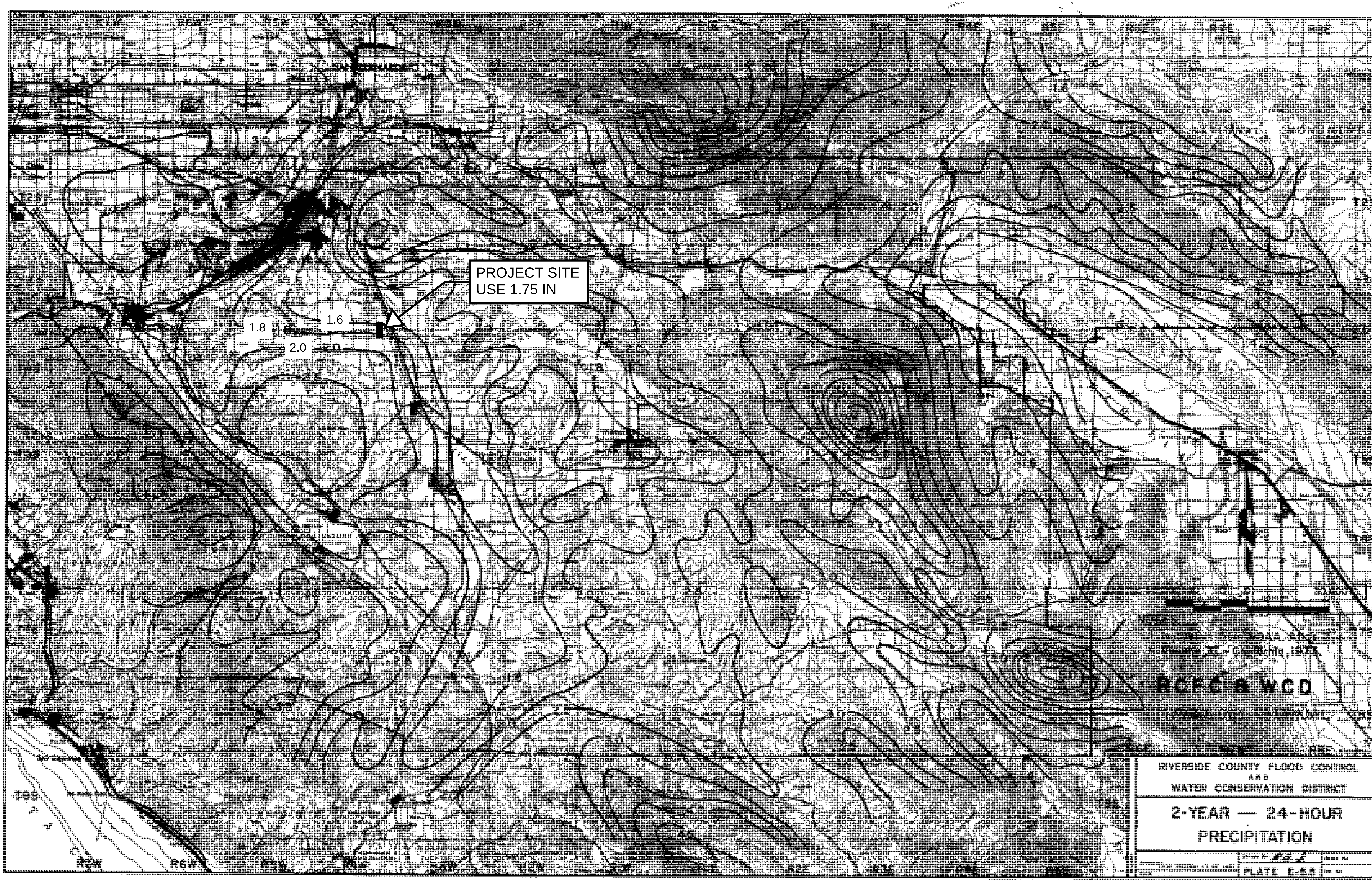
F_m = Minimum Loss Rate ≅ F/2 = Σ[10]/2 = 0.052 IN./HR.

$C = (F-F_m)/54 = (\Sigma[10]-F_m)/54 =$ ______

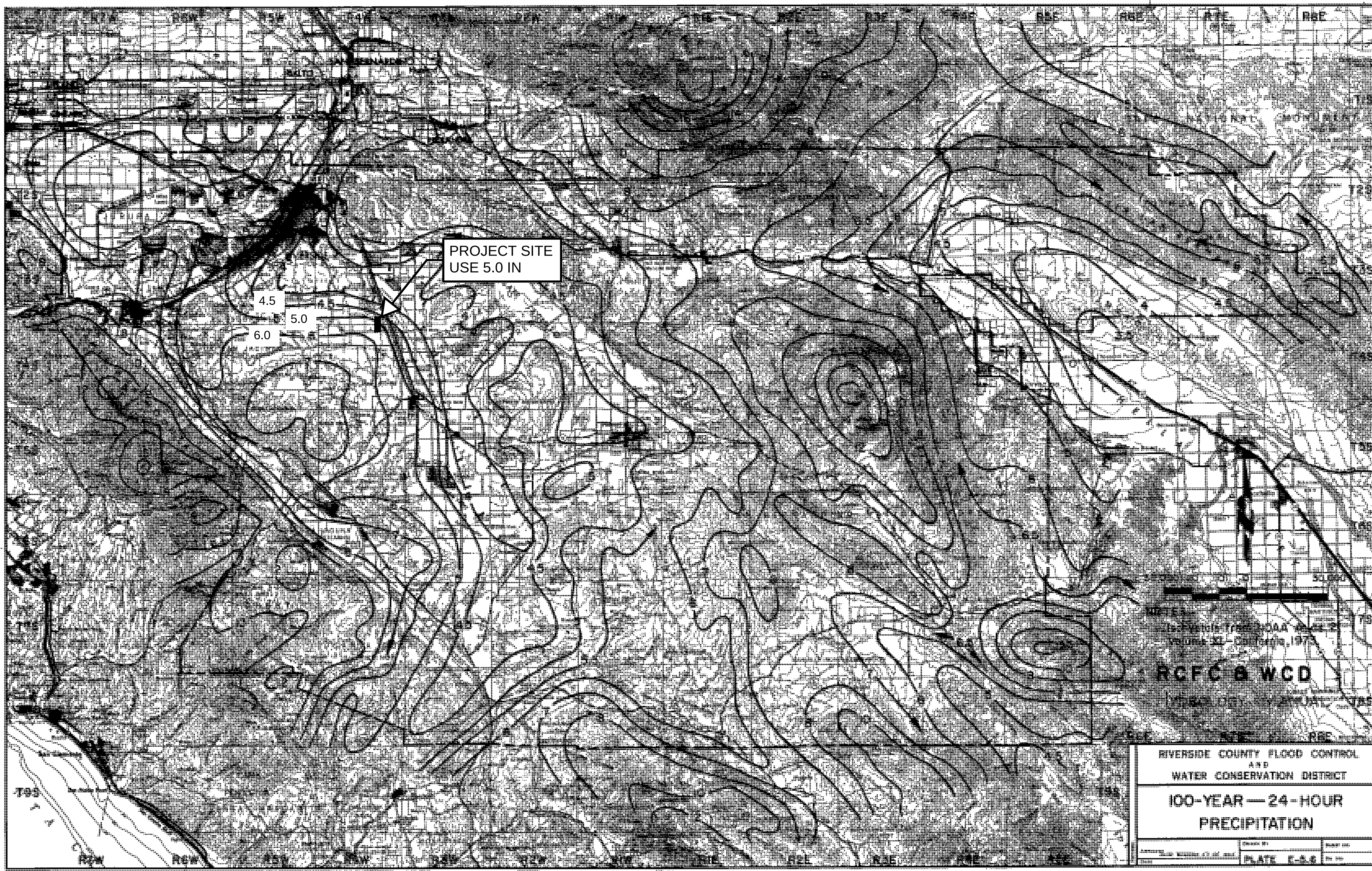
$F_T = C(24-(T/60))^{1.55}+F_m =$ ______ $(24-(T/60))^{1.55}+$ ______ IN./HR.

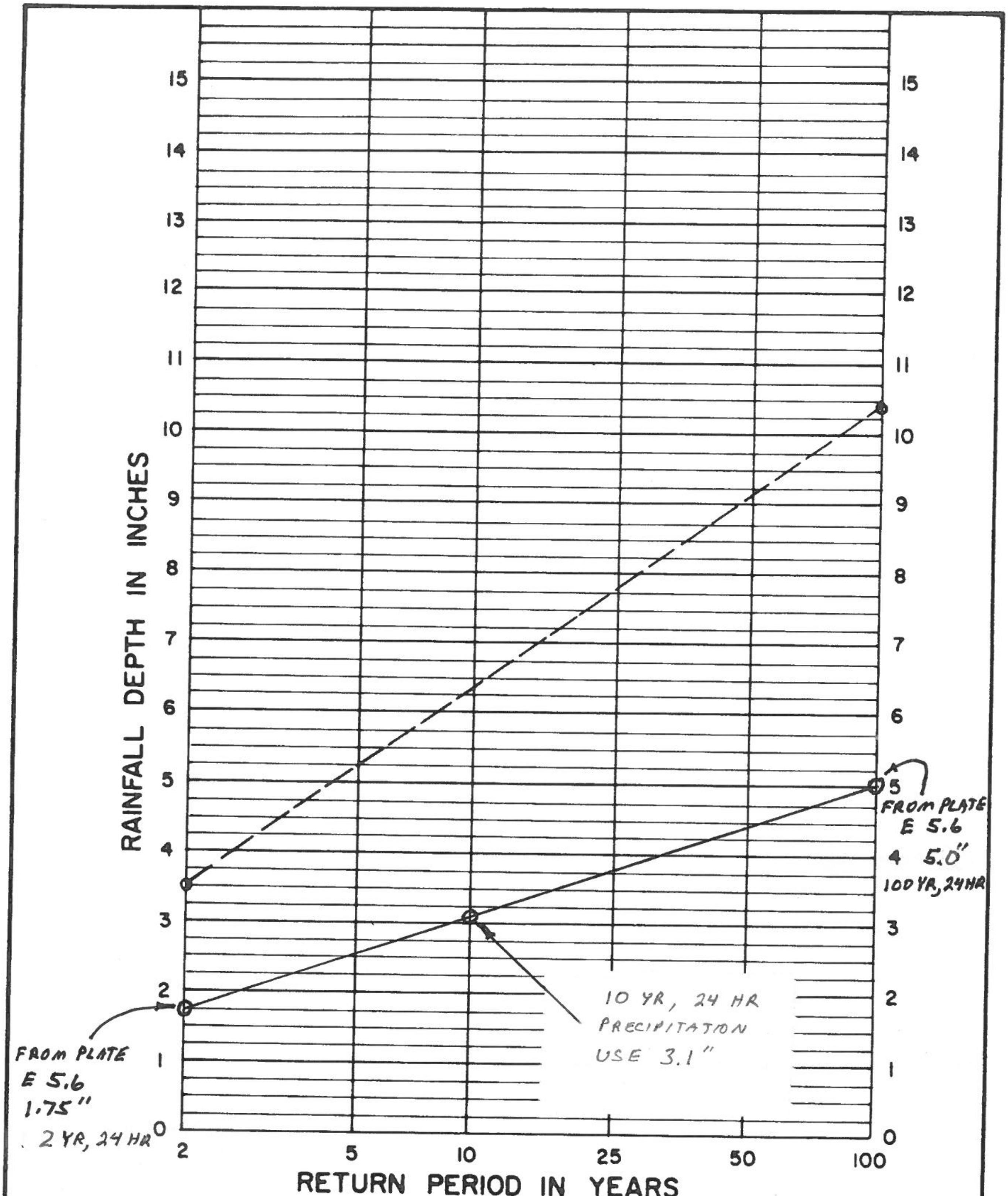
Where:

T = Time in minutes. To get an average value for each unit time period, Use $T=\frac{1}{2}$ the unit time for the first time period, $T=1\frac{1}{2}$ unit time for the second period, etc.



PROJECT SITE
USE 1.75 IN
1.8
1.6
2.0
RCFC & WCD
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
2-YEAR — 24-HOUR
PRECIPITATION
PLATE E-5.5


PROJECT SITE
USE 5.0 IN
4.5
5.0
6.0
RCFC & WCD
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR — 24-HOUR
PRECIPITATION
PLATE E-5.6



NOTE:

1. For intermediate return periods plot 2-year and 100-year values from maps for a specific duration, then connect points and read value for desired return period. For example given 2-year 24-hour = 3.50" and 100-year 24-hour = 10.40", 25-year 24-hour = 7.80"

Reference: NOAA Atlas 2, Volume XI - California, 1973.

RCFC & WCD

HYDROLOGY MANUAL

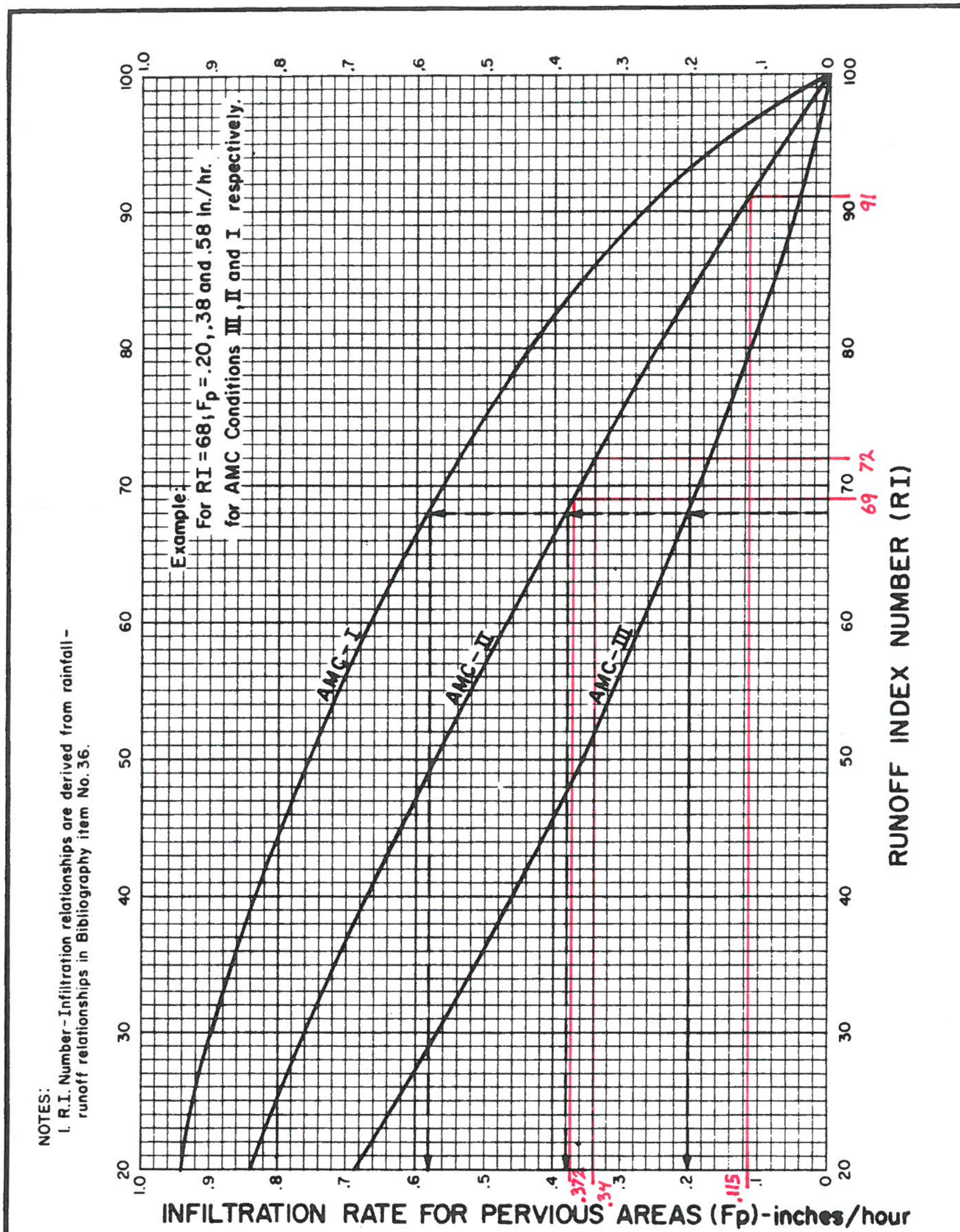
RAINFALL DEPTH VERSUS RETURN PERIOD FOR PARTIAL DURATION SERIES

RUNOFF INDEX NUMBERS OF HYDROLOGIC SOIL-COVER COMPLEXES FOR PERVIOUS AREAS-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
NATURAL COVERS -					
Barren (Rockland, eroded and graded land)		78	86	91	93
Chaparrel, Broadleaf (Manzonita, ceanothus and scrub oak)	Poor	53	70	80	85
	Fair	40	63	75	81
	Good	31	57	71	78
Chaparrel, Narrowleaf (Chamise and redshank)	Poor	71	82	88	91
	Fair	55	72	81	86
Grass, Annual or Perennial	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Meadows or Cienegas (Areas with seasonally high water table, principal vegetation is sod forming grass)	Poor	63	77	85	88
	Fair	51	70	80	84
	Good	30	58	72	78
Open Brush (Soft wood shrubs - buckwheat, sage, etc.)	Poor	62	76	84	88
	Fair	46	66	77	83
	Good	41	63	75	81
Woodland (Coniferous or broadleaf trees predominate. Canopy density is at least 50 percent)	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	28	55	70	77
Woodland, Grass (Coniferous or broadleaf trees with canopy density from 20 to 50 percent)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
URBAN COVERS -					
Residential or Commercial Landscaping (Lawn, shrubs, etc.)	Good	32	56	69	75
Turf (LARGE LANDSCAPED AREAS) (Irrigated and mowed grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
AGRICULTURAL COVERS -					
Fallow (Land plowed but not tilled or seeded)		76	85	90	92

RCFC & WCD
HYDROLOGY MANUAL

RUNOFF INDEX NUMBERS FOR PERVIOUS AREAS



RCFC & WCD
HYDROLOGY MANUAL

INFILTRATION RATE FOR PERVIOUS AREAS VERSUS RUNOFF INDEX NUMBERS

```
****************************************************************************
                 HYDRAULIC ELEMENTS - I  PROGRAM PACKAGE
         (C) Copyright 1982-2013 Advanced Engineering Software (aes)
             Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                           Analysis prepared by:




----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 14:20 07/05/2019
============================================================================
 Problem Descriptions:
  Existing Condition Lateral B-9AA


****************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =   2.500
    PIPE SLOPE(FEET/FEET) =  0.0150
    PIPEFLOW(CFS) =       55.25
    MANNINGS FRICTION FACTOR = 0.013000
============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    CRITICAL DEPTH(FEET) =      2.36
    CRITICAL FLOW AREA(SQUARE FEET) =     4.796
    CRITICAL FLOW TOP-WIDTH(FEET) =   1.164
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =        1573.53
    CRITICAL FLOW VELOCITY(FEET/SEC.) =    11.520
    CRITICAL FLOW VELOCITY HEAD(FEET) =          2.06
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =      4.12
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =          4.42
    ==>NORMAL PIPEFLOW IS PRESSURE FLOW
============================================================================
```

```
****************************************************************************
                 HYDRAULIC ELEMENTS - I  PROGRAM PACKAGE
         (C) Copyright 1982-2013 Advanced Engineering Software (aes)
             Ver. 20.0  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:





----------------------------------------------------------------------------
  TIME/DATE OF STUDY: 14:22 07/05/2019
============================================================================
 Problem Descriptions:
  Proposed Lateral B-9AA


****************************************************************************
>>>>PIPEFLOW HYDRAULIC INPUT INFORMATION<<<<
----------------------------------------------------------------------------
    PIPE DIAMETER(FEET) =   2.500
    PIPE SLOPE(FEET/FEET) =  0.0150
    PIPEFLOW(CFS) =       47.15
    MANNINGS FRICTION FACTOR = 0.013000
============================================================================
    CRITICAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    CRITICAL DEPTH(FEET) =      2.26
    CRITICAL FLOW AREA(SQUARE FEET) =     4.668
    CRITICAL FLOW TOP-WIDTH(FEET) =   1.473
    CRITICAL FLOW PRESSURE + MOMENTUM(POUNDS) =         1234.36
    CRITICAL FLOW VELOCITY(FEET/SEC.) =    10.101
    CRITICAL FLOW VELOCITY HEAD(FEET) =           1.58
    CRITICAL FLOW HYDRAULIC DEPTH(FEET) =      3.17
    CRITICAL FLOW SPECIFIC ENERGY(FEET) =           3.84
============================================================================
    NORMAL-DEPTH FLOW INFORMATION:
----------------------------------------------------------------------------
    NORMAL DEPTH(FEET) =      1.92
    FLOW AREA(SQUARE FEET) =      4.05
    FLOW TOP-WIDTH(FEET) =     2.106
    FLOW PRESSURE + MOMENTUM(POUNDS) =         1282.31
    FLOW VELOCITY(FEET/SEC.) =          11.634
    FLOW VELOCITY HEAD(FEET) =           2.102
    HYDRAULIC DEPTH(FEET) =      1.92
    FROUDE NUMBER =     1.478
    SPECIFIC ENERGY(FEET) =           4.03
============================================================================
```

```
****************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
      RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                   (RCFC&WCD)  1978 HYDROLOGY MANUAL
        (c) Copyright 1982-2013 Advanced Engineering Software (aes)
                   (Rational Tabling Version 20.0)
                Release Date: 06/01/2013  License ID 1264

                        Analysis prepared by:




 ************************** DESCRIPTION OF STUDY **************************
 * MEAD VALLEY BUSINESS PARK                                              *
 * PRELIMINARY EXISTING CONDITION RATIONAL METHOD HYDROLOGY                *
 * 10 YEAR STORM EVENT FOR WATERSHED B-8                                  *
 **************************************************************************

  FILE NAME: E10_B8.DAT
  TIME/DATE OF STUDY: 11:46 06/18/2019
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  1.880
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.780
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.690
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.120
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.4909883
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.4890234
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =   10.00   1-HOUR INTENSITY(INCH/HOUR) =   0.788
  SLOPE OF INTENSITY DURATION CURVE = 0.4910
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO  STREET-CROSSFALL:  CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)     SIDE / SIDE/ WAY   (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

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

****************************************************************************
  FLOW PROCESS FROM NODE    800.00 TO NODE    801.00 IS CODE =  21
```



```
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
       ASSUMED INITIAL SUBAREA UNIFORM
       DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   980.00
  UPSTREAM ELEVATION(FEET) =   1715.00
  DOWNSTREAM ELEVATION(FEET) =   1670.00
  ELEVATION DIFFERENCE(FEET) =     45.00
  TC = 0.533*[(  980.00**3)/(    45.00)]**.2 =   15.506
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.531
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6469
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =     10.70
  TOTAL AREA(ACRES) =     10.80   TOTAL RUNOFF(CFS) =     10.70

****************************************************************************
  FLOW PROCESS FROM NODE    801.00 TO NODE    802.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0350
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1000.00
  "V" GUTTER WIDTH(FEET) =    5.00   GUTTER HIKE(FEET) =  0.800
  PAVEMENT LIP(FEET) =  0.400   MANNING'S N = .0300
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   2.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.428
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6340
  SOIL CLASSIFICATION IS "C"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     14.54
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.03
  AVERAGE FLOW DEPTH(FEET) =   1.20   FLOOD WIDTH(FEET) =    5.00
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   2.37   Tc(MIN.) =   17.88
  SUBAREA AREA(ACRES) =    8.50      SUBAREA RUNOFF(CFS) =    7.69
  TOTAL AREA(ACRES) =       19.3        PEAK FLOW RATE(CFS) =      18.39

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

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  1.20   FLOOD WIDTH(FEET) =    5.00
  FLOW VELOCITY(FEET/SEC.) =   7.03   DEPTH*VELOCITY(FT*FT/SEC) =   8.44
  LONGEST FLOWPATH FROM NODE    800.00 TO NODE    802.00 =    1980.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    802.00 TO NODE    803.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0360
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1070.00
  "V" GUTTER WIDTH(FEET) =    5.00   GUTTER HIKE(FEET) =  0.800
  PAVEMENT LIP(FEET) =  0.400   MANNING'S N = .0300
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   2.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.339
```

```
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6218
  SOIL CLASSIFICATION IS "C"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     21.59
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.13
  AVERAGE FLOW DEPTH(FEET) =   1.20   FLOOD WIDTH(FEET) =    5.00
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   2.50   Tc(MIN.) =   20.38
  SUBAREA AREA(ACRES) =    7.70       SUBAREA RUNOFF(CFS) =    6.41
  TOTAL AREA(ACRES) =       27.0         PEAK FLOW RATE(CFS) =      24.80

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

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  1.20   FLOOD WIDTH(FEET) =    5.00
  FLOW VELOCITY(FEET/SEC.) =   7.13   DEPTH*VELOCITY(FT*FT/SEC) =   8.56
  LONGEST FLOWPATH FROM NODE    800.00 TO NODE    803.00 =    3050.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    803.00 TO NODE    804.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0090
  FLOW LENGTH(FEET) =   330.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  19.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.92
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      24.80
  PIPE TRAVEL TIME(MIN.) =   0.69    Tc(MIN.) =   21.07
  LONGEST FLOWPATH FROM NODE    800.00 TO NODE    804.00 =    3380.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    804.00 TO NODE    804.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   21.07
  RAINFALL INTENSITY(INCH/HR) =   1.32
  TOTAL STREAM AREA(ACRES) =    27.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     24.80

****************************************************************************
  FLOW PROCESS FROM NODE    805.00 TO NODE    806.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
       ASSUMED INITIAL SUBAREA UNIFORM
       DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =  1000.00
  UPSTREAM ELEVATION(FEET) =   1733.00
  DOWNSTREAM ELEVATION(FEET) =   1663.00
  ELEVATION DIFFERENCE(FEET) =     70.00
  TC = 0.533*[( 1000.00**3)/(    70.00)]**.2 =   14.368
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.589
```



```
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6536
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =     10.70
  TOTAL AREA(ACRES) =     10.30   TOTAL RUNOFF(CFS) =     10.70

****************************************************************************
  FLOW PROCESS FROM NODE    806.00 TO NODE    807.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0400
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1000.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.800
  PAVEMENT LIP(FEET) =  0.400   MANNING'S N = .0300
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   2.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.481
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6408
  SOIL CLASSIFICATION IS "C"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     15.49
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.52
  AVERAGE FLOW DEPTH(FEET) =   1.20   FLOOD WIDTH(FEET) =    5.00
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   2.22   Tc(MIN.) =   16.58
  SUBAREA AREA(ACRES) =   10.10       SUBAREA RUNOFF(CFS) =    9.59
  TOTAL AREA(ACRES) =       20.4         PEAK FLOW RATE(CFS) =      20.29

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

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  1.20   FLOOD WIDTH(FEET) =    5.00
  FLOW VELOCITY(FEET/SEC.) =   7.52   DEPTH*VELOCITY(FT*FT/SEC) =   9.02
  LONGEST FLOWPATH FROM NODE    805.00 TO NODE    807.00 =    2000.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    807.00 TO NODE    804.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0410
  CHANNEL LENGTH THRU SUBAREA(FEET) =   740.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.800
  PAVEMENT LIP(FEET) =  0.400   MANNING'S N = .0300
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   2.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.415
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6323
  SOIL CLASSIFICATION IS "C"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     25.03
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.61
  AVERAGE FLOW DEPTH(FEET) =   1.20   FLOOD WIDTH(FEET) =    5.00
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.62   Tc(MIN.) =   18.20
  SUBAREA AREA(ACRES) =   10.60       SUBAREA RUNOFF(CFS) =    9.48
  TOTAL AREA(ACRES) =       31.0         PEAK FLOW RATE(CFS) =      29.77

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

```
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) =  1.20   FLOOD WIDTH(FEET) =    5.00
 FLOW VELOCITY(FEET/SEC.) =   7.61   DEPTH*VELOCITY(FT*FT/SEC) =   9.13
 LONGEST FLOWPATH FROM NODE    805.00 TO NODE    804.00 =    2740.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    804.00 TO NODE    804.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =   18.20
 RAINFALL INTENSITY(INCH/HR) =   1.41
 TOTAL STREAM AREA(ACRES) =    31.00
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     29.77

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       24.80    21.07        1.317         27.00
     2       29.77    18.20        1.415         31.00

 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       51.20    18.20       1.415
     2       52.51    21.07       1.317

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      52.51   Tc(MIN.) =   21.07
 TOTAL AREA(ACRES) =       58.0
 LONGEST FLOWPATH FROM NODE    800.00 TO NODE    804.00 =    3380.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    804.00 TO NODE    808.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0090
 FLOW LENGTH(FEET) =   660.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  36.0 INCH PIPE IS  26.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   9.57
 ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      52.51
 PIPE TRAVEL TIME(MIN.) =   1.15     Tc(MIN.) =   22.22
 LONGEST FLOWPATH FROM NODE    800.00 TO NODE    808.00 =    4040.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    808.00 TO NODE    808.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
```



```
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   22.22
 RAINFALL INTENSITY(INCH/HR) =   1.28
 TOTAL STREAM AREA(ACRES) =    58.00
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     52.51

****************************************************************************
 FLOW PROCESS FROM NODE    809.00 TO NODE    810.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
       ASSUMED INITIAL SUBAREA UNIFORM
       DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =  1000.00
 UPSTREAM ELEVATION(FEET) =   1718.00
 DOWNSTREAM ELEVATION(FEET) =   1610.00
 ELEVATION DIFFERENCE(FEET) =    108.00
 TC = 0.533*[( 1000.00**3)/(   108.00)]**.2 =   13.174
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.658
 UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6612
 SOIL CLASSIFICATION IS "C"
 SUBAREA RUNOFF(CFS) =      7.13
 TOTAL AREA(ACRES) =      6.50   TOTAL RUNOFF(CFS) =      7.13

****************************************************************************
 FLOW PROCESS FROM NODE    810.00 TO NODE    808.00 IS CODE =  91
----------------------------------------------------------------------------
 >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0680
 CHANNEL LENGTH THRU SUBAREA(FEET) =   340.00
 "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.800
 PAVEMENT LIP(FEET) =  0.400   MANNING'S N = .0300
 PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
 MAXIMUM DEPTH(FEET) =   2.00
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.609
 UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6558
 SOIL CLASSIFICATION IS "C"
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     10.56
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.79
 AVERAGE FLOW DEPTH(FEET) =   0.80   FLOOD WIDTH(FEET) =    5.00
 "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.83   Tc(MIN.) =   14.01
 SUBAREA AREA(ACRES) =    6.50       SUBAREA RUNOFF(CFS) =    6.86
 TOTAL AREA(ACRES) =      13.0         PEAK FLOW RATE(CFS) =      13.99

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

 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) =  1.20   FLOOD WIDTH(FEET) =    5.00
 FLOW VELOCITY(FEET/SEC.) =   9.80   DEPTH*VELOCITY(FT*FT/SEC) =  11.76
 LONGEST FLOWPATH FROM NODE    809.00 TO NODE    808.00 =    1340.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    808.00 TO NODE    808.00 IS CODE =   1
----------------------------------------------------------------------------
```

```
>>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
>>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
TOTAL NUMBER OF STREAMS =  2
CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
TIME OF CONCENTRATION(MIN.) =   14.01
RAINFALL INTENSITY(INCH/HR) =   1.61
TOTAL STREAM AREA(ACRES) =    13.00
PEAK FLOW RATE(CFS) AT CONFLUENCE =     13.99

** CONFLUENCE DATA **
STREAM     RUNOFF      Tc      INTENSITY      AREA
NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
    1       51.20    19.36       1.373         58.00
    1       52.51    22.22       1.283         58.00
    2       13.99    14.01       1.609         13.00

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       51.04    14.01       1.609
    2       63.13    19.36       1.373
    3       63.66    22.22       1.283

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =      63.66   Tc(MIN.) =   22.22
TOTAL AREA(ACRES) =       71.0
LONGEST FLOWPATH FROM NODE    800.00 TO NODE    808.00 =    4040.00 FEET.
============================================================================
END OF STUDY SUMMARY:
TOTAL AREA(ACRES)     =       71.0  TC(MIN.) =     22.22
PEAK FLOW RATE(CFS)   =      63.66
*** PEAK FLOW RATE TABLE ***
       Q(CFS)   Tc(MIN.)
1       51.04      14.01
2       63.13      19.36
3       63.66      22.22
============================================================================
============================================================================
END OF RATIONAL METHOD ANALYSIS
```

```
*****************************************************************************
        RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
    RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                  (RCFC&WCD)  1978 HYDROLOGY MANUAL
       (c) Copyright 1982-2013 Advanced Engineering Software (aes)
                  (Rational Tabling Version 20.0)
               Release Date: 06/01/2013  License ID 1264

                       Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
 * OLEANDER BUSINESS PARK                                                  *
 * PRELIMINARY EXISTING CONDITION RATIONAL METHOD HYDROLOGY                *
 * 10 YEAR STORM EVENT FOR WATERSHED B-8A                                  *
 **************************************************************************

  FILE NAME: E10_B8A.DAT
  TIME/DATE OF STUDY: 07:16 03/01/2019
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  1.880
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.780
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.690
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.120
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.4909883
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.4890234
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =   10.00   1-HOUR INTENSITY(INCH/HOUR) =   0.788
  SLOPE OF INTENSITY DURATION CURVE = 0.4910
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

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

****************************************************************************
  FLOW PROCESS FROM NODE    812.00 TO NODE    813.00 IS CODE =  21
```



```
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =  1640.00
  UPSTREAM ELEVATION(FEET) =   1595.00
  DOWNSTREAM ELEVATION(FEET) =   1556.00
  ELEVATION DIFFERENCE(FEET) =     39.00
  TC = 0.533*[( 1640.00**3)/(    39.00)]**.2 =   21.732
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.297
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6157
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      3.03
  TOTAL AREA(ACRES) =      3.80   TOTAL RUNOFF(CFS) =      3.03

****************************************************************************
  FLOW PROCESS FROM NODE    813.00 TO NODE    814.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0120
  CHANNEL LENGTH THRU SUBAREA(FEET) =   260.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.800
  PAVEMENT LIP(FEET) =  0.400   MANNING'S N = .0300
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   2.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.255
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6092
  SOIL CLASSIFICATION IS "C"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      4.95
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   2.85
  AVERAGE FLOW DEPTH(FEET) =   0.80   FLOOD WIDTH(FEET) =    5.00
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.52   Tc(MIN.) =   23.25
  SUBAREA AREA(ACRES) =    5.00       SUBAREA RUNOFF(CFS) =    3.82
  TOTAL AREA(ACRES) =       8.8         PEAK FLOW RATE(CFS) =       6.86

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

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  1.20   FLOOD WIDTH(FEET) =    5.00
  FLOW VELOCITY(FEET/SEC.) =    4.12   DEPTH*VELOCITY(FT*FT/SEC) =    4.94
  LONGEST FLOWPATH FROM NODE    812.00 TO NODE    814.00 =    1900.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    815.00 TO NODE    815.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   23.25
  RAINFALL INTENSITY(INCH/HR) =   1.25
  TOTAL STREAM AREA(ACRES) =    8.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.86
```

```
 ****************************************************************************
   FLOW PROCESS FROM NODE    803.00 TO NODE    816.00 IS CODE =  21
 ----------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 ============================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
          DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
   TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
   INITIAL SUBAREA FLOW-LENGTH(FEET) =   530.00
   UPSTREAM ELEVATION(FEET) =   1596.00
   DOWNSTREAM ELEVATION(FEET) =   1575.00
   ELEVATION DIFFERENCE(FEET) =     21.00
   TC = 0.533*[(  530.00**3)/(    21.00)]**.2 =   12.489
     10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.703
   UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6658
   SOIL CLASSIFICATION IS "C"
   SUBAREA RUNOFF(CFS) =      5.78
   TOTAL AREA(ACRES) =      5.10   TOTAL RUNOFF(CFS) =      5.78

 ****************************************************************************
   FLOW PROCESS FROM NODE    816.00 TO NODE    815.00 IS CODE =  91
 ----------------------------------------------------------------------------
   >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
 ============================================================================
   REPRESENTATIVE SLOPE =  0.0340
   CHANNEL LENGTH THRU SUBAREA(FEET) =   710.00
   "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.800
   PAVEMENT LIP(FEET) =  0.400   MANNING'S N = .0300
   PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
   MAXIMUM DEPTH(FEET) =   2.00
     10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.599
   UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6547
   SOIL CLASSIFICATION IS "C"
   TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     11.07
   TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.93
   AVERAGE FLOW DEPTH(FEET) =   1.20   FLOOD WIDTH(FEET) =    5.00
   "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.71   Tc(MIN.) =   14.20
   SUBAREA AREA(ACRES) =   10.10       SUBAREA RUNOFF(CFS) =   10.57
   TOTAL AREA(ACRES) =      15.2         PEAK FLOW RATE(CFS) =      16.35

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

   END OF SUBAREA "V" GUTTER HYDRAULICS:
   DEPTH(FEET) =  1.20   FLOOD WIDTH(FEET) =    5.00
   FLOW VELOCITY(FEET/SEC.) =    6.93   DEPTH*VELOCITY(FT*FT/SEC) =   8.32
   LONGEST FLOWPATH FROM NODE    803.00 TO NODE    815.00 =    1240.00 FEET.

 ****************************************************************************
   FLOW PROCESS FROM NODE    815.00 TO NODE    815.00 IS CODE =   1
 ----------------------------------------------------------------------------
   >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
   >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
 ============================================================================
   TOTAL NUMBER OF STREAMS =  2
   CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
   TIME OF CONCENTRATION(MIN.) =   14.20
   RAINFALL INTENSITY(INCH/HR) =   1.60
```



```
   TOTAL STREAM AREA(ACRES) =    15.20
   PEAK FLOW RATE(CFS) AT CONFLUENCE =     16.35

   ** CONFLUENCE DATA **
   STREAM     RUNOFF       Tc      INTENSITY      AREA
   NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1         6.86    23.25        1.255          8.80
      2        16.35    14.20        1.599         15.20

   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        20.54    14.20       1.599
      2        19.69    23.25       1.255

   COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
   PEAK FLOW RATE(CFS) =      20.54   Tc(MIN.) =   14.20
   TOTAL AREA(ACRES) =       24.0
   LONGEST FLOWPATH FROM NODE    812.00 TO NODE    815.00 =    1900.00 FEET.

 ****************************************************************************
   FLOW PROCESS FROM NODE    815.00 TO NODE    811.00 IS CODE =  31
 ----------------------------------------------------------------------------
   >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
   >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
 ============================================================================
   REPRESENTATIVE SLOPE =  0.0066
   FLOW LENGTH(FEET) =   500.00   MANNING'S N =  0.013
   DEPTH OF FLOW IN  27.0 INCH PIPE IS  19.3 INCHES
   PIPE-FLOW VELOCITY(FEET/SEC.) =   6.75
   ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
   PIPE-FLOW(CFS) =      20.54
   PIPE TRAVEL TIME(MIN.) =   1.23    Tc(MIN.) =   15.43
   LONGEST FLOWPATH FROM NODE    812.00 TO NODE    811.00 =    2400.00 FEET.

 ****************************************************************************
   FLOW PROCESS FROM NODE    811.00 TO NODE    811.00 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.) =   15.43
   RAINFALL INTENSITY(INCH/HR) =   1.53
   TOTAL STREAM AREA(ACRES) =    24.00
   PEAK FLOW RATE(CFS) AT CONFLUENCE =     20.54

 ****************************************************************************
   FLOW PROCESS FROM NODE    804.00 TO NODE    817.00 IS CODE =  21
 ----------------------------------------------------------------------------
   >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
 ============================================================================
          ASSUMED INITIAL SUBAREA UNIFORM
          DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
   TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   730.00
  UPSTREAM ELEVATION(FEET) =   1593.00
  DOWNSTREAM ELEVATION(FEET) =   1572.00
  ELEVATION DIFFERENCE(FEET) =     21.00
  TC = 0.533*[(  730.00**3)/(    21.00)]**.2 =   15.134
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.549
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6490
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      3.02
  TOTAL AREA(ACRES) =      3.00   TOTAL RUNOFF(CFS) =      3.02

****************************************************************************
  FLOW PROCESS FROM NODE    817.00 TO NODE    818.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0260
  CHANNEL LENGTH THRU SUBAREA(FEET) =   410.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.800
  PAVEMENT LIP(FEET) =  0.400   MANNING'S N = .0300
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   2.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.473
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6399
  SOIL CLASSIFICATION IS "C"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      5.33
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.20
  AVERAGE FLOW DEPTH(FEET) =   0.80   FLOOD WIDTH(FEET) =    5.00
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.63   Tc(MIN.) =   16.76
  SUBAREA AREA(ACRES) =     4.90       SUBAREA RUNOFF(CFS) =    4.62
  TOTAL AREA(ACRES) =        7.9         PEAK FLOW RATE(CFS) =       7.64

       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) =    5.00
  FLOW VELOCITY(FEET/SEC.) =    4.20   DEPTH*VELOCITY(FT*FT/SEC) =   3.36
  LONGEST FLOWPATH FROM NODE     804.00 TO NODE    818.00 =    1140.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    818.00 TO NODE    811.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0240
  FLOW LENGTH(FEET) =   490.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS  10.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.61
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.64
  PIPE TRAVEL TIME(MIN.) =   0.95    Tc(MIN.) =   17.71
  LONGEST FLOWPATH FROM NODE     804.00 TO NODE    811.00 =    1630.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    811.00 TO NODE    811.00 IS CODE =   1
```



```
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   17.71
  RAINFALL INTENSITY(INCH/HR) =   1.43
  TOTAL STREAM AREA(ACRES) =     7.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.64

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        20.54    15.43        1.535         24.00
     1        19.69    24.49        1.223         24.00
     2         7.64    17.71        1.434          7.90

  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        27.19    15.43       1.535
     2        26.83    17.71       1.434
     3        26.20    24.49       1.223

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      27.19   Tc(MIN.) =   15.43
  TOTAL AREA(ACRES) =       31.9
  LONGEST FLOWPATH FROM NODE     812.00 TO NODE    811.00 =    2400.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       31.9  TC(MIN.) =     15.43
  PEAK FLOW RATE(CFS)   =      27.19
  *** PEAK FLOW RATE TABLE ***
         Q(CFS)   Tc(MIN.)
  1       27.19      15.43
  2       26.83      17.71
  3       26.20      24.49
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
      RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                   (RCFC&WCD)  1978 HYDROLOGY MANUAL
        (c) Copyright 1982-2013 Advanced Engineering Software (aes)
                   (Rational Tabling Version 20.0)
                Release Date: 06/01/2013  License ID 1264

                        Analysis prepared by:




 ************************** DESCRIPTION OF STUDY **************************
* MEAD VALLEY BUSINESS PARK                                                *
* PRELIMINARY EXISTING CONDITION RATIONAL METHOD HYDROLOGY                 *
* 10 YEAR STORM EVENT FOR AREA TRIBUTARY TO LATERAL B-9AA                  *
 **************************************************************************

  FILE NAME: E10_B9AA.DAT
  TIME/DATE OF STUDY: 14:27 07/03/2019
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  1.880
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.780
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.690
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.120
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.4909883
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.4890234
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =   10.00   1-HOUR INTENSITY(INCH/HOUR) =   0.788
  SLOPE OF INTENSITY DURATION CURVE = 0.4910
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO  STREET-CROSSFALL:  CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

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

****************************************************************************
  FLOW PROCESS FROM NODE    900.00 TO NODE    901.00 IS CODE =  21
```



```
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =  1000.00
  UPSTREAM ELEVATION(FEET) =   1691.00
  DOWNSTREAM ELEVATION(FEET) =   1602.00
  ELEVATION DIFFERENCE(FEET) =     89.00
  TC = 0.533*[( 1000.00**3)/(    89.00)]**.2 =   13.694
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.627
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6578
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      5.14
  TOTAL AREA(ACRES) =      4.80   TOTAL RUNOFF(CFS) =      5.14

****************************************************************************
  FLOW PROCESS FROM NODE    901.00 TO NODE    902.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0370
  CHANNEL LENGTH THRU SUBAREA(FEET) =   900.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.800
  PAVEMENT LIP(FEET) =  0.400   MANNING'S N = .0300
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   2.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.477
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6403
  SOIL CLASSIFICATION IS "C"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      7.55
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.01
  AVERAGE FLOW DEPTH(FEET) =   0.80   FLOOD WIDTH(FEET) =    5.00
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   3.00   Tc(MIN.) =   16.69
  SUBAREA AREA(ACRES) =    5.10      SUBAREA RUNOFF(CFS) =    4.82
  TOTAL AREA(ACRES) =       9.9        PEAK FLOW RATE(CFS) =       9.96

         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) =     5.00
  FLOW VELOCITY(FEET/SEC.) =   5.01   DEPTH*VELOCITY(FT*FT/SEC) =   4.01
  LONGEST FLOWPATH FROM NODE    900.00 TO NODE    902.00 =    1900.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    902.00 TO NODE    903.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0150
  CHANNEL LENGTH THRU SUBAREA(FEET) =   200.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.800
  PAVEMENT LIP(FEET) =  0.400   MANNING'S N = .0300
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   2.00
```

```
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.446
 UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6364
 SOIL CLASSIFICATION IS "C"
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     15.02
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.60
 AVERAGE FLOW DEPTH(FEET) =   1.20   FLOOD WIDTH(FEET) =    5.00
 "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.72   Tc(MIN.) =   17.41
 SUBAREA AREA(ACRES) =   11.00       SUBAREA RUNOFF(CFS) =   10.12
 TOTAL AREA(ACRES) =       20.9         PEAK FLOW RATE(CFS) =      20.08

 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) =  1.24   FLOOD WIDTH(FEET) =    9.14
 FLOW VELOCITY(FEET/SEC.) =   4.68   DEPTH*VELOCITY(FT*FT/SEC) =   5.81
 LONGEST FLOWPATH FROM NODE    900.00 TO NODE    903.00 =    2100.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    903.00 TO NODE    903.00 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.) =   17.41
 RAINFALL INTENSITY(INCH/HR) =   1.45
 TOTAL STREAM AREA(ACRES) =    20.90
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     20.08

****************************************************************************
 FLOW PROCESS FROM NODE    900.00 TO NODE    904.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   860.00
 UPSTREAM ELEVATION(FEET) =   1691.00
 DOWNSTREAM ELEVATION(FEET) =   1618.00
 ELEVATION DIFFERENCE(FEET) =     73.00
 TC = 0.533*[(  860.00**3)/(    73.00)]**.2 =   13.015
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.668
 UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6622
 SOIL CLASSIFICATION IS "C"
 SUBAREA RUNOFF(CFS) =      3.31
 TOTAL AREA(ACRES) =      3.00   TOTAL RUNOFF(CFS) =      3.31

****************************************************************************
 FLOW PROCESS FROM NODE    904.00 TO NODE    903.00 IS CODE =  91
----------------------------------------------------------------------------
 >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0580
 CHANNEL LENGTH THRU SUBAREA(FEET) =   890.00
 "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.800
 PAVEMENT LIP(FEET) =  0.400   MANNING'S N = .0300
 PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
 MAXIMUM DEPTH(FEET) =   2.00
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.537
```



```
 UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6476
 SOIL CLASSIFICATION IS "C"
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      5.90
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.27
 AVERAGE FLOW DEPTH(FEET) =   0.80   FLOOD WIDTH(FEET) =    5.00
 "V" GUTTER FLOW TRAVEL TIME(MIN.) =   2.37   Tc(MIN.) =   15.38
 SUBAREA AREA(ACRES) =    5.20       SUBAREA RUNOFF(CFS) =    5.18
 TOTAL AREA(ACRES) =        8.2         PEAK FLOW RATE(CFS) =       8.49

       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) =    5.00
 FLOW VELOCITY(FEET/SEC.) =   6.27   DEPTH*VELOCITY(FT*FT/SEC) =   5.02
 LONGEST FLOWPATH FROM NODE    900.00 TO NODE    903.00 =    1750.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    903.00 TO NODE    903.00 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.) =   15.38
 RAINFALL INTENSITY(INCH/HR) =   1.54
 TOTAL STREAM AREA(ACRES) =     8.20
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.49

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
    1        20.08    17.41        1.446         20.90
    2         8.49    15.38        1.537          8.20

 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        26.23    15.38       1.537
    2        28.07    17.41       1.446

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      28.07   Tc(MIN.) =   17.41
 TOTAL AREA(ACRES) =       29.1
 LONGEST FLOWPATH FROM NODE    900.00 TO NODE    903.00 =    2100.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    903.00 TO NODE    908.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0150
```

```
  FLOW LENGTH(FEET) =   160.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  17.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.01
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      28.07
  PIPE TRAVEL TIME(MIN.) =   0.27    Tc(MIN.) =   17.68
  LONGEST FLOWPATH FROM NODE     900.00 TO NODE    908.00 =    2260.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    908.00 TO NODE    908.00 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.) =   17.68
  RAINFALL INTENSITY(INCH/HR) =   1.44
  TOTAL STREAM AREA(ACRES) =    29.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     28.07

****************************************************************************
  FLOW PROCESS FROM NODE    905.00 TO NODE    906.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   640.00
  UPSTREAM ELEVATION(FEET) =   1653.00
  DOWNSTREAM ELEVATION(FEET) =   1603.00
  ELEVATION DIFFERENCE(FEET) =     50.00
  TC = 0.533*[(  640.00**3)/(    50.00)]**.2 =   11.758
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.754
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6708
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      3.41
  TOTAL AREA(ACRES) =      2.90   TOTAL RUNOFF(CFS) =      3.41

****************************************************************************
  FLOW PROCESS FROM NODE    906.00 TO NODE    907.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0460
  CHANNEL LENGTH THRU SUBAREA(FEET) =   810.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.800
  PAVEMENT LIP(FEET) =  0.400   MANNING'S N = .0300
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   2.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.600
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6548
  SOIL CLASSIFICATION IS "C"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      4.83
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.58
  AVERAGE FLOW DEPTH(FEET) =   0.80   FLOOD WIDTH(FEET) =    5.00
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   2.42   Tc(MIN.) =   14.18
  SUBAREA AREA(ACRES) =    2.70       SUBAREA RUNOFF(CFS) =    2.83
```



```
  TOTAL AREA(ACRES) =        5.6         PEAK FLOW RATE(CFS) =       6.24

       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) =    5.00
  FLOW VELOCITY(FEET/SEC.) =   5.58   DEPTH*VELOCITY(FT*FT/SEC) =   4.47
  LONGEST FLOWPATH FROM NODE     905.00 TO NODE    907.00 =    1450.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    907.00 TO NODE    908.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.18
  RAINFALL INTENSITY(INCH/HR) =   1.60
  TOTAL STREAM AREA(ACRES) =     5.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.24

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        26.23    15.66        1.523         29.10
     1        28.07    17.68        1.435         29.10
     2         6.24    14.18        1.600          5.60

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
     1        29.98    14.18       1.600
     2        32.17    15.66       1.523
     3        33.67    17.68       1.435

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      33.67   Tc(MIN.) =   17.68
  TOTAL AREA(ACRES) =       34.7
  LONGEST FLOWPATH FROM NODE     900.00 TO NODE    908.00 =    2260.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =       34.7  TC(MIN.) =     17.68
  PEAK FLOW RATE(CFS)    =      33.67
  *** PEAK FLOW RATE TABLE ***
         Q(CFS)   Tc(MIN.)
  1       29.98      14.18
  2       32.17      15.66
  3       33.67      17.68
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
      RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                   (RCFC&WCD)  1978 HYDROLOGY MANUAL
        (c) Copyright 1982-2013 Advanced Engineering Software (aes)
                   (Rational Tabling Version 20.0)
                Release Date: 06/01/2013  License ID 1264

                        Analysis prepared by:




 ************************** DESCRIPTION OF STUDY **************************
* OLEANDER BUSINESS PARK                                                    *
* PRELIMINARY EXISTING CONDITION RATIONAL METHOD HYDROLOGY                  *
* 100 YEAR STORM EVENT FOR WATERSHED B-8                                    *
 **************************************************************************

  FILE NAME: E100_B8.DAT
  TIME/DATE OF STUDY: 16:43 02/28/2019
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  1.880
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.780
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.690
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.120
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.4909883
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.4890234
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.120
  SLOPE OF INTENSITY DURATION CURVE = 0.4890
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.  (FT)     (FT)     SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

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

****************************************************************************
  FLOW PROCESS FROM NODE    800.00 TO NODE    801.00 IS CODE =  21
```



```
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   980.00
  UPSTREAM ELEVATION(FEET) =   1715.00
  DOWNSTREAM ELEVATION(FEET) =   1670.00
  ELEVATION DIFFERENCE(FEET) =     45.00
  TC = 0.533*[(  980.00**3)/(    45.00)]**.2 =   15.506
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.171
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7053
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =     16.54
  TOTAL AREA(ACRES) =     10.80   TOTAL RUNOFF(CFS) =     16.54

****************************************************************************
  FLOW PROCESS FROM NODE    801.00 TO NODE    802.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0350
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1000.00
  "V" GUTTER WIDTH(FEET) =    5.00   GUTTER HIKE(FEET) =  0.800
  PAVEMENT LIP(FEET) =  0.400   MANNING'S N = .0300
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =    2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.025
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6945
  SOIL CLASSIFICATION IS "C"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     22.51
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.03
  AVERAGE FLOW DEPTH(FEET) =   1.20   FLOOD WIDTH(FEET) =    5.00
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   2.37   Tc(MIN.) =   17.88
  SUBAREA AREA(ACRES) =    8.50      SUBAREA RUNOFF(CFS) =   11.95
  TOTAL AREA(ACRES) =      19.3         PEAK FLOW RATE(CFS) =      28.49

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  1.21   FLOOD WIDTH(FEET) =    5.55
  FLOW VELOCITY(FEET/SEC.) =   7.07   DEPTH*VELOCITY(FT*FT/SEC) =   8.52
  LONGEST FLOWPATH FROM NODE    800.00 TO NODE    802.00 =    1980.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    802.00 TO NODE    803.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0360
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1070.00
  "V" GUTTER WIDTH(FEET) =    5.00   GUTTER HIKE(FEET) =  0.800
  PAVEMENT LIP(FEET) =  0.400   MANNING'S N = .0300
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =    2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.900
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6843
  SOIL CLASSIFICATION IS "C"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     33.49
```

```
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =    7.18
  AVERAGE FLOW DEPTH(FEET) =   1.28   FLOOD WIDTH(FEET) =   12.58
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   2.48   Tc(MIN.) =   20.36
  SUBAREA AREA(ACRES) =    7.70       SUBAREA RUNOFF(CFS) =   10.01
  TOTAL AREA(ACRES) =       27.0         PEAK FLOW RATE(CFS) =      38.50

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  1.34   FLOOD WIDTH(FEET) =   18.52
  FLOW VELOCITY(FEET/SEC.) =   6.89   DEPTH*VELOCITY(FT*FT/SEC) =   9.20
  LONGEST FLOWPATH FROM NODE    800.00 TO NODE    803.00 =    3050.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    803.00 TO NODE    804.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0090
  FLOW LENGTH(FEET) =   330.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  22.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.92
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      38.50
  PIPE TRAVEL TIME(MIN.) =   0.62    Tc(MIN.) =   20.98
  LONGEST FLOWPATH FROM NODE    800.00 TO NODE    804.00 =    3380.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    804.00 TO NODE    804.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   20.98
  RAINFALL INTENSITY(INCH/HR) =   1.87
  TOTAL STREAM AREA(ACRES) =    27.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     38.50

****************************************************************************
  FLOW PROCESS FROM NODE    805.00 TO NODE    806.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =  1000.00
  UPSTREAM ELEVATION(FEET) =   1733.00
  DOWNSTREAM ELEVATION(FEET) =   1663.00
  ELEVATION DIFFERENCE(FEET) =     70.00
  TC = 0.533*[( 1000.00**3)/(    70.00)]**.2 =   14.368
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.253
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7110
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =     16.50
  TOTAL AREA(ACRES) =     10.30   TOTAL RUNOFF(CFS) =     16.50

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



```
  FLOW PROCESS FROM NODE    806.00 TO NODE    807.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0400
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1000.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.800
  PAVEMENT LIP(FEET) =  0.400   MANNING'S N = .0300
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.100
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7003
  SOIL CLASSIFICATION IS "C"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     23.93
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =    7.52
  AVERAGE FLOW DEPTH(FEET) =   1.20   FLOOD WIDTH(FEET) =    5.00
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   2.22   Tc(MIN.) =   16.58
  SUBAREA AREA(ACRES) =   10.10       SUBAREA RUNOFF(CFS) =   14.86
  TOTAL AREA(ACRES) =       20.4         PEAK FLOW RATE(CFS) =      31.36

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  1.22   FLOOD WIDTH(FEET) =    6.95
  FLOW VELOCITY(FEET/SEC.) =   7.62   DEPTH*VELOCITY(FT*FT/SEC) =   9.29
  LONGEST FLOWPATH FROM NODE    805.00 TO NODE    807.00 =    2000.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    807.00 TO NODE    804.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0410
  CHANNEL LENGTH THRU SUBAREA(FEET) =   740.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.800
  PAVEMENT LIP(FEET) =  0.400   MANNING'S N = .0300
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.005
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6930
  SOIL CLASSIFICATION IS "C"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     38.72
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =    7.47
  AVERAGE FLOW DEPTH(FEET) =   1.31   FLOOD WIDTH(FEET) =   16.17
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.65   Tc(MIN.) =   18.24
  SUBAREA AREA(ACRES) =   10.60       SUBAREA RUNOFF(CFS) =   14.73
  TOTAL AREA(ACRES) =       31.0         PEAK FLOW RATE(CFS) =      46.09

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  1.38   FLOOD WIDTH(FEET) =   23.05
  FLOW VELOCITY(FEET/SEC.) =   7.06   DEPTH*VELOCITY(FT*FT/SEC) =   9.74
  LONGEST FLOWPATH FROM NODE    805.00 TO NODE    804.00 =    2740.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    804.00 TO NODE    804.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
```

```
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   18.24
  RAINFALL INTENSITY(INCH/HR) =   2.01
  TOTAL STREAM AREA(ACRES) =    31.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     46.09

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        38.50    20.98        1.872        27.00
     2        46.09    18.24        2.005        31.00

  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        79.55    18.24       2.005
     2        81.54    20.98       1.872

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      81.54   Tc(MIN.) =   20.98
  TOTAL AREA(ACRES) =       58.0
  LONGEST FLOWPATH FROM NODE    800.00 TO NODE    804.00 =    3380.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    804.00 TO NODE    808.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0090
  FLOW LENGTH(FEET) =   660.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  42.0 INCH PIPE IS  31.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.65
  ESTIMATED PIPE DIAMETER(INCH) =  42.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      81.54
  PIPE TRAVEL TIME(MIN.) =   1.03    Tc(MIN.) =   22.01
  LONGEST FLOWPATH FROM NODE    800.00 TO NODE    808.00 =    4040.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    808.00 TO NODE    808.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   22.01
  RAINFALL INTENSITY(INCH/HR) =   1.83
  TOTAL STREAM AREA(ACRES) =    58.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     81.54

****************************************************************************
  FLOW PROCESS FROM NODE    809.00 TO NODE    810.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
```



```
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =  1000.00
  UPSTREAM ELEVATION(FEET) =   1718.00
  DOWNSTREAM ELEVATION(FEET) =   1610.00
  ELEVATION DIFFERENCE(FEET) =    108.00
  TC = 0.533*[( 1000.00**3)/(   108.00)]**.2 =   13.174
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.351
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7172
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =     10.96
  TOTAL AREA(ACRES) =      6.50   TOTAL RUNOFF(CFS) =     10.96

****************************************************************************
  FLOW PROCESS FROM NODE    810.00 TO NODE    808.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0680
  CHANNEL LENGTH THRU SUBAREA(FEET) =   340.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.800
  PAVEMENT LIP(FEET) =  0.400   MANNING'S N = .0300
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.302
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7142
  SOIL CLASSIFICATION IS "C"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     16.30
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   9.80
  AVERAGE FLOW DEPTH(FEET) =   1.20   FLOOD WIDTH(FEET) =    5.00
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.58   Tc(MIN.) =   13.75
  SUBAREA AREA(ACRES) =    6.50      SUBAREA RUNOFF(CFS) =   10.69
  TOTAL AREA(ACRES) =       13.0        PEAK FLOW RATE(CFS) =      21.64

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

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  1.20   FLOOD WIDTH(FEET) =    5.00
  FLOW VELOCITY(FEET/SEC.) =   9.80   DEPTH*VELOCITY(FT*FT/SEC) =  11.76
  LONGEST FLOWPATH FROM NODE    809.00 TO NODE    808.00 =    1340.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    808.00 TO NODE    808.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   13.75
  RAINFALL INTENSITY(INCH/HR) =   2.30
  TOTAL STREAM AREA(ACRES) =    13.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     21.64

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

```
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       79.55    19.27        1.952         58.00
     1       81.54    22.01        1.829         58.00
     2       21.64    13.75        2.302         13.00

 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       78.41    13.75       2.302
     2       97.91    19.27       1.952
     3       98.73    22.01       1.829

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      98.73   Tc(MIN.) =   22.01
 TOTAL AREA(ACRES) =       71.0
 LONGEST FLOWPATH FROM NODE    800.00 TO NODE    808.00 =    4040.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    808.00 TO NODE    818.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0360
 FLOW LENGTH(FEET) =   700.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  36.0 INCH PIPE IS  24.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  18.96
 ESTIMATED PIPE DIAMETER(INCH) =  36.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      98.73
 PIPE TRAVEL TIME(MIN.) =   0.62    Tc(MIN.) =   22.62
 LONGEST FLOWPATH FROM NODE    800.00 TO NODE    818.00 =    4740.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    818.00 TO NODE    811.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0240
 FLOW LENGTH(FEET) =   490.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  39.0 INCH PIPE IS  26.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  16.30
 ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      98.73
 PIPE TRAVEL TIME(MIN.) =   0.50    Tc(MIN.) =   23.13
 LONGEST FLOWPATH FROM NODE    800.00 TO NODE    811.00 =    5230.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =       71.0  TC(MIN.) =     23.13
 PEAK FLOW RATE(CFS)   =      98.73
 *** PEAK FLOW RATE TABLE ***
        Q(CFS)   Tc(MIN.)
 1       78.41      14.93
 2       97.91      20.40
 3       98.73      23.13
```



```
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

```
******************************************************************************
           RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
       RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                   (RCFC&WCD)  1978 HYDROLOGY MANUAL
         (c) Copyright 1982-2013 Advanced Engineering Software (aes)
                   (Rational Tabling Version 20.0)
                Release Date: 06/01/2013  License ID 1264

                        Analysis prepared by:




 ************************* DESCRIPTION OF STUDY *************************
* OLEANDER BUSINESS PARK                                                   *
* PRELIMINARY EXISTING CONDITION RATIONAL METHOD HYDROLOGY                 *
* 100 YEAR STORM EVENT FOR WATERSHED B-8A                                  *
 **************************************************************************

  FILE NAME: E100_B8A.DAT
  TIME/DATE OF STUDY: 06:57 03/01/2019
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  1.880
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.780
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.690
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.120
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.4909883
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.4890234
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.120
  SLOPE OF INTENSITY DURATION CURVE = 0.4890
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:   CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)    (FT)     SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0    20.0     0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

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

****************************************************************************
  FLOW PROCESS FROM NODE    812.00 TO NODE    813.00 IS CODE =  21
```



```
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =  1640.00
  UPSTREAM ELEVATION(FEET) =   1595.00
  DOWNSTREAM ELEVATION(FEET) =   1556.00
  ELEVATION DIFFERENCE(FEET) =     39.00
  TC = 0.533*[( 1640.00**3)/(    39.00)]**.2 =   21.732
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.840
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6790
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      4.75
  TOTAL AREA(ACRES) =      3.80   TOTAL RUNOFF(CFS) =      4.75

****************************************************************************
  FLOW PROCESS FROM NODE    813.00 TO NODE    814.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0120
  CHANNEL LENGTH THRU SUBAREA(FEET) =   260.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.800
  PAVEMENT LIP(FEET) =  0.400   MANNING'S N = .0300
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =    2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.798
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6751
  SOIL CLASSIFICATION IS "C"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      7.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.12
  AVERAGE FLOW DEPTH(FEET) =   1.20   FLOOD WIDTH(FEET) =    5.00
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.05   Tc(MIN.) =   22.78
  SUBAREA AREA(ACRES) =    5.00       SUBAREA RUNOFF(CFS) =    6.07
  TOTAL AREA(ACRES) =       8.8         PEAK FLOW RATE(CFS) =      10.82

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

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  1.20   FLOOD WIDTH(FEET) =    5.00
  FLOW VELOCITY(FEET/SEC.) =   4.12   DEPTH*VELOCITY(FT*FT/SEC) =   4.94
  LONGEST FLOWPATH FROM NODE    812.00 TO NODE    814.00 =    1900.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    815.00 TO NODE    815.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   22.78
  RAINFALL INTENSITY(INCH/HR) =   1.80
  TOTAL STREAM AREA(ACRES) =     8.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.82
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    803.00 TO NODE    816.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   530.00
  UPSTREAM ELEVATION(FEET) =   1596.00
  DOWNSTREAM ELEVATION(FEET) =   1575.00
  ELEVATION DIFFERENCE(FEET) =     21.00
  TC = 0.533*[(  530.00**3)/(    21.00)]**.2 =   12.489
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.413
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7210
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      8.87
  TOTAL AREA(ACRES) =      5.10   TOTAL RUNOFF(CFS) =      8.87

****************************************************************************
  FLOW PROCESS FROM NODE    816.00 TO NODE    815.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0340
  CHANNEL LENGTH THRU SUBAREA(FEET) =   710.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.800
  PAVEMENT LIP(FEET) =  0.400   MANNING'S N = .0300
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.266
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7119
  SOIL CLASSIFICATION IS "C"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     17.02
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.93
  AVERAGE FLOW DEPTH(FEET) =   1.20   FLOOD WIDTH(FEET) =    5.00
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.71   Tc(MIN.) =   14.20
  SUBAREA AREA(ACRES) =   10.10      SUBAREA RUNOFF(CFS) =   16.29
  TOTAL AREA(ACRES) =      15.2         PEAK FLOW RATE(CFS) =      25.17

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

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  1.20   FLOOD WIDTH(FEET) =     5.00
  FLOW VELOCITY(FEET/SEC.) =    6.93   DEPTH*VELOCITY(FT*FT/SEC) =   8.32
  LONGEST FLOWPATH FROM NODE    803.00 TO NODE    815.00 =    1240.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    815.00 TO NODE    815.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.20
  RAINFALL INTENSITY(INCH/HR) =   2.27
```



```
  TOTAL STREAM AREA(ACRES) =    15.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     25.17

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       10.82    22.78        1.798          8.80
     2       25.17    14.20        2.266         15.20

  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       31.91    14.20       2.266
     2       30.79    22.78       1.798

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      31.91   Tc(MIN.) =   14.20
  TOTAL AREA(ACRES) =       24.0
  LONGEST FLOWPATH FROM NODE    812.00 TO NODE    815.00 =    1900.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    815.00 TO NODE    811.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0066
  FLOW LENGTH(FEET) =   500.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  22.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.59
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      31.91
  PIPE TRAVEL TIME(MIN.) =   1.10     Tc(MIN.) =   15.29
  LONGEST FLOWPATH FROM NODE    812.00 TO NODE    811.00 =    2400.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    811.00 TO NODE    811.00 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.) =   15.29
  RAINFALL INTENSITY(INCH/HR) =   2.19
  TOTAL STREAM AREA(ACRES) =    24.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     31.91

****************************************************************************
  FLOW PROCESS FROM NODE    804.00 TO NODE    817.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   730.00
  UPSTREAM ELEVATION(FEET) =   1593.00
  DOWNSTREAM ELEVATION(FEET) =   1572.00
  ELEVATION DIFFERENCE(FEET) =     21.00
  TC = 0.533*[(  730.00**3)/(    21.00)]**.2 =   15.134
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.197
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7072
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      4.66
  TOTAL AREA(ACRES) =      3.00   TOTAL RUNOFF(CFS) =      4.66

****************************************************************************
  FLOW PROCESS FROM NODE    817.00 TO NODE    818.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0260
  CHANNEL LENGTH THRU SUBAREA(FEET) =   410.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.800
  PAVEMENT LIP(FEET) =  0.400   MANNING'S N = .0300
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.090
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6995
  SOIL CLASSIFICATION IS "C"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      8.31
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.20
  AVERAGE FLOW DEPTH(FEET) =   0.80   FLOOD WIDTH(FEET) =    5.00
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.63   Tc(MIN.) =   16.76
  SUBAREA AREA(ACRES) =     4.90       SUBAREA RUNOFF(CFS) =    7.16
  TOTAL AREA(ACRES) =        7.9         PEAK FLOW RATE(CFS) =      11.82

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

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  1.20   FLOOD WIDTH(FEET) =    5.00
  FLOW VELOCITY(FEET/SEC.) =    6.06   DEPTH*VELOCITY(FT*FT/SEC) =   7.27
  LONGEST FLOWPATH FROM NODE    804.00 TO NODE    818.00 =    1140.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    818.00 TO NODE    811.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0240
  FLOW LENGTH(FEET) =   490.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =    9.63
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.82
  PIPE TRAVEL TIME(MIN.) =   0.85     Tc(MIN.) =   17.61
  LONGEST FLOWPATH FROM NODE    804.00 TO NODE    811.00 =    1630.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    811.00 TO NODE    811.00 IS CODE =   1
----------------------------------------------------------------------------
```



```
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   17.61
  RAINFALL INTENSITY(INCH/HR) =   2.04
  TOTAL STREAM AREA(ACRES) =     7.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.82

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       31.91    15.29        2.185         24.00
      1       30.79    23.92        1.756         24.00
      2       11.82    17.61        2.040          7.90

  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       42.17    15.29       2.185
      2       41.60    17.61       2.040
      3       40.97    23.92       1.756

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      42.17   Tc(MIN.) =   15.29
  TOTAL AREA(ACRES) =       31.9
  LONGEST FLOWPATH FROM NODE    812.00 TO NODE    811.00 =    2400.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)     =       31.9  TC(MIN.) =     15.29
  PEAK FLOW RATE(CFS)   =      42.17
  *** PEAK FLOW RATE TABLE ***
         Q(CFS)   Tc(MIN.)
  1       42.17     15.29
  2       41.60     17.61
  3       40.97     23.92
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
           RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
       RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                     (RCFC&WCD)  1978 HYDROLOGY MANUAL
          (c) Copyright 1982-2013 Advanced Engineering Software (aes)
                     (Rational Tabling Version 20.0)
                  Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:



 ************************* DESCRIPTION OF STUDY *************************
* MEAD VALLEY BUSINESS PARK                                              *
* PRELIMINARY EXISTING CONDITION RATIONAL METHOD HYDROLOGY               *
* 100 YEAR STORM EVENT FOR AREA TRIBUTARY TO LATERAL B-9AA               *
 **************************************************************************

  FILE NAME: E100B9AA.DAT
  TIME/DATE OF STUDY: 14:29 07/03/2019
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  1.880
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.780
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.690
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.120
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.4909883
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.4890234
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.120
  SLOPE OF INTENSITY DURATION CURVE = 0.4890
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO  STREET-CROSSFALL:  CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0312 0.167 0.0150

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

****************************************************************************
  FLOW PROCESS FROM NODE    900.00 TO NODE    901.00 IS CODE =  21
```



```
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =  1000.00
  UPSTREAM ELEVATION(FEET) =   1691.00
  DOWNSTREAM ELEVATION(FEET) =   1602.00
  ELEVATION DIFFERENCE(FEET) =     89.00
  TC = 0.533*[( 1000.00**3)/(    89.00)]**.2 =   13.694
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.307
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7145
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      7.91
  TOTAL AREA(ACRES) =      4.80   TOTAL RUNOFF(CFS) =      7.91

****************************************************************************
  FLOW PROCESS FROM NODE    901.00 TO NODE    902.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0370
  CHANNEL LENGTH THRU SUBAREA(FEET) =   900.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.800
  PAVEMENT LIP(FEET) =  0.400   MANNING'S N = .0300
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.153
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7041
  SOIL CLASSIFICATION IS "C"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     11.78
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.23
  AVERAGE FLOW DEPTH(FEET) =   1.20   FLOOD WIDTH(FEET) =    5.00
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   2.07   Tc(MIN.) =   15.77
  SUBAREA AREA(ACRES) =    5.10      SUBAREA RUNOFF(CFS) =    7.73
  TOTAL AREA(ACRES) =       9.9        PEAK FLOW RATE(CFS) =     15.64

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

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  1.20   FLOOD WIDTH(FEET) =    5.00
  FLOW VELOCITY(FEET/SEC.) =   7.23   DEPTH*VELOCITY(FT*FT/SEC) =   8.68
  LONGEST FLOWPATH FROM NODE    900.00 TO NODE    902.00 =    1900.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    902.00 TO NODE    903.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0150
  CHANNEL LENGTH THRU SUBAREA(FEET) =   200.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.800
  PAVEMENT LIP(FEET) =  0.400   MANNING'S N = .0300
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.105
```

```
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7006
  SOIL CLASSIFICATION IS "C"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     23.75
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   4.52
  AVERAGE FLOW DEPTH(FEET) =   1.32   FLOOD WIDTH(FEET) =   16.64
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   0.74   Tc(MIN.) =   16.51
  SUBAREA AREA(ACRES) =   11.00       SUBAREA RUNOFF(CFS) =   16.23
  TOTAL AREA(ACRES) =       20.9          PEAK FLOW RATE(CFS) =      31.87

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  1.43   FLOOD WIDTH(FEET) =   28.05
  FLOW VELOCITY(FEET/SEC.) =   4.08   DEPTH*VELOCITY(FT*FT/SEC) =   5.84
  LONGEST FLOWPATH FROM NODE    900.00 TO NODE    903.00 =    2100.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    903.00 TO NODE    903.00 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.) =   16.51
  RAINFALL INTENSITY(INCH/HR) =   2.11
  TOTAL STREAM AREA(ACRES) =    20.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     31.87

****************************************************************************
  FLOW PROCESS FROM NODE    900.00 TO NODE    904.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   860.00
  UPSTREAM ELEVATION(FEET) =   1691.00
  DOWNSTREAM ELEVATION(FEET) =   1618.00
  ELEVATION DIFFERENCE(FEET) =     73.00
  TC = 0.533*[(  860.00**3)/(    73.00)]**.2 =   13.015
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.365
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7181
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      5.09
  TOTAL AREA(ACRES) =      3.00   TOTAL RUNOFF(CFS) =      5.09

****************************************************************************
  FLOW PROCESS FROM NODE    904.00 TO NODE    903.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0580
  CHANNEL LENGTH THRU SUBAREA(FEET) =   890.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.800
  PAVEMENT LIP(FEET) =  0.400   MANNING'S N = .0300
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.179
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7060
```



```
  SOIL CLASSIFICATION IS "C"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      9.09
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   6.27
  AVERAGE FLOW DEPTH(FEET) =   0.80   FLOOD WIDTH(FEET) =    5.00
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   2.37   Tc(MIN.) =   15.38
  SUBAREA AREA(ACRES) =    5.20       SUBAREA RUNOFF(CFS) =    8.00
  TOTAL AREA(ACRES) =        8.2         PEAK FLOW RATE(CFS) =      13.09

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

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  1.20   FLOOD WIDTH(FEET) =    5.00
  FLOW VELOCITY(FEET/SEC.) =   9.05   DEPTH*VELOCITY(FT*FT/SEC) = 10.86
  LONGEST FLOWPATH FROM NODE    900.00 TO NODE    903.00 =    1750.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    903.00 TO NODE    903.00 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.) =   15.38
  RAINFALL INTENSITY(INCH/HR) =   2.18
  TOTAL STREAM AREA(ACRES) =     8.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     13.09

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        31.87    16.51        2.105         20.90
     2        13.09    15.38        2.179          8.20

  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        42.79    15.38       2.179
     2        44.52    16.51       2.105

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      44.52   Tc(MIN.) =   16.51
  TOTAL AREA(ACRES) =       29.1
  LONGEST FLOWPATH FROM NODE    900.00 TO NODE    903.00 =    2100.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    903.00 TO NODE    908.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0150
  FLOW LENGTH(FEET) =   160.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  30.0 INCH PIPE IS  23.0 INCHES
```

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.03
  ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      44.52
  PIPE TRAVEL TIME(MIN.) =   0.24    Tc(MIN.) =   16.75
  LONGEST FLOWPATH FROM NODE    900.00 TO NODE    908.00 =    2260.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    908.00 TO NODE    908.00 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.) =   16.75
  RAINFALL INTENSITY(INCH/HR) =   2.09
  TOTAL STREAM AREA(ACRES) =    29.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     44.52

****************************************************************************
  FLOW PROCESS FROM NODE    905.00 TO NODE    906.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   640.00
  UPSTREAM ELEVATION(FEET) =   1653.00
  DOWNSTREAM ELEVATION(FEET) =   1603.00
  ELEVATION DIFFERENCE(FEET) =     50.00
  TC = 0.533*[(  640.00**3)/(    50.00)]**.2 =   11.758
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.485
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7252
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      5.23
  TOTAL AREA(ACRES) =      2.90   TOTAL RUNOFF(CFS) =      5.23

****************************************************************************
  FLOW PROCESS FROM NODE    906.00 TO NODE    907.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0460
  CHANNEL LENGTH THRU SUBAREA(FEET) =   810.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.800
  PAVEMENT LIP(FEET) =  0.400   MANNING'S N = .0300
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.268
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7120
  SOIL CLASSIFICATION IS "C"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =      7.41
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   5.58
  AVERAGE FLOW DEPTH(FEET) =   0.80   FLOOD WIDTH(FEET) =    5.00
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   2.42   Tc(MIN.) =   14.18
  SUBAREA AREA(ACRES) =     2.70       SUBAREA RUNOFF(CFS) =    4.36
  TOTAL AREA(ACRES) =       5.6        PEAK FLOW RATE(CFS) =      9.59
```



```
       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) =    5.00
  FLOW VELOCITY(FEET/SEC.) =   5.58   DEPTH*VELOCITY(FT*FT/SEC) =   4.47
  LONGEST FLOWPATH FROM NODE    905.00 TO NODE    907.00 =    1450.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    907.00 TO NODE    908.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =   14.18
  RAINFALL INTENSITY(INCH/HR) =   2.27
  TOTAL STREAM AREA(ACRES) =     5.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.59

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       42.79    15.62        2.163         29.10
      1       44.52    16.75        2.090         29.10
      2        9.59    14.18        2.268          5.60

  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       48.41    14.18       2.268
      2       51.93    15.62       2.163
      3       53.35    16.75       2.090

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      53.35   Tc(MIN.) =   16.75
  TOTAL AREA(ACRES) =       34.7
  LONGEST FLOWPATH FROM NODE    900.00 TO NODE    908.00 =    2260.00 FEET.
============================================================================
  END OF STUDY SUMMARY:
  TOTAL AREA(ACRES)      =       34.7  TC(MIN.) =     16.75
  PEAK FLOW RATE(CFS)    =      53.35
  *** PEAK FLOW RATE TABLE ***
         Q(CFS)   Tc(MIN.)
  1       48.41      14.18
  2       51.93      15.62
  3       53.35      16.75
============================================================================
============================================================================
  END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
      RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                   (RCFC&WCD)  1978 HYDROLOGY MANUAL
        (c) Copyright 1982-2013 Advanced Engineering Software (aes)
                   (Rational Tabling Version 20.0)
                Release Date: 06/01/2013  License ID 1264

                        Analysis prepared by:



 ************************** DESCRIPTION OF STUDY **************************
* MEAD VALLEY BUSINESS PARK                                                 *
* PRELIMINARY PROPOSED CONDITION RATIONAL METHOD HYDROLOGY                   *
* 10 YEAR STORM EVENT FOR AREA TRIBUTARY TO LATERAL B-8                     *
 **************************************************************************

  FILE NAME: P10_B8.DAT
  TIME/DATE OF STUDY: 11:18 07/03/2019
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  1.880
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.780
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.690
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.120
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.4909883
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.4890234
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =   10.00   1-HOUR INTENSITY(INCH/HOUR) =   0.788
  SLOPE OF INTENSITY DURATION CURVE = 0.4910
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:  CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

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

****************************************************************************
  FLOW PROCESS FROM NODE    800.00 TO NODE    801.00 IS CODE =  21
```



```
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   980.00
  UPSTREAM ELEVATION(FEET) =   1715.00
  DOWNSTREAM ELEVATION(FEET) =   1670.00
  ELEVATION DIFFERENCE(FEET) =     45.00
  TC = 0.533*[(  980.00**3)/(    45.00)]**.2 =   15.506
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.531
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6469
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =     10.70
  TOTAL AREA(ACRES) =     10.80   TOTAL RUNOFF(CFS) =     10.70

****************************************************************************
  FLOW PROCESS FROM NODE    801.00 TO NODE    802.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0390
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1230.00
  "V" GUTTER WIDTH(FEET) =    5.00   GUTTER HIKE(FEET) =  0.800
  PAVEMENT LIP(FEET) =  0.400   MANNING'S N = .0300
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   2.00
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.413
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6320
  SOIL CLASSIFICATION IS "C"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     14.98
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.42
  AVERAGE FLOW DEPTH(FEET) =   1.20   FLOOD WIDTH(FEET) =    5.00
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   2.76   Tc(MIN.) =   18.27
  SUBAREA AREA(ACRES) =    9.60      SUBAREA RUNOFF(CFS) =    8.57
  TOTAL AREA(ACRES) =      20.4        PEAK FLOW RATE(CFS) =      19.27

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

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  1.20   FLOOD WIDTH(FEET) =    5.00
  FLOW VELOCITY(FEET/SEC.) =   7.42   DEPTH*VELOCITY(FT*FT/SEC) =   8.91
  LONGEST FLOWPATH FROM NODE    800.00 TO NODE    802.00 =    2210.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    802.00 TO NODE    803.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =   300.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.01
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     19.27
```

```
 PIPE TRAVEL TIME(MIN.) =    0.50    Tc(MIN.) =   18.77
 LONGEST FLOWPATH FROM NODE    800.00 TO NODE    803.00 =    2510.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    803.00 TO NODE    803.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   18.77
 RAINFALL INTENSITY(INCH/HR) =   1.39
 TOTAL STREAM AREA(ACRES) =    20.40
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     19.27

****************************************************************************
 FLOW PROCESS FROM NODE    804.00 TO NODE    805.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =  1000.00
 UPSTREAM ELEVATION(FEET) =   1733.00
 DOWNSTREAM ELEVATION(FEET) =   1663.00
 ELEVATION DIFFERENCE(FEET) =     70.00
 TC = 0.533*[( 1000.00**3)/(    70.00)]**.2 =   14.368
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.589
 UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6536
 SOIL CLASSIFICATION IS "C"
 SUBAREA RUNOFF(CFS) =     10.70
 TOTAL AREA(ACRES) =     10.30   TOTAL RUNOFF(CFS) =     10.70

****************************************************************************
 FLOW PROCESS FROM NODE    805.00 TO NODE    806.00 IS CODE =  91
----------------------------------------------------------------------------
 >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0400
 CHANNEL LENGTH THRU SUBAREA(FEET) =   850.00
 "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.800
 PAVEMENT LIP(FEET) =  0.400   MANNING'S N = .0300
 PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
 MAXIMUM DEPTH(FEET) =   2.00
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.496
 UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6427
 SOIL CLASSIFICATION IS "C"
 TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     15.99
 TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =    7.52
 AVERAGE FLOW DEPTH(FEET) =   1.20   FLOOD WIDTH(FEET) =    5.00
 "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.88   Tc(MIN.) =   16.25
 SUBAREA AREA(ACRES) =   11.00       SUBAREA RUNOFF(CFS) =   10.58
 TOTAL AREA(ACRES) =       21.3         PEAK FLOW RATE(CFS) =      21.28

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



```
 END OF SUBAREA "V" GUTTER HYDRAULICS:
 DEPTH(FEET) =  1.20   FLOOD WIDTH(FEET) =    5.00
 FLOW VELOCITY(FEET/SEC.) =    7.52   DEPTH*VELOCITY(FT*FT/SEC) =   9.02
 LONGEST FLOWPATH FROM NODE    804.00 TO NODE    806.00 =    1850.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    806.00 TO NODE    803.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0200
 FLOW LENGTH(FEET) =   120.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  14.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  10.46
 ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      21.28
 PIPE TRAVEL TIME(MIN.) =    0.19    Tc(MIN.) =   16.44
 LONGEST FLOWPATH FROM NODE    804.00 TO NODE    803.00 =    1970.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    803.00 TO NODE    803.00 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.) =   16.44
 RAINFALL INTENSITY(INCH/HR) =   1.49
 TOTAL STREAM AREA(ACRES) =    21.30
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     21.28

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       19.27    18.77        1.394         20.40
     2       21.28    16.44        1.487         21.30

 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       38.16    16.44       1.487
     2       39.20    18.77       1.394

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      39.20   Tc(MIN.) =   18.77
 TOTAL AREA(ACRES) =       41.7
 LONGEST FLOWPATH FROM NODE    800.00 TO NODE    803.00 =    2510.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    803.00 TO NODE    807.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
```

```
================================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =   490.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  20.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.88
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      39.20
  PIPE TRAVEL TIME(MIN.) =   0.69    Tc(MIN.) =   19.45
  LONGEST FLOWPATH FROM NODE    800.00 TO NODE    807.00 =    3000.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE    807.00 TO NODE    807.00 IS CODE =   1
--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   19.45
  RAINFALL INTENSITY(INCH/HR) =   1.37
  TOTAL STREAM AREA(ACRES) =    41.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     39.20

********************************************************************************
  FLOW PROCESS FROM NODE    808.00 TO NODE    809.00 IS CODE =  21
--------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
================================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   570.00
  UPSTREAM ELEVATION(FEET) =   1704.00
  DOWNSTREAM ELEVATION(FEET) =   1648.00
  ELEVATION DIFFERENCE(FEET) =      56.00
  TC = 0.533*[(  570.00**3)/(    56.00)]**.2 =   10.722
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.835
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6785
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      2.37
  TOTAL AREA(ACRES) =      1.90   TOTAL RUNOFF(CFS) =      2.37

********************************************************************************
  FLOW PROCESS FROM NODE    809.00 TO NODE    807.00 IS CODE =  31
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.06
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.37
  PIPE TRAVEL TIME(MIN.) =   0.41    Tc(MIN.) =   11.13
  LONGEST FLOWPATH FROM NODE    808.00 TO NODE    807.00 =     720.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE    807.00 TO NODE    807.00 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.) =   11.13
  RAINFALL INTENSITY(INCH/HR) =   1.80
  TOTAL STREAM AREA(ACRES) =     1.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.37

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        38.16    17.13        1.458         41.70
     1        39.20    19.45        1.370         41.70
     2         2.37    11.13        1.801          1.90

  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        27.16    11.13       1.801
     2        40.07    17.13       1.458
     3        41.00    19.45       1.370

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      41.00   Tc(MIN.) =   19.45
  TOTAL AREA(ACRES) =       43.6
  LONGEST FLOWPATH FROM NODE    800.00 TO NODE    807.00 =    3000.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE    807.00 TO NODE    810.00 IS CODE =  31
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =   240.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  22.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.42
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      41.00
  PIPE TRAVEL TIME(MIN.) =   0.42    Tc(MIN.) =   19.88
  LONGEST FLOWPATH FROM NODE    800.00 TO NODE    810.00 =    3240.00 FEET.

********************************************************************************
  FLOW PROCESS FROM NODE    810.00 TO NODE    810.00 IS CODE =   1
--------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
================================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   19.88
  RAINFALL INTENSITY(INCH/HR) =   1.36
  TOTAL STREAM AREA(ACRES) =    43.60
```

```
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     41.00

****************************************************************************
  FLOW PROCESS FROM NODE    811.00 TO NODE    812.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   720.00
  UPSTREAM ELEVATION(FEET) =   1718.00
  DOWNSTREAM ELEVATION(FEET) =   1649.00
  ELEVATION DIFFERENCE(FEET) =     69.00
  TC = 0.533*[(  720.00**3)/(    69.00)]**.2 =   11.831
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.748
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6703
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      2.70
  TOTAL AREA(ACRES) =      2.30   TOTAL RUNOFF(CFS) =      2.70

****************************************************************************
  FLOW PROCESS FROM NODE    812.00 TO NODE    810.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.27
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.70
  PIPE TRAVEL TIME(MIN.) =   0.40    Tc(MIN.) =   12.23
  LONGEST FLOWPATH FROM NODE    811.00 TO NODE    810.00 =     870.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    810.00 TO NODE    810.00 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.) =   12.23
  RAINFALL INTENSITY(INCH/HR) =   1.72
  TOTAL STREAM AREA(ACRES) =     2.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.70

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       27.16    11.61        1.764         43.60
      1       40.07    17.56        1.440         43.60
      1       41.00    19.88        1.355         43.60
      2        2.70    12.23        1.720          2.30

  RAINFALL INTENSITY AND TIME OF CONCENTRATION RATIO
```



```
  CONFLUENCE FORMULA USED FOR  2 STREAMS.

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)
      1       29.72    11.61       1.764
      2       30.61    12.23       1.720
      3       42.33    17.56       1.440
      4       43.13    19.88       1.355

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      43.13   Tc(MIN.) =   19.88
  TOTAL AREA(ACRES) =       45.9
  LONGEST FLOWPATH FROM NODE    800.00 TO NODE    810.00 =    3240.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    810.00 TO NODE    813.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =   320.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  23.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.50
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      43.13
  PIPE TRAVEL TIME(MIN.) =   0.56    Tc(MIN.) =   20.44
  LONGEST FLOWPATH FROM NODE    800.00 TO NODE    813.00 =    3560.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    813.00 TO NODE    813.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    814.00 TO NODE    815.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =  1190.00
  UPSTREAM ELEVATION(FEET) =   1691.00
  DOWNSTREAM ELEVATION(FEET) =   1605.00
  ELEVATION DIFFERENCE(FEET) =     86.00
  TC = 0.533*[( 1190.00**3)/(    86.00)]**.2 =   15.305
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.541
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6480
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      3.99
  TOTAL AREA(ACRES) =      4.00   TOTAL RUNOFF(CFS) =      3.99

****************************************************************************
  FLOW PROCESS FROM NODE    815.00 TO NODE    816.00 IS CODE =  31
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =    670.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   8.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.81
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.99
  PIPE TRAVEL TIME(MIN.) =   1.64    Tc(MIN.) =   16.95
  LONGEST FLOWPATH FROM NODE    814.00 TO NODE    816.00 =    1860.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    816.00 TO NODE    816.00 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.) =   16.95
  RAINFALL INTENSITY(INCH/HR) =   1.47
  TOTAL STREAM AREA(ACRES) =     4.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.99

****************************************************************************
  FLOW PROCESS FROM NODE    817.00 TO NODE    818.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
       ASSUMED INITIAL SUBAREA UNIFORM
       DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   460.00
  UPSTREAM ELEVATION(FEET) =   1702.00
  DOWNSTREAM ELEVATION(FEET) =   1620.00
  ELEVATION DIFFERENCE(FEET) =     82.00
  TC = 0.533*[(  460.00**3)/(   82.00)]**.2 =    8.736
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.029
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6949
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      3.38
  TOTAL AREA(ACRES) =      2.40   TOTAL RUNOFF(CFS) =      3.38

****************************************************************************
  FLOW PROCESS FROM NODE    818.00 TO NODE    816.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =    140.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.60
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.38
  PIPE TRAVEL TIME(MIN.) =   0.35    Tc(MIN.) =    9.09
  LONGEST FLOWPATH FROM NODE    817.00 TO NODE    816.00 =     600.00 FEET.
```



```
****************************************************************************
  FLOW PROCESS FROM NODE    816.00 TO NODE    816.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.09
  RAINFALL INTENSITY(INCH/HR) =   1.99
  TOTAL STREAM AREA(ACRES) =     2.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.38

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1         3.99    16.95        1.466          4.00
     2         3.38     9.09        1.990          2.40

  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         5.53     9.09       1.990
     2         6.49    16.95       1.466

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       6.49   Tc(MIN.) =   16.95
  TOTAL AREA(ACRES) =        6.4
  LONGEST FLOWPATH FROM NODE    814.00 TO NODE    816.00 =    1860.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    816.00 TO NODE    819.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =    380.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   9.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.75
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.49
  PIPE TRAVEL TIME(MIN.) =   0.82    Tc(MIN.) =   17.76
  LONGEST FLOWPATH FROM NODE    814.00 TO NODE    819.00 =    2240.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    819.00 TO NODE    819.00 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.) =   17.76
  RAINFALL INTENSITY(INCH/HR) =   1.43
  TOTAL STREAM AREA(ACRES) =     6.40
```

```
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.49

****************************************************************************
  FLOW PROCESS FROM NODE    820.00 TO NODE    821.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1690.00
  DOWNSTREAM ELEVATION(FEET) =   1644.00
  ELEVATION DIFFERENCE(FEET) =     46.00
  TC = 0.533*[(  100.00**3)/(    46.00)]**.2 =    3.925
  COMPUTED TIME OF CONCENTRATION INCREASED TO 5 MIN.
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.669
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7350
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      0.78
  TOTAL AREA(ACRES) =      0.40   TOTAL RUNOFF(CFS) =      0.78

****************************************************************************
  FLOW PROCESS FROM NODE    821.00 TO NODE    819.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   3.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.61
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       0.78
  PIPE TRAVEL TIME(MIN.) =   0.54    Tc(MIN.) =    5.54
  LONGEST FLOWPATH FROM NODE    820.00 TO NODE    819.00 =     250.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    819.00 TO NODE    819.00 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.) =    5.54
  RAINFALL INTENSITY(INCH/HR) =   2.54
  TOTAL STREAM AREA(ACRES) =     0.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      0.78

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)      (MIN.)   (INCH/HOUR)    (ACRE)
      1        5.53      9.93        1.905         6.40
      1        6.49     17.76        1.432         6.40
      2        0.78      5.54        2.537         0.40

  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        3.87     5.54       2.537
      2        6.12     9.93       1.905
      3        6.93    17.76       1.432

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       6.93   Tc(MIN.) =   17.76
  TOTAL AREA(ACRES) =        6.8
  LONGEST FLOWPATH FROM NODE     814.00 TO NODE    819.00 =    2240.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    819.00 TO NODE    822.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS  10.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.85
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.93
  PIPE TRAVEL TIME(MIN.) =   0.32    Tc(MIN.) =   18.08
  LONGEST FLOWPATH FROM NODE     814.00 TO NODE    822.00 =    2390.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    822.00 TO NODE    822.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   18.08
  RAINFALL INTENSITY(INCH/HR) =   1.42
  TOTAL STREAM AREA(ACRES) =     6.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.93

****************************************************************************
  FLOW PROCESS FROM NODE    814.00 TO NODE    823.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   410.00
  UPSTREAM ELEVATION(FEET) =   1691.00
  DOWNSTREAM ELEVATION(FEET) =   1644.00
  ELEVATION DIFFERENCE(FEET) =     47.00
  TC = 0.533*[(  410.00**3)/(    47.00)]**.2 =    9.113
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.987
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6916
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      4.81
```

```
  TOTAL AREA(ACRES) =      3.50   TOTAL RUNOFF(CFS) =      4.81

****************************************************************************
  FLOW PROCESS FROM NODE    823.00 TO NODE    822.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =   170.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.25
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.81
  PIPE TRAVEL TIME(MIN.) =   0.39    Tc(MIN.) =    9.50
  LONGEST FLOWPATH FROM NODE    814.00 TO NODE    822.00 =     580.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    822.00 TO NODE    822.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.50
  RAINFALL INTENSITY(INCH/HR) =   1.95
  TOTAL STREAM AREA(ACRES) =     3.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.81

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        3.87     5.91        2.458          6.80
      1        6.12    10.26        1.875          6.80
      1        6.93    18.08        1.420          6.80
      2        4.81     9.50        1.947          3.50

  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        6.86     5.91       2.458
      2       10.47     9.50       1.947
      3       10.75    10.26       1.875
      4       10.44    18.08       1.420

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      10.75   Tc(MIN.) =   10.26
  TOTAL AREA(ACRES) =       10.3
  LONGEST FLOWPATH FROM NODE    814.00 TO NODE    822.00 =    2390.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    822.00 TO NODE    813.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```



```
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.78
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.75
  PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =   10.45
  LONGEST FLOWPATH FROM NODE    814.00 TO NODE    813.00 =    2490.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    813.00 TO NODE    813.00 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        6.86     6.12        2.416       10.30
      2       10.47     9.69        1.928       10.30
      3       10.75    10.45        1.858       10.30
      4       10.44    18.27        1.412       10.30
  LONGEST FLOWPATH FROM NODE    814.00 TO NODE    813.00 =    2490.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY     AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
      1       29.72    12.22        1.721       45.90
      2       30.61    12.84        1.680       45.90
      3       42.33    18.12        1.418       45.90
      4       43.13    20.44        1.337       45.90
  LONGEST FLOWPATH FROM NODE    800.00 TO NODE    813.00 =    3560.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      21.75      6.12        2.416
      2      34.05      9.69        1.928
      3      36.16     10.45        1.858
      4      39.68     12.22        1.721
      5      40.32     12.84        1.680
      6      52.68     18.12        1.418
      7      52.59     18.27        1.412
      8      53.00     20.44        1.337

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      53.00   Tc(MIN.) =   20.44
  TOTAL AREA(ACRES) =       56.2

****************************************************************************
  FLOW PROCESS FROM NODE    813.00 TO NODE    813.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

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

```
 FLOW PROCESS FROM NODE    813.00 TO NODE    824.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0400
 FLOW LENGTH(FEET) =   510.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  20.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  16.73
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      53.00
 PIPE TRAVEL TIME(MIN.) =   0.51    Tc(MIN.) =   20.95
 LONGEST FLOWPATH FROM NODE    800.00 TO NODE    824.00 =    4070.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    824.00 TO NODE    824.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE    825.00 TO NODE    826.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
       ASSUMED INITIAL SUBAREA UNIFORM
       DEVELOPMENT IS COMMERCIAL
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   290.00
 UPSTREAM ELEVATION(FEET) =   1622.00
 DOWNSTREAM ELEVATION(FEET) =   1598.00
 ELEVATION DIFFERENCE(FEET) =     24.00
 TC = 0.303*[(  290.00**3)/(    24.00)]**.2 =    4.819
 COMPUTED TIME OF CONCENTRATION INCREASED TO 5 MIN.
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.669
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8835
 SOIL CLASSIFICATION IS "C"
 SUBAREA RUNOFF(CFS) =      4.01
 TOTAL AREA(ACRES) =      1.70   TOTAL RUNOFF(CFS) =      4.01

****************************************************************************
 FLOW PROCESS FROM NODE    826.00 TO NODE    827.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0100
 FLOW LENGTH(FEET) =   660.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.32
 ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       4.01
 PIPE TRAVEL TIME(MIN.) =   2.07    Tc(MIN.) =    7.07
 LONGEST FLOWPATH FROM NODE    825.00 TO NODE    827.00 =     950.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    827.00 TO NODE    827.00 IS CODE =   1
----------------------------------------------------------------------------
```



```
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =    7.07
 RAINFALL INTENSITY(INCH/HR) =   2.25
 TOTAL STREAM AREA(ACRES) =     1.70
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.01

****************************************************************************
 FLOW PROCESS FROM NODE    828.00 TO NODE    827.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
       ASSUMED INITIAL SUBAREA UNIFORM
       DEVELOPMENT IS COMMERCIAL
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   480.00
 UPSTREAM ELEVATION(FEET) =   1605.00
 DOWNSTREAM ELEVATION(FEET) =   1587.00
 ELEVATION DIFFERENCE(FEET) =     18.00
 TC = 0.303*[(  480.00**3)/(    18.00)]**.2 =    6.907
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.277
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8813
 SOIL CLASSIFICATION IS "C"
 SUBAREA RUNOFF(CFS) =      4.01
 TOTAL AREA(ACRES) =      2.00   TOTAL RUNOFF(CFS) =      4.01

****************************************************************************
 FLOW PROCESS FROM NODE    827.00 TO NODE    827.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    6.91
 RAINFALL INTENSITY(INCH/HR) =   2.28
 TOTAL STREAM AREA(ACRES) =     2.00
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.01

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)      (MIN.)   (INCH/HOUR)     (ACRE)
    1         4.01      7.07        2.252          1.70
    2         4.01      6.91        2.277          2.00

 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         7.93      6.91       2.277
    2         7.98      7.07       2.252

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       7.98   Tc(MIN.) =    7.07
```

```
 TOTAL AREA(ACRES) =        3.7
 LONGEST FLOWPATH FROM NODE    825.00 TO NODE    827.00 =     950.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    827.00 TO NODE    829.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0200
 FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  15.0 INCH PIPE IS  11.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.01
 ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       7.98
 PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =    7.27
 LONGEST FLOWPATH FROM NODE    825.00 TO NODE    829.00 =    1050.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    829.00 TO NODE    829.00 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.) =    7.27
 RAINFALL INTENSITY(INCH/HR) =   2.22
 TOTAL STREAM AREA(ACRES) =     3.70
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.98

****************************************************************************
 FLOW PROCESS FROM NODE    830.00 TO NODE    829.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS COMMERCIAL
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   640.00
 UPSTREAM ELEVATION(FEET) =   1614.00
 DOWNSTREAM ELEVATION(FEET) =   1592.00
 ELEVATION DIFFERENCE(FEET) =     22.00
 TC = 0.303*[(  640.00**3)/(    22.00)]**.2 =    7.885
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.134
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8803
 SOIL CLASSIFICATION IS "C"
 SUBAREA RUNOFF(CFS) =      2.63
 TOTAL AREA(ACRES) =      1.40   TOTAL RUNOFF(CFS) =      2.63

****************************************************************************
 FLOW PROCESS FROM NODE    829.00 TO NODE    829.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    7.89
```



```
 RAINFALL INTENSITY(INCH/HR) =   2.13
 TOTAL STREAM AREA(ACRES) =     1.40
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.63

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)      (MIN.)   (INCH/HOUR)    (ACRE)
    1         7.93      7.11        2.244          3.70
    1         7.98      7.27        2.220          3.70
    2         2.63      7.89        2.134          1.40

 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        10.30     7.11       2.244
    2        10.40     7.27       2.220
    3        10.30     7.89       2.134

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      10.40   Tc(MIN.) =    7.27
 TOTAL AREA(ACRES) =        5.1
 LONGEST FLOWPATH FROM NODE    825.00 TO NODE    829.00 =    1050.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    829.00 TO NODE    824.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0200
 FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   8.72
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      10.40
 PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =    7.35
 LONGEST FLOWPATH FROM NODE    825.00 TO NODE    824.00 =    1090.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    824.00 TO NODE    824.00 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.) =    7.35
 RAINFALL INTENSITY(INCH/HR) =   2.21
 TOTAL STREAM AREA(ACRES) =     5.10
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.40

****************************************************************************
 FLOW PROCESS FROM NODE    830.00 TO NODE    831.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
```

```
       ASSUMED INITIAL SUBAREA UNIFORM
       DEVELOPMENT IS COMMERCIAL
TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
INITIAL SUBAREA FLOW-LENGTH(FEET) =   640.00
UPSTREAM ELEVATION(FEET) =   1614.00
DOWNSTREAM ELEVATION(FEET) =   1592.00
ELEVATION DIFFERENCE(FEET) =     22.00
TC = 0.303*[(  640.00**3)/(    22.00)]**.2 =    7.885
  10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.134
COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8803
SOIL CLASSIFICATION IS "C"
SUBAREA RUNOFF(CFS) =      3.01
TOTAL AREA(ACRES) =      1.60   TOTAL RUNOFF(CFS) =      3.01

****************************************************************************
  FLOW PROCESS FROM NODE    831.00 TO NODE    824.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.44
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.01
  PIPE TRAVEL TIME(MIN.) =   0.10     Tc(MIN.) =    7.99
  LONGEST FLOWPATH FROM NODE    830.00 TO NODE    824.00 =     680.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    824.00 TO NODE    824.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.99
  RAINFALL INTENSITY(INCH/HR) =   2.12
  TOTAL STREAM AREA(ACRES) =     1.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.01

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       10.30     7.19        2.232         5.10
      1       10.40     7.35        2.208         5.10
      1       10.30     7.96        2.124         5.10
      2        3.01     7.99        2.120         1.60

  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       13.01     7.19       2.232
      2       13.17     7.35       2.208
```



```
      3       13.29     7.96       2.124
      4       13.29     7.99       2.120

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      13.29   Tc(MIN.) =    7.96
  TOTAL AREA(ACRES) =        6.7
  LONGEST FLOWPATH FROM NODE    825.00 TO NODE    824.00 =    1090.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    824.00 TO NODE    824.00 IS CODE =  11
----------------------------------------------------------------------------
  >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

  ** MAIN STREAM CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY     AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
      1       13.01     7.19       2.232         6.70
      2       13.17     7.35       2.208         6.70
      3       13.29     7.96       2.124         6.70
      4       13.29     7.99       2.120         6.70
  LONGEST FLOWPATH FROM NODE    825.00 TO NODE    824.00 =    1090.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY     AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
      1       21.75     6.75       2.303        56.20
      2       34.05    10.26       1.875        56.20
      3       36.16    11.01       1.811        56.20
      4       39.68    12.77       1.684        56.20
      5       40.32    13.38       1.646        56.20
      6       52.68    18.63       1.399        56.20
      7       52.59    18.78       1.393        56.20
      8       53.00    20.95       1.321        56.20
  LONGEST FLOWPATH FROM NODE    800.00 TO NODE    824.00 =    4070.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      33.96      6.75       2.303
      2      36.89      7.19       2.232
      3      37.58      7.35       2.208
      4      39.73      7.96       2.124
      5      39.81      7.99       2.120
      6      45.80     10.26       1.875
      7      47.52     11.01       1.811
      8      50.23     12.77       1.684
      9      50.63     13.38       1.646
     10      61.44     18.63       1.399
     11      61.32     18.78       1.393
     12      61.28     20.95       1.321

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      61.44   Tc(MIN.) =   18.63
  TOTAL AREA(ACRES) =       62.9

****************************************************************************
  FLOW PROCESS FROM NODE    824.00 TO NODE    824.00 IS CODE =  12
```

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

****************************************************************************
  FLOW PROCESS FROM NODE    824.00 TO NODE    832.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =    90.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  23.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.45
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      61.44
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =   18.74
  LONGEST FLOWPATH FROM NODE    800.00 TO NODE    832.00 =    4160.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    832.00 TO NODE    832.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    833.00 TO NODE    834.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   440.00
  UPSTREAM ELEVATION(FEET) =   1622.00
  DOWNSTREAM ELEVATION(FEET) =   1617.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  TC = 0.303*[(  440.00**3)/(     5.00)]**.2 =    8.470
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.060
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8797
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      5.80
  TOTAL AREA(ACRES) =      3.20   TOTAL RUNOFF(CFS) =      5.80

****************************************************************************
  FLOW PROCESS FROM NODE    834.00 TO NODE    835.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =   830.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS  11.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.68
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.80
  PIPE TRAVEL TIME(MIN.) =   2.44    Tc(MIN.) =   10.90
  LONGEST FLOWPATH FROM NODE    833.00 TO NODE    835.00 =    1270.00 FEET.
```



```
****************************************************************************
  FLOW PROCESS FROM NODE    835.00 TO NODE    835.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.90
  RAINFALL INTENSITY(INCH/HR) =   1.82
  TOTAL STREAM AREA(ACRES) =     3.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.80

****************************************************************************
  FLOW PROCESS FROM NODE    833.00 TO NODE    835.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   470.00
  UPSTREAM ELEVATION(FEET) =   1622.00
  DOWNSTREAM ELEVATION(FEET) =   1617.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  TC = 0.303*[(  470.00**3)/(     5.00)]**.2 =    8.812
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.020
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8794
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      1.60
  TOTAL AREA(ACRES) =      0.90   TOTAL RUNOFF(CFS) =      1.60

****************************************************************************
  FLOW PROCESS FROM NODE    835.00 TO NODE    835.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.81
  RAINFALL INTENSITY(INCH/HR) =   2.02
  TOTAL STREAM AREA(ACRES) =     0.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.60

****************************************************************************
  FLOW PROCESS FROM NODE    836.00 TO NODE    837.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   350.00
  UPSTREAM ELEVATION(FEET) =   1620.00
  DOWNSTREAM ELEVATION(FEET) =   1615.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  TC = 0.303*[(  350.00**3)/(     5.00)]**.2 =    7.383
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.204
```

```
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8808
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      3.49
  TOTAL AREA(ACRES) =      1.80   TOTAL RUNOFF(CFS) =      3.49

****************************************************************************
  FLOW PROCESS FROM NODE    837.00 TO NODE    835.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =   400.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.16
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      3.49
  PIPE TRAVEL TIME(MIN.) =   1.29    Tc(MIN.) =    8.68
  LONGEST FLOWPATH FROM NODE    836.00 TO NODE    835.00 =     750.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    835.00 TO NODE    835.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.68
  RAINFALL INTENSITY(INCH/HR) =   2.04
  TOTAL STREAM AREA(ACRES) =     1.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.49

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        5.80    10.90        1.820          3.20
     2        1.60     8.81        2.020          0.90
     3        3.49     8.68        2.036          1.80

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF       Tc      INTENSITY
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)
     1        9.68     8.68       2.036
     2        9.75     8.81       2.020
     3       10.36    10.90       1.820

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      10.36   Tc(MIN.) =   10.90
  TOTAL AREA(ACRES) =         5.9
  LONGEST FLOWPATH FROM NODE    833.00 TO NODE    835.00 =    1270.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    835.00 TO NODE    838.00 IS CODE =  31
----------------------------------------------------------------------------
```



```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =    70.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.72
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     10.36
  PIPE TRAVEL TIME(MIN.) =   0.13    Tc(MIN.) =   11.04
  LONGEST FLOWPATH FROM NODE    833.00 TO NODE    838.00 =    1340.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    838.00 TO NODE    838.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   11.04
  RAINFALL INTENSITY(INCH/HR) =   1.81
  TOTAL STREAM AREA(ACRES) =     5.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.36

****************************************************************************
  FLOW PROCESS FROM NODE    839.00 TO NODE    838.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   710.00
  UPSTREAM ELEVATION(FEET) =  1628.00
  DOWNSTREAM ELEVATION(FEET) =  1597.00
  ELEVATION DIFFERENCE(FEET) =     31.00
  TC = 0.303*[(  710.00**3)/(    31.00)]**.2 =    7.836
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.140
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8803
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      1.70
  TOTAL AREA(ACRES) =      0.90   TOTAL RUNOFF(CFS) =      1.70

****************************************************************************
  FLOW PROCESS FROM NODE    838.00 TO NODE    838.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.84
  RAINFALL INTENSITY(INCH/HR) =   2.14
  TOTAL STREAM AREA(ACRES) =     0.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.70

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

```
 NUMBER      (CFS)      (MIN.)   (INCH/HOUR)    (ACRE)
     1        9.68       8.81       2.020          5.90
     1        9.75       8.95       2.005          5.90
     1       10.36      11.04       1.809          5.90
     2        1.70       7.84       2.140          0.90

 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       10.31     7.84       2.140
     2       11.28     8.81       2.020
     3       11.34     8.95       2.005
     4       11.80    11.04       1.809

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      11.80   Tc(MIN.) =   11.04
 TOTAL AREA(ACRES) =        6.8
 LONGEST FLOWPATH FROM NODE    833.00 TO NODE    838.00 =    1340.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    838.00 TO NODE    840.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0100
 FLOW LENGTH(FEET) =  1100.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.92
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      11.80
 PIPE TRAVEL TIME(MIN.) =   2.65    Tc(MIN.) =   13.69
 LONGEST FLOWPATH FROM NODE    833.00 TO NODE    840.00 =    2440.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    840.00 TO NODE    840.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE    834.00 TO NODE    841.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
       ASSUMED INITIAL SUBAREA UNIFORM
       DEVELOPMENT IS COMMERCIAL
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   400.00
 UPSTREAM ELEVATION(FEET) =   1617.00
 DOWNSTREAM ELEVATION(FEET) =   1615.00
 ELEVATION DIFFERENCE(FEET) =      2.00
 TC = 0.303*[(  400.00**3)/(     2.00)]**.2 =    9.608
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.936
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8787
```



```
 SOIL CLASSIFICATION IS "C"
 SUBAREA RUNOFF(CFS) =      6.47
 TOTAL AREA(ACRES) =      3.80   TOTAL RUNOFF(CFS) =      6.47

****************************************************************************
 FLOW PROCESS FROM NODE    841.00 TO NODE    842.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0100
 FLOW LENGTH(FEET) =   160.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.00
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       6.47
 PIPE TRAVEL TIME(MIN.) =   0.44    Tc(MIN.) =   10.05
 LONGEST FLOWPATH FROM NODE    834.00 TO NODE    842.00 =     560.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    842.00 TO NODE    842.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   10.05
 RAINFALL INTENSITY(INCH/HR) =   1.89
 TOTAL STREAM AREA(ACRES) =     3.80
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.47

****************************************************************************
 FLOW PROCESS FROM NODE    843.00 TO NODE    844.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
       ASSUMED INITIAL SUBAREA UNIFORM
       DEVELOPMENT IS COMMERCIAL
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   730.00
 UPSTREAM ELEVATION(FEET) =   1635.00
 DOWNSTREAM ELEVATION(FEET) =   1618.00
 ELEVATION DIFFERENCE(FEET) =     17.00
 TC = 0.303*[(  730.00**3)/(    17.00)]**.2 =    8.984
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.001
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8793
 SOIL CLASSIFICATION IS "C"
 SUBAREA RUNOFF(CFS) =      1.94
 TOTAL AREA(ACRES) =      1.10   TOTAL RUNOFF(CFS) =      1.94

****************************************************************************
 FLOW PROCESS FROM NODE    844.00 TO NODE    842.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0200
 FLOW LENGTH(FEET) =   120.00   MANNING'S N =  0.013
```

```
 DEPTH OF FLOW IN    9.0 INCH PIPE IS   6.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.65
 ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.94
 PIPE TRAVEL TIME(MIN.) =   0.35    Tc(MIN.) =    9.34
 LONGEST FLOWPATH FROM NODE    843.00 TO NODE    842.00 =     850.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    842.00 TO NODE    842.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.34
 RAINFALL INTENSITY(INCH/HR) =   1.96
 TOTAL STREAM AREA(ACRES) =     1.10
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.94

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        6.47    10.05        1.894          3.80
     2        1.94     9.34        1.964          1.10

 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        7.94     9.34       1.964
     2        8.33    10.05       1.894

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =       8.33   Tc(MIN.) =   10.05
 TOTAL AREA(ACRES) =        4.9
 LONGEST FLOWPATH FROM NODE    843.00 TO NODE    842.00 =     850.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    842.00 TO NODE    845.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0100
 FLOW LENGTH(FEET) =   220.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.31
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       8.33
 PIPE TRAVEL TIME(MIN.) =   0.58    Tc(MIN.) =   10.63
 LONGEST FLOWPATH FROM NODE    843.00 TO NODE    845.00 =    1070.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    845.00 TO NODE    845.00 IS CODE =   1
----------------------------------------------------------------------------
```



```
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   10.63
 RAINFALL INTENSITY(INCH/HR) =   1.84
 TOTAL STREAM AREA(ACRES) =     4.90
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.33

****************************************************************************
 FLOW PROCESS FROM NODE    846.00 TO NODE    847.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS COMMERCIAL
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   240.00
 UPSTREAM ELEVATION(FEET) =   1650.00
 DOWNSTREAM ELEVATION(FEET) =   1615.00
 ELEVATION DIFFERENCE(FEET) =     35.00
 TC = 0.303*[(  240.00**3)/(    35.00)]**.2 =    3.989
 COMPUTED TIME OF CONCENTRATION INCREASED TO 5 MIN.
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.669
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8835
 SOIL CLASSIFICATION IS "C"
 SUBAREA RUNOFF(CFS) =      1.41
 TOTAL AREA(ACRES) =      0.60   TOTAL RUNOFF(CFS) =      1.41

****************************************************************************
 FLOW PROCESS FROM NODE    847.00 TO NODE    845.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0200
 FLOW LENGTH(FEET) =   260.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN    9.0 INCH PIPE IS   5.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.31
 ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.41
 PIPE TRAVEL TIME(MIN.) =   0.82    Tc(MIN.) =    5.82
 LONGEST FLOWPATH FROM NODE    846.00 TO NODE    845.00 =     500.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    845.00 TO NODE    845.00 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.) =    5.82
 RAINFALL INTENSITY(INCH/HR) =   2.48
 TOTAL STREAM AREA(ACRES) =     0.60
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.41

 ** CONFLUENCE DATA **
```

```
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        7.94     9.92        1.906         4.90
      1        8.33    10.63        1.842         4.90
      2        1.41     5.82        2.478         0.60

  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        6.07     5.82       2.478
      2        9.03     9.92       1.906
      3        9.39    10.63       1.842

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       9.39   Tc(MIN.) =   10.63
  TOTAL AREA(ACRES) =        5.5
  LONGEST FLOWPATH FROM NODE    843.00 TO NODE    845.00 =    1070.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    845.00 TO NODE    848.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    80.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.41
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.39
  PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =   10.84
  LONGEST FLOWPATH FROM NODE    843.00 TO NODE    848.00 =    1150.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    848.00 TO NODE    848.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.84
  RAINFALL INTENSITY(INCH/HR) =   1.83
  TOTAL STREAM AREA(ACRES) =     5.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.39

****************************************************************************
  FLOW PROCESS FROM NODE    849.00 TO NODE    848.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   400.00
  UPSTREAM ELEVATION(FEET) =   1615.00
```



```
  DOWNSTREAM ELEVATION(FEET) =   1609.00
  ELEVATION DIFFERENCE(FEET) =      6.00
  TC = 0.303*[(  400.00**3)/(     6.00)]**.2 =    7.712
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.157
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8804
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      4.18
  TOTAL AREA(ACRES) =      2.20   TOTAL RUNOFF(CFS) =      4.18

****************************************************************************
  FLOW PROCESS FROM NODE    848.00 TO NODE    848.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.71
  RAINFALL INTENSITY(INCH/HR) =   2.16
  TOTAL STREAM AREA(ACRES) =     2.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.18

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        6.07     6.05        2.430         5.50
      1        9.03    10.13        1.887         5.50
      1        9.39    10.84        1.825         5.50
      2        4.18     7.71        2.157         2.20

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)    (MIN.)   (INCH/HOUR)
      1        9.35     6.05       2.430
      2       11.05     7.71       2.157
      3       12.69    10.13       1.887
      4       12.92    10.84       1.825

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      12.92   Tc(MIN.) =   10.84
  TOTAL AREA(ACRES) =        7.7
  LONGEST FLOWPATH FROM NODE    843.00 TO NODE    848.00 =    1150.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    848.00 TO NODE    850.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =   330.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.02
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      12.92
```

```
 PIPE TRAVEL TIME(MIN.) =   0.78    Tc(MIN.) =   11.62
 LONGEST FLOWPATH FROM NODE    843.00 TO NODE    850.00 =    1480.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    850.00 TO NODE    850.00 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.) =   11.62
 RAINFALL INTENSITY(INCH/HR) =   1.76
 TOTAL STREAM AREA(ACRES) =     7.70
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     12.92

****************************************************************************
 FLOW PROCESS FROM NODE    837.00 TO NODE    850.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS COMMERCIAL
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   670.00
 UPSTREAM ELEVATION(FEET) =   1615.00
 DOWNSTREAM ELEVATION(FEET) =   1611.00
 ELEVATION DIFFERENCE(FEET) =      4.00
 TC = 0.303*[(  670.00**3)/(     4.00)]**.2 =   11.398
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.781
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8773
 SOIL CLASSIFICATION IS "C"
 SUBAREA RUNOFF(CFS) =      5.78
 TOTAL AREA(ACRES) =      3.70   TOTAL RUNOFF(CFS) =      5.78

****************************************************************************
 FLOW PROCESS FROM NODE    850.00 TO NODE    850.00 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.) =   11.40
 RAINFALL INTENSITY(INCH/HR) =   1.78
 TOTAL STREAM AREA(ACRES) =     3.70
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.78

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        9.35     6.91        2.277         7.70
     1       11.05     8.52        2.054         7.70
     1       12.69    10.92        1.819         7.70
     1       12.92    11.62        1.764         7.70
     2        5.78    11.40        1.781         3.70

 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       12.85     6.91        2.277
     2       15.37     8.52        2.054
     3       18.22    10.92        1.819
     4       18.45    11.40        1.781
     5       18.65    11.62        1.764

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      18.65   Tc(MIN.) =   11.62
 TOTAL AREA(ACRES) =       11.4
 LONGEST FLOWPATH FROM NODE    843.00 TO NODE    850.00 =    1480.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    850.00 TO NODE    851.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0200
 FLOW LENGTH(FEET) =    70.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   9.97
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     18.65
 PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =   11.74
 LONGEST FLOWPATH FROM NODE    843.00 TO NODE    851.00 =    1550.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    851.00 TO NODE    851.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.755
 UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6710
 SOIL CLASSIFICATION IS "C"
 SUBAREA AREA(ACRES) =    2.20   SUBAREA RUNOFF(CFS) =    2.59
 TOTAL AREA(ACRES) =       13.6   TOTAL RUNOFF(CFS) =      21.24
 TC(MIN.) =   11.74

****************************************************************************
 FLOW PROCESS FROM NODE    851.00 TO NODE    851.00 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.) =   11.74
 RAINFALL INTENSITY(INCH/HR) =   1.75
 TOTAL STREAM AREA(ACRES) =    13.60
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     21.24

****************************************************************************
 FLOW PROCESS FROM NODE    838.00 TO NODE    851.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
================================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =  1070.00
  UPSTREAM ELEVATION(FEET) =   1597.00
  DOWNSTREAM ELEVATION(FEET) =   1587.00
  ELEVATION DIFFERENCE(FEET) =     10.00
  TC = 0.303*[( 1070.00**3)/(    10.00)]**.2 =   12.567
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.697
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8765
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      2.23
  TOTAL AREA(ACRES) =      1.50   TOTAL RUNOFF(CFS) =      2.23

****************************************************************************
  FLOW PROCESS FROM NODE    851.00 TO NODE    851.00 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.) =   12.57
  RAINFALL INTENSITY(INCH/HR) =   1.70
  TOTAL STREAM AREA(ACRES) =     1.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.23

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       16.38      7.04        2.256        13.60
      1       18.49      8.64        2.040        13.60
      1       20.91     11.03        1.809        13.60
      1       21.07     11.51        1.772        13.60
      1       21.24     11.74        1.755        13.60
      2        2.23     12.57        1.697         1.50

  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       17.63      7.04       2.256
      2       20.03      8.64       2.040
      3       22.87     11.03       1.809
      4       23.12     11.51       1.772
      5       23.32     11.74       1.755
      6       22.77     12.57       1.697

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      23.32   Tc(MIN.) =   11.74
  TOTAL AREA(ACRES) =       15.1
  LONGEST FLOWPATH FROM NODE    843.00 TO NODE    851.00 =    1550.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    851.00 TO NODE    840.00 IS CODE =  31
```



```
--------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
================================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  15.8 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.65
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      23.32
  PIPE TRAVEL TIME(MIN.) =   0.08    Tc(MIN.) =   11.82
  LONGEST FLOWPATH FROM NODE    843.00 TO NODE    840.00 =    1600.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    840.00 TO NODE    840.00 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       17.63      7.12       2.243       15.10
      2       20.03      8.72       2.031       15.10
      3       22.87     11.11       1.803       15.10
      4       23.12     11.59       1.766       15.10
      5       23.32     11.82       1.749       15.10
      6       22.77     12.65       1.692       15.10
  LONGEST FLOWPATH FROM NODE    843.00 TO NODE    840.00 =    1600.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY     AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
      1       10.31     10.56       1.849        6.80
      2       11.28     11.49       1.774        6.80
      3       11.34     11.62       1.764        6.80
      4       11.80     13.69       1.628        6.80
  LONGEST FLOWPATH FROM NODE    833.00 TO NODE    840.00 =    2440.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
      1      24.63      7.12        2.243
      2      28.60      8.72        2.031
      3      32.04     10.56        1.849
      4      33.79     11.11        1.803
      5      34.18     11.49        1.774
      6      34.43     11.59        1.766
      7      34.43     11.62        1.764
      8      34.57     11.82        1.749
      9      33.67     12.65        1.692
     10      33.70     13.69        1.628

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      34.57   Tc(MIN.) =   11.82
  TOTAL AREA(ACRES) =       21.9

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

```
 FLOW PROCESS FROM NODE    840.00 TO NODE    840.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE    840.00 TO NODE    832.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0200
 FLOW LENGTH(FEET) =   140.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  18.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  11.69
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      34.57
 PIPE TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =   12.02
 LONGEST FLOWPATH FROM NODE    833.00 TO NODE    832.00 =    2580.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    832.00 TO NODE    832.00 IS CODE =  11
----------------------------------------------------------------------------
 >>>>>CONFLUENCE MEMORY BANK # 1 WITH THE MAIN-STREAM MEMORY<<<<<
============================================================================

 ** MAIN STREAM CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
     1       24.63      7.34       2.210       21.90
     2       28.60      8.93       2.007       21.90
     3       32.04     10.76       1.832       21.90
     4       33.79     11.31       1.787       21.90
     5       34.18     11.69       1.759       21.90
     6       34.43     11.79       1.751       21.90
     7       34.43     11.82       1.749       21.90
     8       34.57     12.02       1.735       21.90
     9       33.67     12.85       1.679       21.90
    10       33.70     13.89       1.616       21.90
 LONGEST FLOWPATH FROM NODE    833.00 TO NODE    832.00 =    2580.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
     1       33.96      6.88       2.282       62.90
     2       36.89      7.32       2.213       62.90
     3       37.58      7.48       2.190       62.90
     4       39.73      8.09       2.107       62.90
     5       39.81      8.11       2.104       62.90
     6       45.80     10.38       1.865       62.90
     7       47.52     11.13       1.802       62.90
     8       50.23     12.89       1.676       62.90
     9       50.63     13.50       1.638       62.90
    10       61.44     18.74       1.395       62.90
    11       61.32     18.89       1.389       62.90
    12       61.28     21.06       1.317       62.90
 LONGEST FLOWPATH FROM NODE    800.00 TO NODE    832.00 =    4160.00 FEET.
```



```
 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)
     1       57.04      6.88       2.282
     2       61.45      7.32       2.213
     3       61.50      7.34       2.210
     4       61.97      7.48       2.190
     5       65.61      8.09       2.107
     6       65.78      8.11       2.104
     7       68.04      8.93       2.007
     8       76.79     10.38       1.865
     9       78.00     10.76       1.832
    10       80.74     11.13       1.802
    11       80.92     11.31       1.787
    12       80.57     11.69       1.759
    13       80.61     11.79       1.751
    14       80.57     11.82       1.749
    15       81.40     12.02       1.735
    16       83.73     12.85       1.679
    17       83.84     12.89       1.676
    18       83.49     13.50       1.638
    19       83.63     13.89       1.616
    20       90.53     18.74       1.395
    21       90.30     18.89       1.389
    22       88.75     21.06       1.317

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      90.53   Tc(MIN.) =   18.74
 TOTAL AREA(ACRES) =       84.8

****************************************************************************
 FLOW PROCESS FROM NODE    832.00 TO NODE    832.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE    832.00 TO NODE    852.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0360
 FLOW LENGTH(FEET) =   700.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  33.0 INCH PIPE IS  25.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  18.24
 ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      90.53
 PIPE TRAVEL TIME(MIN.) =   0.64    Tc(MIN.) =   19.38
 LONGEST FLOWPATH FROM NODE    800.00 TO NODE    852.00 =    4860.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =       84.8  TC(MIN.) =     19.38
 PEAK FLOW RATE(CFS)   =      90.53
 *** PEAK FLOW RATE TABLE ***
        Q(CFS)   Tc(MIN.)
 1       57.04       7.58
 2       61.45       8.01
```

3	61.50	8.03
4	61.97	8.17
5	65.61	8.77
6	65.78	8.80
7	68.04	9.62
8	76.79	11.03
9	78.00	11.41
10	80.74	11.77
11	80.92	11.96
12	80.57	12.33
13	80.61	12.44
14	80.57	12.47
15	81.40	12.67
16	83.73	13.49
17	83.84	13.53
18	83.49	14.15
19	83.63	14.53
20	90.53	19.38
21	90.30	19.53
22	88.75	21.70

===
===

END OF RATIONAL METHOD ANALYSIS

```
****************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
      RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                 (RCFC&WCD)  1978 HYDROLOGY MANUAL
        (c) Copyright 1982-2013 Advanced Engineering Software (aes)
                 (Rational Tabling Version 20.0)
               Release Date: 06/01/2013  License ID 1264

                       Analysis prepared by:




 ************************** DESCRIPTION OF STUDY **************************
* MEAD VALLEY BUSINESS PARK                                                 *
* PRELIMINARY PROPOSED CONDITION RATIONAL METHOD HYDROLOGY                  *
* 10 YEAR STORM EVENT FOR AREA TRIBUTARY TO LATERAL B-9AA                   *
 **************************************************************************

  FILE NAME: P10_B9AA.DAT
  TIME/DATE OF STUDY: 13:32 07/03/2019
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =   10.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  1.880
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.780
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.690
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.120
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.4909883
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.4890234
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =   10.00   1-HOUR INTENSITY(INCH/HOUR) =   0.788
  SLOPE OF INTENSITY DURATION CURVE = 0.4910
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:  CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

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

****************************************************************************
  FLOW PROCESS FROM NODE    900.00 TO NODE    901.00 IS CODE =  21
```



```
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =  1140.00
  UPSTREAM ELEVATION(FEET) =   1592.00
  DOWNSTREAM ELEVATION(FEET) =   1567.00
  ELEVATION DIFFERENCE(FEET) =     25.00
  TC = 0.303*[( 1140.00**3)/(    25.00)]**.2 =   10.868
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.823
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8777
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      3.20
  TOTAL AREA(ACRES) =      2.00   TOTAL RUNOFF(CFS) =      3.20

****************************************************************************
  FLOW PROCESS FROM NODE    901.00 TO NODE    901.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.823
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6774
  SOIL CLASSIFICATION IS "C"
  SUBAREA AREA(ACRES) =    1.70   SUBAREA RUNOFF(CFS) =    2.10
  TOTAL AREA(ACRES) =       3.7   TOTAL RUNOFF(CFS) =       5.30
  TC(MIN.) =   10.87

****************************************************************************
  FLOW PROCESS FROM NODE    901.00 TO NODE    902.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0150
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   9.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.63
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.30
  PIPE TRAVEL TIME(MIN.) =   0.25    Tc(MIN.) =   11.12
  LONGEST FLOWPATH FROM NODE    900.00 TO NODE    902.00 =    1240.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    902.00 TO NODE    902.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    903.00 TO NODE    904.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
```

```
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   190.00
  UPSTREAM ELEVATION(FEET) =   1598.00
  DOWNSTREAM ELEVATION(FEET) =   1597.00
  ELEVATION DIFFERENCE(FEET) =      1.00
  TC = 0.303*[(  190.00**3)/(     1.00)]**.2 =    7.061
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.253
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8811
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      3.37
  TOTAL AREA(ACRES) =      1.70   TOTAL RUNOFF(CFS) =      3.37

****************************************************************************
  FLOW PROCESS FROM NODE    904.00 TO NODE    905.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0060
  FLOW LENGTH(FEET) =   370.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   9.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   4.20
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       3.37
  PIPE TRAVEL TIME(MIN.) =   1.47    Tc(MIN.) =    8.53
  LONGEST FLOWPATH FROM NODE    903.00 TO NODE    905.00 =     560.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    905.00 TO NODE    905.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.53
  RAINFALL INTENSITY(INCH/HR) =   2.05
  TOTAL STREAM AREA(ACRES) =    1.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.37

****************************************************************************
  FLOW PROCESS FROM NODE    904.00 TO NODE    905.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   370.00
  UPSTREAM ELEVATION(FEET) =   1597.00
  DOWNSTREAM ELEVATION(FEET) =   1595.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  TC = 0.303*[(  370.00**3)/(     2.00)]**.2 =    9.169
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.981
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8791
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      5.05
  TOTAL AREA(ACRES) =      2.90   TOTAL RUNOFF(CFS) =      5.05

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



```
  FLOW PROCESS FROM NODE    905.00 TO NODE    905.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.17
  RAINFALL INTENSITY(INCH/HR) =   1.98
  TOTAL STREAM AREA(ACRES) =    2.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.05

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        3.37     8.53        2.053         1.70
     2        5.05     9.17        1.981         2.90

  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        8.07     8.53       2.053
     2        8.31     9.17       1.981

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      8.31   Tc(MIN.) =    9.17
  TOTAL AREA(ACRES) =       4.6
  LONGEST FLOWPATH FROM NODE    903.00 TO NODE    905.00 =     560.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    905.00 TO NODE    906.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =   160.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.31
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.31
  PIPE TRAVEL TIME(MIN.) =   0.42    Tc(MIN.) =    9.59
  LONGEST FLOWPATH FROM NODE    903.00 TO NODE    906.00 =     720.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    906.00 TO NODE    906.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.59
  RAINFALL INTENSITY(INCH/HR) =   1.94
  TOTAL STREAM AREA(ACRES) =    4.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.31
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    907.00 TO NODE    908.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =  1030.00
  UPSTREAM ELEVATION(FEET) =   1646.00
  DOWNSTREAM ELEVATION(FEET) =   1596.00
  ELEVATION DIFFERENCE(FEET) =     50.00
  TC = 0.303*[( 1030.00**3)/(    50.00)]**.2 =    8.902
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.010
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8793
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      2.47
  TOTAL AREA(ACRES) =      1.40   TOTAL RUNOFF(CFS) =      2.47

****************************************************************************
  FLOW PROCESS FROM NODE    908.00 TO NODE    906.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.14
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      2.47
  PIPE TRAVEL TIME(MIN.) =   0.27    Tc(MIN.) =    9.17
  LONGEST FLOWPATH FROM NODE    907.00 TO NODE    906.00 =    1130.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    906.00 TO NODE    906.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.17
  RAINFALL INTENSITY(INCH/HR) =   1.98
  TOTAL STREAM AREA(ACRES) =     1.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.47

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        8.07     8.96        2.005          4.60
      1        8.31     9.59        1.938          4.60
      2        2.47     9.17        1.981          1.40

  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       10.49     8.96       2.005
      2       10.45     9.17       1.981
      3       10.73     9.59       1.938

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      10.73   Tc(MIN.) =    9.59
  TOTAL AREA(ACRES) =         6.0
  LONGEST FLOWPATH FROM NODE    907.00 TO NODE    906.00 =    1130.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    906.00 TO NODE    909.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.79
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     10.73
  PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =    9.71
  LONGEST FLOWPATH FROM NODE    907.00 TO NODE    909.00 =    1180.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    909.00 TO NODE    909.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.71
  RAINFALL INTENSITY(INCH/HR) =   1.93
  TOTAL STREAM AREA(ACRES) =     6.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.73

****************************************************************************
  FLOW PROCESS FROM NODE    910.00 TO NODE    909.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   250.00
  UPSTREAM ELEVATION(FEET) =   1597.00
  DOWNSTREAM ELEVATION(FEET) =   1591.00
  ELEVATION DIFFERENCE(FEET) =      6.00
  TC = 0.303*[(  250.00**3)/(     6.00)]**.2 =    5.817
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.477
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8825
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      4.37
  TOTAL AREA(ACRES) =      2.00   TOTAL RUNOFF(CFS) =      4.37
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    909.00 TO NODE    909.00 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.) =    5.82
  RAINFALL INTENSITY(INCH/HR) =   2.48
  TOTAL STREAM AREA(ACRES) =     2.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.37

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       10.49     9.08        1.991         6.00
      1       10.45     9.30        1.968         6.00
      1       10.73     9.71        1.926         6.00
      2        4.37     5.82        2.477         2.00

  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       11.09     5.82       2.477
      2       14.00     9.08       1.991
      3       13.93     9.30       1.968
      4       14.13     9.71       1.926

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      14.13   Tc(MIN.) =    9.71
  TOTAL AREA(ACRES) =        8.0
  LONGEST FLOWPATH FROM NODE    907.00 TO NODE    909.00 =    1180.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    909.00 TO NODE    911.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =   430.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  16.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.10
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      14.13
  PIPE TRAVEL TIME(MIN.) =   1.01    Tc(MIN.) =   10.72
  LONGEST FLOWPATH FROM NODE    907.00 TO NODE    911.00 =    1610.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    911.00 TO NODE    911.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
```



```
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.72
  RAINFALL INTENSITY(INCH/HR) =   1.83
  TOTAL STREAM AREA(ACRES) =     8.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     14.13

****************************************************************************
  FLOW PROCESS FROM NODE    912.00 TO NODE    911.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
       ASSUMED INITIAL SUBAREA UNIFORM
       DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   820.00
  UPSTREAM ELEVATION(FEET) =   1597.00
  DOWNSTREAM ELEVATION(FEET) =   1592.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  TC = 0.303*[(  820.00**3)/(     5.00)]**.2 =   12.305
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.715
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8767
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      6.31
  TOTAL AREA(ACRES) =      4.20   TOTAL RUNOFF(CFS) =      6.31

****************************************************************************
  FLOW PROCESS FROM NODE    911.00 TO NODE    911.00 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.) =   12.30
  RAINFALL INTENSITY(INCH/HR) =   1.71
  TOTAL STREAM AREA(ACRES) =     4.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.31

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       11.09     6.87        2.284         8.00
      1       14.00    10.09        1.891         8.00
      1       13.93    10.31        1.871         8.00
      1       14.13    10.72        1.835         8.00
      2        6.31    12.30        1.715         4.20

  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       14.62     6.87       2.284
      2       19.18    10.09       1.891
      3       19.22    10.31       1.871
      4       19.63    10.72       1.835
      5       19.52    12.30       1.715
```

```
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      19.63   Tc(MIN.) =   10.72
 TOTAL AREA(ACRES) =       12.2
 LONGEST FLOWPATH FROM NODE    907.00 TO NODE    911.00 =    1610.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    911.00 TO NODE    902.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0200
 FLOW LENGTH(FEET) =   130.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  10.03
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      19.63
 PIPE TRAVEL TIME(MIN.) =   0.22    Tc(MIN.) =   10.94
 LONGEST FLOWPATH FROM NODE    907.00 TO NODE    902.00 =    1740.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    902.00 TO NODE    902.00 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       14.62     7.09       2.248       12.20
     2       19.18    10.30       1.871       12.20
     3       19.22    10.52       1.852       12.20
     4       19.63    10.94       1.817       12.20
     5       19.52    12.52       1.700       12.20
 LONGEST FLOWPATH FROM NODE    907.00 TO NODE    902.00 =    1740.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1        5.30    11.12       1.802        3.70
 LONGEST FLOWPATH FROM NODE    900.00 TO NODE    902.00 =    1240.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc      INTENSITY
 NUMBER     (CFS)      (MIN.)   (INCH/HOUR)
     1      18.00       7.09        2.248
     2      24.09      10.30        1.871
     3      24.23      10.52        1.852
     4      24.84      10.94        1.817
     5      24.77      11.12        1.802
     6      24.52      12.52        1.700

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      24.84   Tc(MIN.) =   10.94
 TOTAL AREA(ACRES) =       15.9

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



```
 FLOW PROCESS FROM NODE    902.00 TO NODE    913.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0150
 FLOW LENGTH(FEET) =   130.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  18.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   9.52
 ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      24.84
 PIPE TRAVEL TIME(MIN.) =   0.23    Tc(MIN.) =   11.17
 LONGEST FLOWPATH FROM NODE    907.00 TO NODE    913.00 =    1870.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    913.00 TO NODE    913.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE    914.00 TO NODE    915.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   640.00
 UPSTREAM ELEVATION(FEET) =   1654.00
 DOWNSTREAM ELEVATION(FEET) =   1603.00
 ELEVATION DIFFERENCE(FEET) =     51.00
 TC = 0.533*[(  640.00**3)/(    51.00)]**.2 =   11.711
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  1.757
 UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6712
 SOIL CLASSIFICATION IS "C"
 SUBAREA RUNOFF(CFS) =      3.30
 TOTAL AREA(ACRES) =      2.80   TOTAL RUNOFF(CFS) =      3.30

****************************************************************************
 FLOW PROCESS FROM NODE    915.00 TO NODE    916.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0500
 FLOW LENGTH(FEET) =   640.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN   9.0 INCH PIPE IS   6.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   9.03
 ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       3.30
 PIPE TRAVEL TIME(MIN.) =   1.18    Tc(MIN.) =   12.89
 LONGEST FLOWPATH FROM NODE    914.00 TO NODE    916.00 =    1280.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    916.00 TO NODE    916.00 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.) =   12.89
  RAINFALL INTENSITY(INCH/HR) =   1.68
  TOTAL STREAM AREA(ACRES) =     2.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.30

****************************************************************************
  FLOW PROCESS FROM NODE    917.00 TO NODE    918.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   840.00
  UPSTREAM ELEVATION(FEET) =   1606.00
  DOWNSTREAM ELEVATION(FEET) =   1567.00
  ELEVATION DIFFERENCE(FEET) =     39.00
  TC = 0.303*[(  840.00**3)/(    39.00)]**.2 =    8.278
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.083
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8799
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      2.38
  TOTAL AREA(ACRES) =      1.30   TOTAL RUNOFF(CFS) =      2.38

****************************************************************************
  FLOW PROCESS FROM NODE    918.00 TO NODE    918.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
    10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.083
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6990
  SOIL CLASSIFICATION IS "C"
  SUBAREA AREA(ACRES) =    0.50   SUBAREA RUNOFF(CFS) =    0.73
  TOTAL AREA(ACRES) =        1.8   TOTAL RUNOFF(CFS) =       3.11
  TC(MIN.) =    8.28

****************************************************************************
  FLOW PROCESS FROM NODE    918.00 TO NODE    916.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =   130.00   MANNING'S N =  0.013
  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.) =   0.33    Tc(MIN.) =    8.61
  LONGEST FLOWPATH FROM NODE     917.00 TO NODE    916.00 =     970.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    916.00 TO NODE    916.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```



```
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.61
  RAINFALL INTENSITY(INCH/HR) =   2.04
  TOTAL STREAM AREA(ACRES) =     1.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.11

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1         3.30    12.89        1.676          2.80
     2         3.11     8.61        2.043          1.80

  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         5.32     8.61       2.043
     2         5.85    12.89       1.676

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       5.85   Tc(MIN.) =   12.89
  TOTAL AREA(ACRES) =        4.6
  LONGEST FLOWPATH FROM NODE    914.00 TO NODE    916.00 =    1280.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    916.00 TO NODE    913.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0150
  FLOW LENGTH(FEET) =   130.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS  10.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.76
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.85
  PIPE TRAVEL TIME(MIN.) =   0.32    Tc(MIN.) =   13.21
  LONGEST FLOWPATH FROM NODE    914.00 TO NODE    913.00 =    1410.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    913.00 TO NODE    913.00 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         5.32     8.94       2.006        4.60
     2         5.85    13.21       1.656        4.60
  LONGEST FLOWPATH FROM NODE    914.00 TO NODE    913.00 =    1410.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
```

```
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
     1       18.00      7.34       2.210       15.90
     2       24.09     10.53       1.851       15.90
     3       24.23     10.75       1.832       15.90
     4       24.84     11.17       1.799       15.90
     5       24.77     11.35       1.785       15.90
     6       24.52     12.75       1.685       15.90
 LONGEST FLOWPATH FROM NODE    907.00 TO NODE    913.00 =    1870.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc      INTENSITY
 NUMBER     (CFS)      (MIN.)   (INCH/HOUR)
     1      22.36       7.34       2.210
     2      25.76       8.94       2.006
     3      29.00      10.53       1.851
     4      29.09      10.75       1.832
     5      29.79      11.17       1.799
     6      29.80      11.35       1.785
     7      30.17      12.75       1.685
     8      29.95      13.21       1.656

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      30.17   Tc(MIN.) =   12.75
 TOTAL AREA(ACRES) =       20.5

****************************************************************************
 FLOW PROCESS FROM NODE    913.00 TO NODE    919.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0150
 FLOW LENGTH(FEET) =   170.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  18.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  10.13
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      30.17
 PIPE TRAVEL TIME(MIN.) =   0.28     Tc(MIN.) =   13.03
 LONGEST FLOWPATH FROM NODE    907.00 TO NODE    919.00 =    2040.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    913.00 TO NODE    913.00 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.) =   13.03
 RAINFALL INTENSITY(INCH/HR) =   1.67
 TOTAL STREAM AREA(ACRES) =    20.50
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     30.17

****************************************************************************
 FLOW PROCESS FROM NODE    920.00 TO NODE    921.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
```



```
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS COMMERCIAL
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   900.00
 UPSTREAM ELEVATION(FEET) =   1595.00
 DOWNSTREAM ELEVATION(FEET) =   1562.00
 ELEVATION DIFFERENCE(FEET) =     33.00
 TC = 0.303*[(  900.00**3)/(    33.00)]**.2 =    8.921
   10 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.008
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8793
 SOIL CLASSIFICATION IS "C"
 SUBAREA RUNOFF(CFS) =      1.41
 TOTAL AREA(ACRES) =      0.80   TOTAL RUNOFF(CFS) =      1.41

****************************************************************************
 FLOW PROCESS FROM NODE    921.00 TO NODE    919.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0200
 FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN   9.0 INCH PIPE IS   5.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.33
 ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       1.41
 PIPE TRAVEL TIME(MIN.) =   0.16     Tc(MIN.) =    9.08
 LONGEST FLOWPATH FROM NODE    920.00 TO NODE    919.00 =     950.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    919.00 TO NODE    919.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.08
 RAINFALL INTENSITY(INCH/HR) =   1.99
 TOTAL STREAM AREA(ACRES) =     0.80
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.41

 ** CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       22.36      7.64       2.167        20.50
     1       25.76      9.24       1.974        20.50
     1       29.00     10.81       1.827        20.50
     1       29.09     11.03       1.809        20.50
     1       29.79     11.45       1.777        20.50
     1       29.80     11.63       1.763        20.50
     1       30.17     13.03       1.668        20.50
     1       29.95     13.49       1.639        20.50
     2        1.41      9.08       1.991         0.80

 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       23.55      7.64       2.167
    2       26.73      9.08       1.991
    3       27.16      9.24       1.974
    4       30.29     10.81       1.827
    5       30.37     11.03       1.809
    6       31.05     11.45       1.777
    7       31.05     11.63       1.763
    8       31.35     13.03       1.668
    9       31.11     13.49       1.639

COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
PEAK FLOW RATE(CFS) =      31.35   Tc(MIN.) =   13.03
TOTAL AREA(ACRES) =       21.3
LONGEST FLOWPATH FROM NODE    907.00 TO NODE    919.00 =    2040.00 FEET.
============================================================================
END OF STUDY SUMMARY:
TOTAL AREA(ACRES)      =       21.3  TC(MIN.) =     13.03
PEAK FLOW RATE(CFS)    =      31.35
*** PEAK FLOW RATE TABLE ***
       Q(CFS)   Tc(MIN.)
1       23.55       7.64
2       26.73       9.08
3       27.16       9.24
4       30.29      10.81
5       30.37      11.03
6       31.05      11.45
7       31.05      11.63
8       31.35      13.03
9       31.11      13.49
============================================================================
============================================================================
END OF RATIONAL METHOD ANALYSIS
```

```
****************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
       RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                  (RCFC&WCD)  1978 HYDROLOGY MANUAL
         (c) Copyright 1982-2013 Advanced Engineering Software (aes)
                  (Rational Tabling Version 20.0)
               Release Date: 06/01/2013  License ID 1264

                        Analysis prepared by:



 ************************** DESCRIPTION OF STUDY **************************
* MEAD VALLEY BUSINESS PARK                                                *
* PRELIMINARY PROPOSED CONDITION RATIONAL METHOD HYDROLOGY                 *
* 100 YEAR STORM EVENT FOR AREA TRIBUTARY TO LATERAL B-8                   *
 **************************************************************************

  FILE NAME: P100_B8.DAT
  TIME/DATE OF STUDY: 11:33 07/03/2019
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  1.880
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.780
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.690
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.120
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.4909883
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.4890234
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.120
  SLOPE OF INTENSITY DURATION CURVE = 0.4890
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:  CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP  HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

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

****************************************************************************
  FLOW PROCESS FROM NODE    800.00 TO NODE    801.00 IS CODE =  21
```



```
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   980.00
  UPSTREAM ELEVATION(FEET) =   1715.00
  DOWNSTREAM ELEVATION(FEET) =   1670.00
  ELEVATION DIFFERENCE(FEET) =     45.00
  TC = 0.533*[(  980.00**3)/(    45.00)]**.2 =   15.506
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.171
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7053
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =     16.54
  TOTAL AREA(ACRES) =     10.80   TOTAL RUNOFF(CFS) =     16.54

****************************************************************************
  FLOW PROCESS FROM NODE    801.00 TO NODE    802.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0390
  CHANNEL LENGTH THRU SUBAREA(FEET) =  1230.00
  "V" GUTTER WIDTH(FEET) =    5.00   GUTTER HIKE(FEET) =  0.800
  PAVEMENT LIP(FEET) =  0.400   MANNING'S N = .0300
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =    2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.004
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .6928
  SOIL CLASSIFICATION IS "C"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     23.20
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.42
  AVERAGE FLOW DEPTH(FEET) =   1.20   FLOOD WIDTH(FEET) =     5.00
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   2.76   Tc(MIN.) =   18.27
  SUBAREA AREA(ACRES) =    9.60       SUBAREA RUNOFF(CFS) =   13.33
  TOTAL AREA(ACRES) =       20.4         PEAK FLOW RATE(CFS) =      29.86

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  1.20   FLOOD WIDTH(FEET) =    5.23
  FLOW VELOCITY(FEET/SEC.) =   7.44   DEPTH*VELOCITY(FT*FT/SEC) =   8.95
  LONGEST FLOWPATH FROM NODE    800.00 TO NODE    802.00 =    2210.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    802.00 TO NODE    803.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =   300.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  19.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.01
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      29.86
  PIPE TRAVEL TIME(MIN.) =   0.45    Tc(MIN.) =   18.72
  LONGEST FLOWPATH FROM NODE    800.00 TO NODE    803.00 =    2510.00 FEET.
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    803.00 TO NODE    803.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   18.72
  RAINFALL INTENSITY(INCH/HR) =   1.98
  TOTAL STREAM AREA(ACRES) =    20.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     29.86

****************************************************************************
  FLOW PROCESS FROM NODE    804.00 TO NODE    805.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =  1000.00
  UPSTREAM ELEVATION(FEET) =   1733.00
  DOWNSTREAM ELEVATION(FEET) =   1663.00
  ELEVATION DIFFERENCE(FEET) =     70.00
  TC = 0.533*[( 1000.00**3)/(    70.00)]**.2 =   14.368
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.253
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7110
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =     16.50
  TOTAL AREA(ACRES) =     10.30   TOTAL RUNOFF(CFS) =     16.50

****************************************************************************
  FLOW PROCESS FROM NODE    805.00 TO NODE    806.00 IS CODE =  91
----------------------------------------------------------------------------
  >>>>>COMPUTE "V" GUTTER FLOW TRAVEL TIME THRU SUBAREA<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0400
  CHANNEL LENGTH THRU SUBAREA(FEET) =   850.00
  "V" GUTTER WIDTH(FEET) =   5.00   GUTTER HIKE(FEET) =  0.800
  PAVEMENT LIP(FEET) =  0.400   MANNING'S N = .0300
  PAVEMENT CROSSFALL(DECIMAL NOTATION) = 0.02000
  MAXIMUM DEPTH(FEET) =   2.00
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.121
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7018
  SOIL CLASSIFICATION IS "C"
  TRAVEL TIME COMPUTED USING ESTIMATED FLOW(CFS) =     24.69
  TRAVEL TIME THRU SUBAREA BASED ON VELOCITY(FEET/SEC.) =   7.52
  AVERAGE FLOW DEPTH(FEET) =   1.20   FLOOD WIDTH(FEET) =    5.00
  "V" GUTTER FLOW TRAVEL TIME(MIN.) =   1.88   Tc(MIN.) =   16.25
  SUBAREA AREA(ACRES) =   11.00       SUBAREA RUNOFF(CFS) =   16.38
  TOTAL AREA(ACRES) =       21.3         PEAK FLOW RATE(CFS) =      32.88

  END OF SUBAREA "V" GUTTER HYDRAULICS:
  DEPTH(FEET) =  1.24   FLOOD WIDTH(FEET) =    9.30
  FLOW VELOCITY(FEET/SEC.) =   7.63   DEPTH*VELOCITY(FT*FT/SEC) =   9.49
  LONGEST FLOWPATH FROM NODE    804.00 TO NODE    806.00 =    1850.00 FEET.

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



```
  FLOW PROCESS FROM NODE    806.00 TO NODE    803.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =   120.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  18.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.59
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     32.88
  PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =   16.42
  LONGEST FLOWPATH FROM NODE    804.00 TO NODE    803.00 =    1970.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    803.00 TO NODE    803.00 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.) =   16.42
  RAINFALL INTENSITY(INCH/HR) =   2.11
  TOTAL STREAM AREA(ACRES) =    21.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     32.88

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        29.86    18.72        1.980         20.40
     2        32.88    16.42        2.110         21.30

  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        59.08    16.42       2.110
     2        60.70    18.72       1.980

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      60.70   Tc(MIN.) =   18.72
  TOTAL AREA(ACRES) =       41.7
  LONGEST FLOWPATH FROM NODE    800.00 TO NODE    803.00 =    2510.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    803.00 TO NODE    807.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =   490.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  33.0 INCH PIPE IS  23.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  13.42
  ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
```

```
 PIPE-FLOW(CFS) =      60.70
 PIPE TRAVEL TIME(MIN.) =   0.61    Tc(MIN.) =   19.33
 LONGEST FLOWPATH FROM NODE    800.00 TO NODE    807.00 =    3000.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    807.00 TO NODE    807.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   19.33
 RAINFALL INTENSITY(INCH/HR) =   1.95
 TOTAL STREAM AREA(ACRES) =    41.70
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     60.70

****************************************************************************
 FLOW PROCESS FROM NODE    808.00 TO NODE    809.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   570.00
 UPSTREAM ELEVATION(FEET) =   1704.00
 DOWNSTREAM ELEVATION(FEET) =   1648.00
 ELEVATION DIFFERENCE(FEET) =     56.00
 TC = 0.533*[(  570.00**3)/(    56.00)]**.2 =   10.722
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.600
 UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7315
 SOIL CLASSIFICATION IS "C"
 SUBAREA RUNOFF(CFS) =      3.61
 TOTAL AREA(ACRES) =      1.90   TOTAL RUNOFF(CFS) =      3.61

****************************************************************************
 FLOW PROCESS FROM NODE    809.00 TO NODE    807.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0200
 FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.8 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.69
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       3.61
 PIPE TRAVEL TIME(MIN.) =   0.37    Tc(MIN.) =   11.10
 LONGEST FLOWPATH FROM NODE    808.00 TO NODE    807.00 =     720.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    807.00 TO NODE    807.00 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.) =   11.10
 RAINFALL INTENSITY(INCH/HR) =   2.56
 TOTAL STREAM AREA(ACRES) =     1.90
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.61

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
    1        59.08    17.04        2.073         41.70
    1        60.70    19.33        1.949         41.70
    2         3.61    11.10        2.557          1.90

 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        42.09    11.10       2.557
    2        62.00    17.04       2.073
    3        63.45    19.33       1.949

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      63.45   Tc(MIN.) =   19.33
 TOTAL AREA(ACRES) =       43.6
 LONGEST FLOWPATH FROM NODE    800.00 TO NODE    807.00 =    3000.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    807.00 TO NODE    810.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0100
 FLOW LENGTH(FEET) =   240.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  39.0 INCH PIPE IS  26.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  10.51
 ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      63.45
 PIPE TRAVEL TIME(MIN.) =   0.38    Tc(MIN.) =   19.71
 LONGEST FLOWPATH FROM NODE    800.00 TO NODE    810.00 =    3240.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    810.00 TO NODE    810.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   19.71
 RAINFALL INTENSITY(INCH/HR) =   1.93
 TOTAL STREAM AREA(ACRES) =    43.60
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     63.45

****************************************************************************
 FLOW PROCESS FROM NODE    811.00 TO NODE    812.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
===========================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   720.00
  UPSTREAM ELEVATION(FEET) =   1718.00
  DOWNSTREAM ELEVATION(FEET) =   1649.00
  ELEVATION DIFFERENCE(FEET) =     69.00
  TC = 0.533*[(  720.00**3)/(    69.00)]**.2 =   11.831
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.478
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7248
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      4.13
  TOTAL AREA(ACRES) =      2.30   TOTAL RUNOFF(CFS) =      4.13

****************************************************************************
  FLOW PROCESS FROM NODE    812.00 TO NODE    810.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===========================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   8.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.85
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.13
  PIPE TRAVEL TIME(MIN.) =   0.37    Tc(MIN.) =   12.20
  LONGEST FLOWPATH FROM NODE    811.00 TO NODE    810.00 =     870.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    810.00 TO NODE    810.00 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.) =   12.20
  RAINFALL INTENSITY(INCH/HR) =   2.44
  TOTAL STREAM AREA(ACRES) =     2.30
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.13

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)      (MIN.)   (INCH/HOUR)    (ACRE)
      1       42.09    11.52        2.510        43.60
      1       62.00    17.43        2.050        43.60
      1       63.45    19.71        1.930        43.60
      2        4.13    12.20        2.441         2.30

  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       45.99    11.52       2.510
```



```
      2       47.52    12.20       2.441
      3       65.47    17.43       2.050
      4       66.72    19.71       1.930

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      66.72   Tc(MIN.) =   19.71
  TOTAL AREA(ACRES) =       45.9
  LONGEST FLOWPATH FROM NODE    800.00 TO NODE    810.00 =    3240.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    810.00 TO NODE    813.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===========================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =   320.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  27.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  10.60
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      66.72
  PIPE TRAVEL TIME(MIN.) =   0.50    Tc(MIN.) =   20.21
  LONGEST FLOWPATH FROM NODE    800.00 TO NODE    813.00 =    3560.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    813.00 TO NODE    813.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
===========================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    814.00 TO NODE    815.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
===========================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =  1190.00
  UPSTREAM ELEVATION(FEET) =   1691.00
  DOWNSTREAM ELEVATION(FEET) =   1605.00
  ELEVATION DIFFERENCE(FEET) =     86.00
  TC = 0.533*[( 1190.00**3)/(    86.00)]**.2 =   15.305
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.185
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7063
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      6.17
  TOTAL AREA(ACRES) =      4.00   TOTAL RUNOFF(CFS) =      6.17

****************************************************************************
  FLOW PROCESS FROM NODE    815.00 TO NODE    816.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
===========================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =   670.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   9.4 INCHES
```

```
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.67
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       6.17
  PIPE TRAVEL TIME(MIN.) =   1.46    Tc(MIN.) =   16.76
  LONGEST FLOWPATH FROM NODE    814.00 TO NODE    816.00 =    1860.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    816.00 TO NODE    816.00 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.) =   16.76
  RAINFALL INTENSITY(INCH/HR) =   2.09
  TOTAL STREAM AREA(ACRES) =     4.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.17

****************************************************************************
  FLOW PROCESS FROM NODE    817.00 TO NODE    818.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   460.00
  UPSTREAM ELEVATION(FEET) =   1702.00
  DOWNSTREAM ELEVATION(FEET) =   1620.00
  ELEVATION DIFFERENCE(FEET) =     82.00
  TC = 0.533*[(  460.00**3)/(    82.00)]**.2 =    8.736
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.874
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7448
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      5.14
  TOTAL AREA(ACRES) =      2.40   TOTAL RUNOFF(CFS) =      5.14

****************************************************************************
  FLOW PROCESS FROM NODE    818.00 TO NODE    816.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =   140.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  15.0 INCH PIPE IS   8.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.36
  ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       5.14
  PIPE TRAVEL TIME(MIN.) =   0.32    Tc(MIN.) =    9.05
  LONGEST FLOWPATH FROM NODE    817.00 TO NODE    816.00 =     600.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    816.00 TO NODE    816.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
```



```
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.05
  RAINFALL INTENSITY(INCH/HR) =   2.82
  TOTAL STREAM AREA(ACRES) =     2.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.14

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1         6.17    16.76        2.090          4.00
     2         5.14     9.05        2.824          2.40

  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         8.47     9.05       2.824
     2         9.97    16.76       2.090

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       9.97   Tc(MIN.) =   16.76
  TOTAL AREA(ACRES) =        6.4
  LONGEST FLOWPATH FROM NODE    814.00 TO NODE    816.00 =    1860.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    816.00 TO NODE    819.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =   380.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.2 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.65
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.97
  PIPE TRAVEL TIME(MIN.) =   0.73    Tc(MIN.) =   17.49
  LONGEST FLOWPATH FROM NODE    814.00 TO NODE    819.00 =    2240.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    819.00 TO NODE    819.00 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.) =   17.49
  RAINFALL INTENSITY(INCH/HR) =   2.05
  TOTAL STREAM AREA(ACRES) =     6.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.97

****************************************************************************
  FLOW PROCESS FROM NODE    820.00 TO NODE    821.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
```

```
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   100.00
  UPSTREAM ELEVATION(FEET) =   1690.00
  DOWNSTREAM ELEVATION(FEET) =   1644.00
  ELEVATION DIFFERENCE(FEET) =     46.00
  TC = 0.533*[(  100.00**3)/(    46.00)]**.2 =    3.925
  COMPUTED TIME OF CONCENTRATION INCREASED TO 5 MIN.
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.775
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7768
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      1.17
  TOTAL AREA(ACRES) =      0.40   TOTAL RUNOFF(CFS) =      1.17

****************************************************************************
  FLOW PROCESS FROM NODE    821.00 TO NODE    819.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   4.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.09
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       1.17
  PIPE TRAVEL TIME(MIN.) =   0.49    Tc(MIN.) =    5.49
  LONGEST FLOWPATH FROM NODE    820.00 TO NODE    819.00 =     250.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    819.00 TO NODE    819.00 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.) =    5.49
  RAINFALL INTENSITY(INCH/HR) =   3.61
  TOTAL STREAM AREA(ACRES) =     0.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      1.17

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        8.47     9.84        2.711          6.40
      1        9.97    17.49        2.046          6.40
      2        1.17     5.49        3.606          0.40

  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        5.90     5.49       3.606
```



```
      2        9.35     9.84       2.711
      3       10.64    17.49       2.046

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      10.64   Tc(MIN.) =   17.49
  TOTAL AREA(ACRES) =        6.8
  LONGEST FLOWPATH FROM NODE    814.00 TO NODE    819.00 =    2240.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    819.00 TO NODE    822.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =   150.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.76
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      10.64
  PIPE TRAVEL TIME(MIN.) =   0.29    Tc(MIN.) =   17.78
  LONGEST FLOWPATH FROM NODE    814.00 TO NODE    822.00 =    2390.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    822.00 TO NODE    822.00 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.) =   17.78
  RAINFALL INTENSITY(INCH/HR) =   2.03
  TOTAL STREAM AREA(ACRES) =     6.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     10.64

****************************************************************************
  FLOW PROCESS FROM NODE    814.00 TO NODE    823.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   410.00
  UPSTREAM ELEVATION(FEET) =   1691.00
  DOWNSTREAM ELEVATION(FEET) =   1644.00
  ELEVATION DIFFERENCE(FEET) =     47.00
  TC = 0.533*[(  410.00**3)/(    47.00)]**.2 =    9.113
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.815
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7421
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      7.31
  TOTAL AREA(ACRES) =      3.50   TOTAL RUNOFF(CFS) =      7.31

****************************************************************************
  FLOW PROCESS FROM NODE    823.00 TO NODE    822.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
```

```
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
 REPRESENTATIVE SLOPE =  0.0200
 FLOW LENGTH(FEET) =   170.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  15.0 INCH PIPE IS  10.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.92
 ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       7.31
 PIPE TRAVEL TIME(MIN.) =   0.36    Tc(MIN.) =    9.47
 LONGEST FLOWPATH FROM NODE    814.00 TO NODE    822.00 =     580.00 FEET.

******************************************************************************
 FLOW PROCESS FROM NODE    822.00 TO NODE    822.00 IS CODE =   1
------------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.47
 RAINFALL INTENSITY(INCH/HR) =   2.76
 TOTAL STREAM AREA(ACRES) =     3.50
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.31

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        5.90      5.82        3.505          6.80
     1        9.35     10.13        2.673          6.80
     1       10.64     17.78        2.030          6.80
     2        7.31      9.47        2.763          3.50

 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       10.39     5.82       3.505
     2       16.05     9.47       2.763
     3       16.43    10.13       2.673
     4       16.01    17.78       2.030

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      16.43   Tc(MIN.) =   10.13
 TOTAL AREA(ACRES) =       10.3
 LONGEST FLOWPATH FROM NODE    814.00 TO NODE    822.00 =    2390.00 FEET.

******************************************************************************
 FLOW PROCESS FROM NODE    822.00 TO NODE    813.00 IS CODE =  31
------------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
 REPRESENTATIVE SLOPE =  0.0200
 FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  13.9 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   9.76
```



```
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      16.43
 PIPE TRAVEL TIME(MIN.) =   0.17    Tc(MIN.) =   10.30
 LONGEST FLOWPATH FROM NODE    814.00 TO NODE    813.00 =    2490.00 FEET.

******************************************************************************
 FLOW PROCESS FROM NODE    813.00 TO NODE    813.00 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       10.39     6.01        3.450       10.30
     2       16.05     9.64        2.738       10.30
     3       16.43    10.30        2.651       10.30
     4       16.01    17.95        2.021       10.30
 LONGEST FLOWPATH FROM NODE    814.00 TO NODE    813.00 =    2490.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
     1       45.99    12.08        2.453       45.90
     2       47.52    12.75        2.389       45.90
     3       65.47    17.93        2.022       45.90
     4       66.72    20.21        1.907       45.90
 LONGEST FLOWPATH FROM NODE    800.00 TO NODE    813.00 =    3560.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc      INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1      33.29      6.01        3.450
     2      52.78      9.64        2.738
     3      55.67     10.30        2.651
     4      61.19     12.08        2.453
     5      62.32     12.75        2.389
     6      81.47     17.93        2.022
     7      81.45     17.95        2.021
     8      81.83     20.21        1.907

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      81.83   Tc(MIN.) =   20.21
 TOTAL AREA(ACRES) =       56.2

******************************************************************************
 FLOW PROCESS FROM NODE    813.00 TO NODE    813.00 IS CODE =  12
------------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
==============================================================================

******************************************************************************
 FLOW PROCESS FROM NODE    813.00 TO NODE    824.00 IS CODE =  31
------------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
 REPRESENTATIVE SLOPE =  0.0400
```

```
 FLOW LENGTH(FEET) =   510.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  33.0 INCH PIPE IS  22.6 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  18.83
 ESTIMATED PIPE DIAMETER(INCH) =  33.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      81.83
 PIPE TRAVEL TIME(MIN.) =   0.45    Tc(MIN.) =   20.66
 LONGEST FLOWPATH FROM NODE    800.00 TO NODE    824.00 =    4070.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    824.00 TO NODE    824.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE    825.00 TO NODE    826.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS COMMERCIAL
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   290.00
 UPSTREAM ELEVATION(FEET) =   1622.00
 DOWNSTREAM ELEVATION(FEET) =   1598.00
 ELEVATION DIFFERENCE(FEET) =     24.00
 TC = 0.303*[(  290.00**3)/(    24.00)]**.2 =    4.819
 COMPUTED TIME OF CONCENTRATION INCREASED TO 5 MIN.
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.775
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8877
 SOIL CLASSIFICATION IS "C"
 SUBAREA RUNOFF(CFS) =      5.70
 TOTAL AREA(ACRES) =      1.70   TOTAL RUNOFF(CFS) =      5.70

****************************************************************************
 FLOW PROCESS FROM NODE    826.00 TO NODE    827.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0100
 FLOW LENGTH(FEET) =   660.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  15.0 INCH PIPE IS  11.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.67
 ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       5.70
 PIPE TRAVEL TIME(MIN.) =   1.94    Tc(MIN.) =    6.94
 LONGEST FLOWPATH FROM NODE    825.00 TO NODE    827.00 =     950.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    827.00 TO NODE    827.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =    6.94
 RAINFALL INTENSITY(INCH/HR) =   3.22
```



```
 TOTAL STREAM AREA(ACRES) =     1.70
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.70

****************************************************************************
 FLOW PROCESS FROM NODE    828.00 TO NODE    827.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS COMMERCIAL
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   480.00
 UPSTREAM ELEVATION(FEET) =   1605.00
 DOWNSTREAM ELEVATION(FEET) =   1587.00
 ELEVATION DIFFERENCE(FEET) =     18.00
 TC = 0.303*[(  480.00**3)/(    18.00)]**.2 =    6.907
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.224
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8859
 SOIL CLASSIFICATION IS "C"
 SUBAREA RUNOFF(CFS) =      5.71
 TOTAL AREA(ACRES) =      2.00   TOTAL RUNOFF(CFS) =      5.71

****************************************************************************
 FLOW PROCESS FROM NODE    827.00 TO NODE    827.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    6.91
 RAINFALL INTENSITY(INCH/HR) =   3.22
 TOTAL STREAM AREA(ACRES) =     2.00
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.71

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        5.70     6.94        3.216          1.70
     2        5.71     6.91        3.224          2.00

 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       11.38     6.91       3.224
     2       11.40     6.94       3.216

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      11.40   Tc(MIN.) =    6.94
 TOTAL AREA(ACRES) =        3.7
 LONGEST FLOWPATH FROM NODE    825.00 TO NODE    827.00 =     950.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    827.00 TO NODE    829.00 IS CODE =  31
----------------------------------------------------------------------------
```

```
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =    100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   8.88
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.40
  PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =    7.13
  LONGEST FLOWPATH FROM NODE     825.00 TO NODE     829.00 =    1050.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    829.00 TO NODE    829.00 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.) =    7.13
  RAINFALL INTENSITY(INCH/HR) =   3.17
  TOTAL STREAM AREA(ACRES) =     3.70
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.40

****************************************************************************
  FLOW PROCESS FROM NODE    830.00 TO NODE    829.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   640.00
  UPSTREAM ELEVATION(FEET) =   1614.00
  DOWNSTREAM ELEVATION(FEET) =   1592.00
  ELEVATION DIFFERENCE(FEET) =     22.00
  TC = 0.303*[(  640.00**3)/(    22.00)]**.2 =    7.885
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.021
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8851
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      3.74
  TOTAL AREA(ACRES) =      1.40   TOTAL RUNOFF(CFS) =      3.74

****************************************************************************
  FLOW PROCESS FROM NODE    829.00 TO NODE    829.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.89
  RAINFALL INTENSITY(INCH/HR) =   3.02
  TOTAL STREAM AREA(ACRES) =     1.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.74

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



```
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       11.38     7.09        3.182         3.70
     1       11.40     7.13        3.174         3.70
     2        3.74     7.89        3.021         1.40

  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       14.75     7.09       3.182
     2       14.78     7.13       3.174
     3       14.59     7.89       3.021

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      14.78   Tc(MIN.) =    7.13
  TOTAL AREA(ACRES) =        5.1
  LONGEST FLOWPATH FROM NODE     825.00 TO NODE     829.00 =    1050.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    829.00 TO NODE    824.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =     40.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  12.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   9.55
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      14.78
  PIPE TRAVEL TIME(MIN.) =   0.07    Tc(MIN.) =    7.20
  LONGEST FLOWPATH FROM NODE     825.00 TO NODE     824.00 =    1090.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    824.00 TO NODE    824.00 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.) =    7.20
  RAINFALL INTENSITY(INCH/HR) =   3.16
  TOTAL STREAM AREA(ACRES) =     5.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     14.78

****************************************************************************
  FLOW PROCESS FROM NODE    830.00 TO NODE    831.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   640.00
  UPSTREAM ELEVATION(FEET) =   1614.00
  DOWNSTREAM ELEVATION(FEET) =   1592.00
```

```
  ELEVATION DIFFERENCE(FEET) =      22.00
  TC = 0.303*[(  640.00**3)/(     22.00)]**.2 =     7.885
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.021
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8851
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      4.28
  TOTAL AREA(ACRES) =      1.60   TOTAL RUNOFF(CFS) =      4.28

****************************************************************************
  FLOW PROCESS FROM NODE    831.00 TO NODE    824.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =    40.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   8.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.88
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.28
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =    7.98
  LONGEST FLOWPATH FROM NODE     830.00 TO NODE    824.00 =     680.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    824.00 TO NODE    824.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    7.98
  RAINFALL INTENSITY(INCH/HR) =   3.00
  TOTAL STREAM AREA(ACRES) =     1.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.28

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)      (MIN.)   (INCH/HOUR)    (ACRE)
      1       14.75     7.16        3.166          5.10
      1       14.78     7.20        3.159          5.10
      1       14.59     7.96        3.008          5.10
      2        4.28     7.98        3.003          1.60

  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       18.59     7.16       3.166
      2       18.64     7.20       3.159
      3       18.86     7.96       3.008
      4       18.85     7.98       3.003

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      18.86   Tc(MIN.) =    7.96
  TOTAL AREA(ACRES) =        6.7
```



```
  LONGEST FLOWPATH FROM NODE    825.00 TO NODE    824.00 =    1090.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    824.00 TO NODE    824.00 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       18.59     7.16       3.166         6.70
      2       18.64     7.20       3.159         6.70
      3       18.86     7.96       3.008         6.70
      4       18.85     7.98       3.003         6.70
  LONGEST FLOWPATH FROM NODE    825.00 TO NODE    824.00 =    1090.00 FEET.

  ** MEMORY BANK #  1 CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY     AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
      1       33.29     6.57       3.302        56.20
      2       52.78    10.15       2.670        56.20
      3       55.67    10.81       2.590        56.20
      4       61.19    12.56       2.406        56.20
      5       62.32    13.23       2.346        56.20
      6       81.47    18.38       1.997        56.20
      7       81.45    18.40       1.996        56.20
      8       81.83    20.66       1.886        56.20
  LONGEST FLOWPATH FROM NODE    800.00 TO NODE    824.00 =    4070.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER     (CFS)      (MIN.)   (INCH/HOUR)
      1      50.35      6.57       3.302
      2      55.84      7.16       3.166
      3      56.06      7.20       3.159
      4      60.22      7.96       3.008
      5      60.35      7.98       3.003
      6      69.53     10.15       2.670
      7      71.92     10.81       2.590
      8      76.29     12.56       2.406
      9      77.04     13.23       2.346
     10      94.00     18.38       1.997
     11      93.98     18.40       1.996
     12      93.66     20.66       1.886

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      94.00   Tc(MIN.) =   18.38
  TOTAL AREA(ACRES) =       62.9

****************************************************************************
  FLOW PROCESS FROM NODE    824.00 TO NODE    824.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    824.00 TO NODE    832.00 IS CODE =  31
```

```
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =    90.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  39.0 INCH PIPE IS  27.6 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  14.98
  ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      94.00
  PIPE TRAVEL TIME(MIN.) =   0.10    Tc(MIN.) =   18.48
  LONGEST FLOWPATH FROM NODE    800.00 TO NODE    832.00 =    4160.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    832.00 TO NODE    832.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    833.00 TO NODE    834.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   440.00
  UPSTREAM ELEVATION(FEET) =   1622.00
  DOWNSTREAM ELEVATION(FEET) =   1617.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  TC = 0.303*[(  440.00**3)/(     5.00)]**.2 =    8.470
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.918
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8847
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      8.26
  TOTAL AREA(ACRES) =      3.20   TOTAL RUNOFF(CFS) =      8.26

****************************************************************************
  FLOW PROCESS FROM NODE    834.00 TO NODE    835.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =   830.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  12.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.31
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.26
  PIPE TRAVEL TIME(MIN.) =   2.19    Tc(MIN.) =   10.66
  LONGEST FLOWPATH FROM NODE    833.00 TO NODE    835.00 =    1270.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    835.00 TO NODE    835.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
```



```
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.66
  RAINFALL INTENSITY(INCH/HR) =   2.61
  TOTAL STREAM AREA(ACRES) =     3.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.26

****************************************************************************
  FLOW PROCESS FROM NODE    833.00 TO NODE    835.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   470.00
  UPSTREAM ELEVATION(FEET) =   1622.00
  DOWNSTREAM ELEVATION(FEET) =   1617.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  TC = 0.303*[(  470.00**3)/(     5.00)]**.2 =    8.812
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.862
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8844
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      2.28
  TOTAL AREA(ACRES) =      0.90   TOTAL RUNOFF(CFS) =      2.28

****************************************************************************
  FLOW PROCESS FROM NODE    835.00 TO NODE    835.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  3
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.81
  RAINFALL INTENSITY(INCH/HR) =   2.86
  TOTAL STREAM AREA(ACRES) =     0.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.28

****************************************************************************
  FLOW PROCESS FROM NODE    836.00 TO NODE    837.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   350.00
  UPSTREAM ELEVATION(FEET) =   1620.00
  DOWNSTREAM ELEVATION(FEET) =   1615.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  TC = 0.303*[(  350.00**3)/(     5.00)]**.2 =    7.383
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.120
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8855
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      4.97
  TOTAL AREA(ACRES) =      1.80   TOTAL RUNOFF(CFS) =      4.97

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

```
 FLOW PROCESS FROM NODE    837.00 TO NODE    835.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0100
 FLOW LENGTH(FEET) =   400.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  15.0 INCH PIPE IS  10.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.56
 ESTIMATED PIPE DIAMETER(INCH) =  15.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       4.97
 PIPE TRAVEL TIME(MIN.) =   1.20    Tc(MIN.) =    8.58
 LONGEST FLOWPATH FROM NODE    836.00 TO NODE    835.00 =     750.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    835.00 TO NODE    835.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  3
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  3 ARE:
 TIME OF CONCENTRATION(MIN.) =    8.58
 RAINFALL INTENSITY(INCH/HR) =   2.90
 TOTAL STREAM AREA(ACRES) =     1.80
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.97

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        8.26    10.66        2.607          3.20
     2        2.28     8.81        2.862          0.90
     3        4.97     8.58        2.899          1.80

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

 ** PEAK FLOW RATE TABLE **
 STREAM     RUNOFF      Tc      INTENSITY
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)
     1       13.84     8.58       2.899
     2       14.01     8.81       2.862
     3       14.81    10.66       2.607

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      14.81   Tc(MIN.) =   10.66
 TOTAL AREA(ACRES) =        5.9
 LONGEST FLOWPATH FROM NODE    833.00 TO NODE    835.00 =    1270.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    835.00 TO NODE    838.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0200
 FLOW LENGTH(FEET) =    70.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  12.9 INCHES
```



```
 PIPE-FLOW VELOCITY(FEET/SEC.) =   9.55
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      14.81
 PIPE TRAVEL TIME(MIN.) =   0.12    Tc(MIN.) =   10.79
 LONGEST FLOWPATH FROM NODE    833.00 TO NODE    838.00 =    1340.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    838.00 TO NODE    838.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   10.79
 RAINFALL INTENSITY(INCH/HR) =   2.59
 TOTAL STREAM AREA(ACRES) =     5.90
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     14.81

****************************************************************************
 FLOW PROCESS FROM NODE    839.00 TO NODE    838.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
       ASSUMED INITIAL SUBAREA UNIFORM
       DEVELOPMENT IS COMMERCIAL
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   710.00
 UPSTREAM ELEVATION(FEET) =   1628.00
 DOWNSTREAM ELEVATION(FEET) =   1597.00
 ELEVATION DIFFERENCE(FEET) =     31.00
 TC = 0.303*[(  710.00**3)/(    31.00)]**.2 =    7.836
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.031
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8851
 SOIL CLASSIFICATION IS "C"
 SUBAREA RUNOFF(CFS) =      2.41
 TOTAL AREA(ACRES) =      0.90   TOTAL RUNOFF(CFS) =      2.41

****************************************************************************
 FLOW PROCESS FROM NODE    838.00 TO NODE    838.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    7.84
 RAINFALL INTENSITY(INCH/HR) =   3.03
 TOTAL STREAM AREA(ACRES) =     0.90
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.41

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       13.84     8.71        2.878          5.90
     1       14.01     8.94        2.842          5.90
     1       14.81    10.79        2.592          5.90
     2        2.41     7.84        3.031          0.90
```

```
  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       14.86     7.84       3.031
      2       16.13     8.71       2.878
      3       16.28     8.94       2.842
      4       16.87    10.79       2.592

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      16.87   Tc(MIN.) =   10.79
  TOTAL AREA(ACRES) =        6.8
  LONGEST FLOWPATH FROM NODE    833.00 TO NODE    838.00 =    1340.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    838.00 TO NODE    840.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =  1100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  16.0 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.56
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      16.87
  PIPE TRAVEL TIME(MIN.) =   2.42    Tc(MIN.) =   13.21
  LONGEST FLOWPATH FROM NODE    833.00 TO NODE    840.00 =    2440.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    840.00 TO NODE    840.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    834.00 TO NODE    841.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   400.00
  UPSTREAM ELEVATION(FEET) =   1617.00
  DOWNSTREAM ELEVATION(FEET) =   1615.00
  ELEVATION DIFFERENCE(FEET) =      2.00
  TC = 0.303*[(  400.00**3)/(     2.00)]**.2 =    9.608
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.743
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8839
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      9.21
  TOTAL AREA(ACRES) =      3.80   TOTAL RUNOFF(CFS) =      9.21

****************************************************************************
  FLOW PROCESS FROM NODE    841.00 TO NODE    842.00 IS CODE =  31
```



```
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =   160.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  13.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.40
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       9.21
  PIPE TRAVEL TIME(MIN.) =   0.42    Tc(MIN.) =   10.02
  LONGEST FLOWPATH FROM NODE    834.00 TO NODE    842.00 =     560.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    842.00 TO NODE    842.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.02
  RAINFALL INTENSITY(INCH/HR) =   2.69
  TOTAL STREAM AREA(ACRES) =     3.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.21

****************************************************************************
  FLOW PROCESS FROM NODE    843.00 TO NODE    844.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   730.00
  UPSTREAM ELEVATION(FEET) =   1635.00
  DOWNSTREAM ELEVATION(FEET) =   1618.00
  ELEVATION DIFFERENCE(FEET) =     17.00
  TC = 0.303*[(  730.00**3)/(    17.00)]**.2 =    8.984
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.835
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8843
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      2.76
  TOTAL AREA(ACRES) =      1.10   TOTAL RUNOFF(CFS) =      2.76

****************************************************************************
  FLOW PROCESS FROM NODE    844.00 TO NODE    842.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =   120.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   6.5 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.30
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.76
  PIPE TRAVEL TIME(MIN.) =   0.32    Tc(MIN.) =    9.30
  LONGEST FLOWPATH FROM NODE    843.00 TO NODE    842.00 =     850.00 FEET.
```

```
******************************************************************************
  FLOW PROCESS FROM NODE    842.00 TO NODE    842.00 IS CODE =   1
------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.30
  RAINFALL INTENSITY(INCH/HR) =   2.79
  TOTAL STREAM AREA(ACRES) =     1.10
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.76

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1        9.21    10.02        2.687          3.80
      2        2.76     9.30        2.787          1.10

  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       11.31     9.30       2.787
      2       11.87    10.02       2.687

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      11.87   Tc(MIN.) =   10.02
  TOTAL AREA(ACRES) =        4.9
  LONGEST FLOWPATH FROM NODE    843.00 TO NODE    842.00 =     850.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    842.00 TO NODE    845.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =   220.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.1 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.93
  ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      11.87
  PIPE TRAVEL TIME(MIN.) =   0.53    Tc(MIN.) =   10.55
  LONGEST FLOWPATH FROM NODE    843.00 TO NODE    845.00 =    1070.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    845.00 TO NODE    845.00 IS CODE =   1
------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.55
  RAINFALL INTENSITY(INCH/HR) =   2.62
```



```
  TOTAL STREAM AREA(ACRES) =     4.90
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.87

******************************************************************************
  FLOW PROCESS FROM NODE    846.00 TO NODE    847.00 IS CODE =  21
------------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
==============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   240.00
  UPSTREAM ELEVATION(FEET) =   1650.00
  DOWNSTREAM ELEVATION(FEET) =   1615.00
  ELEVATION DIFFERENCE(FEET) =     35.00
  TC = 0.303*[(  240.00**3)/(    35.00)]**.2 =    3.989
  COMPUTED TIME OF CONCENTRATION INCREASED TO 5 MIN.
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.775
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8877
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      2.01
  TOTAL AREA(ACRES) =      0.60   TOTAL RUNOFF(CFS) =      2.01

******************************************************************************
  FLOW PROCESS FROM NODE    847.00 TO NODE    845.00 IS CODE =  31
------------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
==============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =   260.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN   9.0 INCH PIPE IS   6.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   5.68
  ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       2.01
  PIPE TRAVEL TIME(MIN.) =   0.76    Tc(MIN.) =    5.76
  LONGEST FLOWPATH FROM NODE    846.00 TO NODE    845.00 =     500.00 FEET.

******************************************************************************
  FLOW PROCESS FROM NODE    845.00 TO NODE    845.00 IS CODE =   1
------------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
==============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    5.76
  RAINFALL INTENSITY(INCH/HR) =   3.52
  TOTAL STREAM AREA(ACRES) =     0.60
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.01

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       11.31     9.84        2.712          4.90
      1       11.87    10.55        2.620          4.90
      2        2.01     5.76        3.522          0.60
```

```
 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        8.64     5.76       3.522
     2       12.85     9.84       2.712
     3       13.37    10.55       2.620

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      13.37   Tc(MIN.) =   10.55
 TOTAL AREA(ACRES) =        5.5
 LONGEST FLOWPATH FROM NODE    843.00 TO NODE    845.00 =    1070.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    845.00 TO NODE    848.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0100
 FLOW LENGTH(FEET) =    80.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  15.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.06
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      13.37
 PIPE TRAVEL TIME(MIN.) =   0.19    Tc(MIN.) =   10.74
 LONGEST FLOWPATH FROM NODE    843.00 TO NODE    848.00 =    1150.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    848.00 TO NODE    848.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =   10.74
 RAINFALL INTENSITY(INCH/HR) =   2.60
 TOTAL STREAM AREA(ACRES) =     5.50
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     13.37

****************************************************************************
 FLOW PROCESS FROM NODE    849.00 TO NODE    848.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS COMMERCIAL
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   400.00
 UPSTREAM ELEVATION(FEET) =   1615.00
 DOWNSTREAM ELEVATION(FEET) =   1609.00
 ELEVATION DIFFERENCE(FEET) =      6.00
 TC = 0.303*[(  400.00**3)/(     6.00)]**.2 =    7.712
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.054
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8852
 SOIL CLASSIFICATION IS "C"
```



```
 SUBAREA RUNOFF(CFS) =      5.95
 TOTAL AREA(ACRES) =      2.20   TOTAL RUNOFF(CFS) =      5.95

****************************************************************************
 FLOW PROCESS FROM NODE    848.00 TO NODE    848.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    7.71
 RAINFALL INTENSITY(INCH/HR) =   3.05
 TOTAL STREAM AREA(ACRES) =     2.20
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.95

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1        8.64     5.97        3.461          5.50
     1       12.85    10.03        2.687          5.50
     1       13.37    10.74        2.597          5.50
     2        5.95     7.71        3.054          2.20

 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       13.24     5.97       3.461
     2       15.84     7.71       3.054
     3       18.09    10.03       2.687
     4       18.43    10.74       2.597

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      18.43   Tc(MIN.) =   10.74
 TOTAL AREA(ACRES) =        7.7
 LONGEST FLOWPATH FROM NODE    843.00 TO NODE    848.00 =    1150.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    848.00 TO NODE    850.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0100
 FLOW LENGTH(FEET) =   330.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  17.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   7.68
 ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      18.43
 PIPE TRAVEL TIME(MIN.) =   0.72    Tc(MIN.) =   11.46
 LONGEST FLOWPATH FROM NODE    843.00 TO NODE    850.00 =    1480.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    850.00 TO NODE    850.00 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.) =   11.46
 RAINFALL INTENSITY(INCH/HR) =   2.52
 TOTAL STREAM AREA(ACRES) =     7.70
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     18.43

****************************************************************************
 FLOW PROCESS FROM NODE    837.00 TO NODE    850.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
       ASSUMED INITIAL SUBAREA UNIFORM
       DEVELOPMENT IS COMMERCIAL
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   670.00
 UPSTREAM ELEVATION(FEET) =   1615.00
 DOWNSTREAM ELEVATION(FEET) =   1611.00
 ELEVATION DIFFERENCE(FEET) =      4.00
 TC = 0.303*[(  670.00**3)/(     4.00)]**.2 =   11.398
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.523
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8827
 SOIL CLASSIFICATION IS "C"
 SUBAREA RUNOFF(CFS) =      8.24
 TOTAL AREA(ACRES) =      3.70   TOTAL RUNOFF(CFS) =      8.24

****************************************************************************
 FLOW PROCESS FROM NODE    850.00 TO NODE    850.00 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.) =   11.40
 RAINFALL INTENSITY(INCH/HR) =   2.52
 TOTAL STREAM AREA(ACRES) =     3.70
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      8.24

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1       13.24     6.75        3.259          7.70
     1       15.84     8.45        2.921          7.70
     1       18.09    10.74        2.597          7.70
     1       18.43    11.46        2.517          7.70
     2        8.24    11.40        2.523          3.70

 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       18.12     6.75       3.259
     2       21.95     8.45       2.921
```



```
     3       25.86    10.74       2.597
     4       26.57    11.40       2.523
     5       26.65    11.46       2.517

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      26.65   Tc(MIN.) =   11.46
 TOTAL AREA(ACRES) =       11.4
 LONGEST FLOWPATH FROM NODE    843.00 TO NODE    850.00 =    1480.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    850.00 TO NODE    851.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0200
 FLOW LENGTH(FEET) =    70.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  17.4 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  10.90
 ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      26.65
 PIPE TRAVEL TIME(MIN.) =   0.11     Tc(MIN.) =   11.57
 LONGEST FLOWPATH FROM NODE    843.00 TO NODE    851.00 =    1550.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    851.00 TO NODE    851.00 IS CODE =  81
----------------------------------------------------------------------------
 >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.505
 UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7263
 SOIL CLASSIFICATION IS "C"
 SUBAREA AREA(ACRES) =     2.20   SUBAREA RUNOFF(CFS) =    4.00
 TOTAL AREA(ACRES) =       13.6   TOTAL RUNOFF(CFS) =      30.65
 TC(MIN.) =    11.57

****************************************************************************
 FLOW PROCESS FROM NODE    851.00 TO NODE    851.00 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.) =   11.57
 RAINFALL INTENSITY(INCH/HR) =   2.51
 TOTAL STREAM AREA(ACRES) =    13.60
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     30.65

****************************************************************************
 FLOW PROCESS FROM NODE    838.00 TO NODE    851.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
       ASSUMED INITIAL SUBAREA UNIFORM
       DEVELOPMENT IS COMMERCIAL
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =  1070.00
 UPSTREAM ELEVATION(FEET) =   1597.00
```

```
  DOWNSTREAM ELEVATION(FEET) =   1587.00
  ELEVATION DIFFERENCE(FEET) =     10.00
  TC = 0.303*[( 1070.00**3)/(    10.00)]**.2 =   12.567
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.406
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8821
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      3.18
  TOTAL AREA(ACRES) =      1.50   TOTAL RUNOFF(CFS) =      3.18

****************************************************************************
  FLOW PROCESS FROM NODE    851.00 TO NODE    851.00 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.) =   12.57
  RAINFALL INTENSITY(INCH/HR) =   2.41
  TOTAL STREAM AREA(ACRES) =     1.50
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.18

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       23.52     6.87        3.232         13.60
      1       26.71     8.56        2.903         13.60
      1       30.01    10.85        2.585         13.60
      1       30.58    11.50        2.512         13.60
      1       30.65    11.57        2.505         13.60
      2        3.18    12.57        2.406          1.50

  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       25.26     6.87       3.232
      2       28.88     8.56       2.903
      3       32.76    10.85       2.585
      4       33.50    11.50       2.512
      5       33.58    11.57       2.505
      6       32.61    12.57       2.406

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      33.58   Tc(MIN.) =   11.57
  TOTAL AREA(ACRES) =       15.1
  LONGEST FLOWPATH FROM NODE    843.00 TO NODE    851.00 =    1550.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    851.00 TO NODE    840.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
```



```
  DEPTH OF FLOW IN  27.0 INCH PIPE IS  18.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =  11.63
  ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      33.58
  PIPE TRAVEL TIME(MIN.) =    0.07    Tc(MIN.) =    11.64
  LONGEST FLOWPATH FROM NODE    843.00 TO NODE    840.00 =    1600.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    840.00 TO NODE    840.00 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       25.26     6.95       3.214       15.10
      2       28.88     8.64       2.890       15.10
      3       32.76    10.92       2.576       15.10
      4       33.50    11.58       2.504       15.10
      5       33.58    11.64       2.498       15.10
      6       32.61    12.64       2.399       15.10
  LONGEST FLOWPATH FROM NODE    843.00 TO NODE    840.00 =    1600.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY     AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
      1       14.86    10.41       2.638        6.80
      2       16.13    11.16       2.550        6.80
      3       16.28    11.38       2.525        6.80
      4       16.87    13.21       2.348        6.80
  LONGEST FLOWPATH FROM NODE    833.00 TO NODE    840.00 =    2440.00 FEET.

  ** PEAK FLOW RATE TABLE **
  STREAM    RUNOFF       Tc      INTENSITY
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)
      1       35.31     6.95        3.214
      2       41.37     8.64        2.890
      3       46.08    10.41        2.638
      4       48.56    10.92        2.576
      5       48.56    11.16        2.550
      6       49.21    11.38        2.525
      7       49.64    11.58        2.504
      8       49.68    11.64        2.498
      9       48.76    12.64        2.399
     10       48.79    13.21        2.348

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      49.68   Tc(MIN.) =   11.64
  TOTAL AREA(ACRES) =       21.9

****************************************************************************
  FLOW PROCESS FROM NODE    840.00 TO NODE    840.00 IS CODE =  12
----------------------------------------------------------------------------
  >>>>>CLEAR MEMORY BANK # 2 <<<<<
============================================================================

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

```
 FLOW PROCESS FROM NODE    840.00 TO NODE    832.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0200
 FLOW LENGTH(FEET) =   140.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  30.0 INCH PIPE IS  22.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  12.69
 ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =     49.68
 PIPE TRAVEL TIME(MIN.) =   0.18    Tc(MIN.) =   11.82
 LONGEST FLOWPATH FROM NODE    833.00 TO NODE    832.00 =    2580.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    832.00 TO NODE    832.00 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       35.31      7.15       3.170       21.90
     2       41.37      8.83       2.859       21.90
     3       46.08     10.60       2.615       21.90
     4       48.56     11.11       2.555       21.90
     5       48.56     11.34       2.530       21.90
     6       49.21     11.56       2.506       21.90
     7       49.64     11.76       2.485       21.90
     8       49.68     11.82       2.479       21.90
     9       48.76     12.82       2.382       21.90
    10       48.79     13.39       2.332       21.90
 LONGEST FLOWPATH FROM NODE    833.00 TO NODE    832.00 =    2580.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
     1       50.35      6.69       3.274       62.90
     2       55.84      7.28       3.142       62.90
     3       56.06      7.31       3.135       62.90
     4       60.22      8.07       2.988       62.90
     5       60.35      8.09       2.983       62.90
     6       69.53     10.26       2.656       62.90
     7       71.92     10.92       2.577       62.90
     8       76.29     12.67       2.396       62.90
     9       77.04     13.34       2.336       62.90
    10       94.00     18.48       1.992       62.90
    11       93.98     18.50       1.991       62.90
    12       93.66     20.76       1.882       62.90
 LONGEST FLOWPATH FROM NODE    800.00 TO NODE    832.00 =    4160.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc      INTENSITY
 NUMBER     (CFS)      (MIN.)   (INCH/HOUR)
     1      83.42       6.69        3.274
     2      90.14       7.15        3.170
     3      90.84       7.28        3.142
```



```
     4      90.98       7.31        3.135
     5      98.00       8.07        2.988
     6      98.26       8.09        2.983
     7     101.21       8.83        2.859
     8     114.39      10.26        2.656
     9     115.89      10.60        2.615
    10     119.63      10.92        2.577
    11     119.86      11.11        2.555
    12     119.15      11.34        2.530
    13     119.12      11.56        2.506
    14     120.48      11.76        2.485
    15     120.89      11.82        2.479
    16     124.45      12.67        2.396
    17     124.59      12.82        2.382
    18     125.63      13.34        2.336
    19     125.68      13.39        2.332
    20     135.68      18.48        1.992
    21     135.63      18.50        1.991
    22     133.04      20.76        1.882

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =     135.68   Tc(MIN.) =   18.48
 TOTAL AREA(ACRES) =       84.8

****************************************************************************
 FLOW PROCESS FROM NODE    832.00 TO NODE    832.00 IS CODE =  12
----------------------------------------------------------------------------
 >>>>>CLEAR MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE    832.00 TO NODE    852.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0360
 FLOW LENGTH(FEET) =   700.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  39.0 INCH PIPE IS  29.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  20.31
 ESTIMATED PIPE DIAMETER(INCH) =  39.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =    135.68
 PIPE TRAVEL TIME(MIN.) =   0.57    Tc(MIN.) =   19.06
 LONGEST FLOWPATH FROM NODE    800.00 TO NODE    852.00 =    4860.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =       84.8  TC(MIN.) =     19.06
 PEAK FLOW RATE(CFS)   =     135.68
 *** PEAK FLOW RATE TABLE ***
        Q(CFS)   Tc(MIN.)
 1       83.42       7.34
 2       90.14       7.79
 3       90.84       7.92
 4       90.98       7.95
 5       98.00       8.68
 6       98.26       8.71
 7      101.21       9.44
 8      114.39      10.86
```

9	115.89	11.20
10	119.63	11.52
11	119.86	11.71
12	119.15	11.94
13	119.12	12.17
14	120.48	12.35
15	120.89	12.41
16	124.45	13.25
17	124.59	13.40
18	125.63	13.92
19	125.68	13.97
20	135.68	19.06
21	135.63	19.08
22	133.04	21.34

END OF RATIONAL METHOD ANALYSIS

```
****************************************************************************
          RATIONAL METHOD HYDROLOGY COMPUTER PROGRAM BASED ON
      RIVERSIDE COUNTY FLOOD CONTROL & WATER CONSERVATION DISTRICT
                   (RCFC&WCD)  1978 HYDROLOGY MANUAL
     (c) Copyright 1982-2013 Advanced Engineering Software (aes)
                   (Rational Tabling Version 20.0)
               Release Date: 06/01/2013  License ID 1264

                        Analysis prepared by:




 ************************** DESCRIPTION OF STUDY **************************
* MEAD VALLEY BUSINESS PARK                                                *
* PRELIMINARY PROPOSED CONDITION RATIONAL METHOD HYDROLOGY                  *
* 100 YEAR STORM EVENT FOR AREA TRIBUTARY TO LATERAL B-9AA                 *
 **************************************************************************

  FILE NAME: P100B9AA.DAT
  TIME/DATE OF STUDY: 13:54 07/03/2019
----------------------------------------------------------------------------
  USER SPECIFIED HYDROLOGY AND HYDRAULIC MODEL INFORMATION:
----------------------------------------------------------------------------
  USER SPECIFIED STORM EVENT(YEAR) =  100.00
  SPECIFIED MINIMUM PIPE SIZE(INCH) =   6.00
  SPECIFIED PERCENT OF GRADIENTS(DECIMAL) TO USE FOR FRICTION SLOPE = 0.90
  10-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  1.880
  10-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  0.780
  100-YEAR STORM 10-MINUTE INTENSITY(INCH/HOUR) =  2.690
  100-YEAR STORM 60-MINUTE INTENSITY(INCH/HOUR) =  1.120
  SLOPE OF 10-YEAR INTENSITY-DURATION CURVE =  0.4909883
  SLOPE OF 100-YEAR INTENSITY-DURATION CURVE =  0.4890234
  COMPUTED RAINFALL INTENSITY DATA:
  STORM EVENT =  100.00   1-HOUR INTENSITY(INCH/HOUR) =   1.120
  SLOPE OF INTENSITY DURATION CURVE = 0.4890
  RCFC&WCD HYDROLOGY MANUAL "C"-VALUES USED FOR RATIONAL METHOD
  NOTE: CONSIDER ALL CONFLUENCE STREAM COMBINATIONS
        FOR ALL DOWNSTREAM ANALYSES
  *USER-DEFINED STREET-SECTIONS FOR COUPLED PIPEFLOW AND STREETFLOW MODEL*
     HALF-  CROWN TO   STREET-CROSSFALL:  CURB  GUTTER-GEOMETRIES:  MANNING
     WIDTH  CROSSFALL  IN-  / OUT-/PARK-  HEIGHT  WIDTH  LIP   HIKE  FACTOR
NO.   (FT)     (FT)    SIDE / SIDE/ WAY    (FT)    (FT)  (FT)  (FT)    (n)
===  =====  =========  =================  ======  ===== ====== ===== =======
  1   30.0     20.0    0.018/0.018/0.020   0.67    2.00 0.0313 0.167 0.0150

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

****************************************************************************
  FLOW PROCESS FROM NODE    900.00 TO NODE    901.00 IS CODE =  21
```



```
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =  1140.00
  UPSTREAM ELEVATION(FEET) =   1592.00
  DOWNSTREAM ELEVATION(FEET) =   1567.00
  ELEVATION DIFFERENCE(FEET) =     25.00
  TC = 0.303*[( 1140.00**3)/(    25.00)]**.2 =   10.868
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.583
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8831
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      4.56
  TOTAL AREA(ACRES) =      2.00   TOTAL RUNOFF(CFS) =      4.56

****************************************************************************
  FLOW PROCESS FROM NODE    901.00 TO NODE    901.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.583
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7306
  SOIL CLASSIFICATION IS "C"
  SUBAREA AREA(ACRES) =    1.70   SUBAREA RUNOFF(CFS) =    3.21
  TOTAL AREA(ACRES) =       3.7   TOTAL RUNOFF(CFS) =       7.77
  TC(MIN.) =   10.87

****************************************************************************
  FLOW PROCESS FROM NODE    901.00 TO NODE    902.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0150
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.32
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       7.77
  PIPE TRAVEL TIME(MIN.) =   0.23    Tc(MIN.) =   11.10
  LONGEST FLOWPATH FROM NODE    900.00 TO NODE    902.00 =    1240.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    902.00 TO NODE    902.00 IS CODE =  10
----------------------------------------------------------------------------
  >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 1 <<<<<
============================================================================

****************************************************************************
  FLOW PROCESS FROM NODE    903.00 TO NODE    904.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
```

```
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   190.00
 UPSTREAM ELEVATION(FEET) =   1598.00
 DOWNSTREAM ELEVATION(FEET) =   1597.00
 ELEVATION DIFFERENCE(FEET) =      1.00
 TC = 0.303*[(  190.00**3)/(     1.00)]**.2 =    7.061
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.189
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8858
 SOIL CLASSIFICATION IS "C"
 SUBAREA RUNOFF(CFS) =      4.80
 TOTAL AREA(ACRES) =      1.70   TOTAL RUNOFF(CFS) =      4.80

****************************************************************************
 FLOW PROCESS FROM NODE    904.00 TO NODE    905.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0060
 FLOW LENGTH(FEET) =   370.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  18.0 INCH PIPE IS  10.3 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   4.60
 ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       4.80
 PIPE TRAVEL TIME(MIN.) =   1.34    Tc(MIN.) =    8.40
 LONGEST FLOWPATH FROM NODE    903.00 TO NODE    905.00 =     560.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    905.00 TO NODE    905.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =    8.40
 RAINFALL INTENSITY(INCH/HR) =   2.93
 TOTAL STREAM AREA(ACRES) =     1.70
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.80

****************************************************************************
 FLOW PROCESS FROM NODE    904.00 TO NODE    905.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS COMMERCIAL
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   370.00
 UPSTREAM ELEVATION(FEET) =   1597.00
 DOWNSTREAM ELEVATION(FEET) =   1595.00
 ELEVATION DIFFERENCE(FEET) =      2.00
 TC = 0.303*[(  370.00**3)/(     2.00)]**.2 =    9.169
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.807
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8842
 SOIL CLASSIFICATION IS "C"
 SUBAREA RUNOFF(CFS) =      7.20
 TOTAL AREA(ACRES) =      2.90   TOTAL RUNOFF(CFS) =      7.20

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



```
 FLOW PROCESS FROM NODE    905.00 TO NODE    905.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.17
 RAINFALL INTENSITY(INCH/HR) =   2.81
 TOTAL STREAM AREA(ACRES) =     2.90
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      7.20

 ** CONFLUENCE DATA **
 STREAM     RUNOFF       Tc      INTENSITY      AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
    1        4.80     8.40        2.929          1.70
    2        7.20     9.17        2.807          2.90

 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       11.40     8.40       2.929
    2       11.80     9.17       2.807

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      11.80   Tc(MIN.) =    9.17
 TOTAL AREA(ACRES) =        4.6
 LONGEST FLOWPATH FROM NODE    903.00 TO NODE    905.00 =     560.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    905.00 TO NODE    906.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0100
 FLOW LENGTH(FEET) =   160.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  21.0 INCH PIPE IS  14.0 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   6.92
 ESTIMATED PIPE DIAMETER(INCH) =  21.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      11.80
 PIPE TRAVEL TIME(MIN.) =   0.39    Tc(MIN.) =    9.55
 LONGEST FLOWPATH FROM NODE    903.00 TO NODE    906.00 =     720.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    906.00 TO NODE    906.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.55
 RAINFALL INTENSITY(INCH/HR) =   2.75
 TOTAL STREAM AREA(ACRES) =     4.60
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     11.80
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    907.00 TO NODE    908.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =  1030.00
  UPSTREAM ELEVATION(FEET) =   1646.00
  DOWNSTREAM ELEVATION(FEET) =   1596.00
  ELEVATION DIFFERENCE(FEET) =     50.00
  TC = 0.303*[( 1030.00**3)/(    50.00)]**.2 =    8.902
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.847
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8844
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      3.53
  TOTAL AREA(ACRES) =      1.40   TOTAL RUNOFF(CFS) =      3.53

****************************************************************************
  FLOW PROCESS FROM NODE    908.00 TO NODE    906.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =   100.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.7 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.65
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      3.53
  PIPE TRAVEL TIME(MIN.) =   0.25    Tc(MIN.) =    9.15
  LONGEST FLOWPATH FROM NODE    907.00 TO NODE    906.00 =    1130.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    906.00 TO NODE    906.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.15
  RAINFALL INTENSITY(INCH/HR) =   2.81
  TOTAL STREAM AREA(ACRES) =     1.40
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      3.53

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       11.40     8.79        2.865         4.60
      1       11.80     9.55        2.751         4.60
      2        3.53     9.15        2.809         1.40

  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       14.78     8.79       2.865
      2       14.83     9.15       2.809
      3       15.25     9.55       2.751

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      15.25   Tc(MIN.) =    9.55
  TOTAL AREA(ACRES) =        6.0
  LONGEST FLOWPATH FROM NODE    907.00 TO NODE    906.00 =    1130.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    906.00 TO NODE    909.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  14.9 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.41
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =     15.25
  PIPE TRAVEL TIME(MIN.) =   0.11    Tc(MIN.) =    9.67
  LONGEST FLOWPATH FROM NODE    907.00 TO NODE    909.00 =    1180.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    909.00 TO NODE    909.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =    9.67
  RAINFALL INTENSITY(INCH/HR) =   2.74
  TOTAL STREAM AREA(ACRES) =     6.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     15.25

****************************************************************************
  FLOW PROCESS FROM NODE    910.00 TO NODE    909.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   250.00
  UPSTREAM ELEVATION(FEET) =   1597.00
  DOWNSTREAM ELEVATION(FEET) =   1591.00
  ELEVATION DIFFERENCE(FEET) =      6.00
  TC = 0.303*[(  250.00**3)/(     6.00)]**.2 =    5.817
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  3.506
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8869
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      6.22
  TOTAL AREA(ACRES) =      2.00   TOTAL RUNOFF(CFS) =      6.22
```

```
****************************************************************************
  FLOW PROCESS FROM NODE    909.00 TO NODE    909.00 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.) =    5.82
  RAINFALL INTENSITY(INCH/HR) =   3.51
  TOTAL STREAM AREA(ACRES) =     2.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      6.22

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       14.78     8.91        2.847          6.00
      1       14.83     9.27        2.792          6.00
      1       15.25     9.67        2.735          6.00
      2        6.22     5.82        3.506          2.00

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

  ** PEAK FLOW RATE TABLE **
  STREAM     RUNOFF      Tc      INTENSITY
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)
      1       15.87     5.82       3.506
      2       19.83     8.91       2.847
      3       19.78     9.27       2.792
      4       20.10     9.67       2.735

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =      20.10   Tc(MIN.) =    9.67
  TOTAL AREA(ACRES) =        8.0
  LONGEST FLOWPATH FROM NODE    907.00 TO NODE    909.00 =    1180.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    909.00 TO NODE    911.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0100
  FLOW LENGTH(FEET) =   430.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  24.0 INCH PIPE IS  18.4 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.77
  ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =      20.10
  PIPE TRAVEL TIME(MIN.) =   0.92    Tc(MIN.) =   10.59
  LONGEST FLOWPATH FROM NODE    907.00 TO NODE    911.00 =    1610.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    911.00 TO NODE    911.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
```



```
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  1 ARE:
  TIME OF CONCENTRATION(MIN.) =   10.59
  RAINFALL INTENSITY(INCH/HR) =   2.62
  TOTAL STREAM AREA(ACRES) =     8.00
  PEAK FLOW RATE(CFS) AT CONFLUENCE =     20.10

****************************************************************************
  FLOW PROCESS FROM NODE    912.00 TO NODE    911.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   820.00
  UPSTREAM ELEVATION(FEET) =   1597.00
  DOWNSTREAM ELEVATION(FEET) =   1592.00
  ELEVATION DIFFERENCE(FEET) =      5.00
  TC = 0.303*[(  820.00**3)/(     5.00)]**.2 =   12.305
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.431
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8822
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      9.01
  TOTAL AREA(ACRES) =      4.20   TOTAL RUNOFF(CFS) =      9.01

****************************************************************************
  FLOW PROCESS FROM NODE    911.00 TO NODE    911.00 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.) =   12.30
  RAINFALL INTENSITY(INCH/HR) =   2.43
  TOTAL STREAM AREA(ACRES) =     4.20
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      9.01

  ** CONFLUENCE DATA **
  STREAM     RUNOFF      Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
      1       15.87     6.78        3.254          8.00
      1       19.83     9.83        2.713          8.00
      1       19.78    10.19        2.665          8.00
      1       20.10    10.59        2.616          8.00
      2        9.01    12.30        2.431          4.20

  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       20.83     6.78       3.254
      2       27.02     9.83       2.713
      3       27.24    10.19       2.665
      4       27.85    10.59       2.616
      5       27.68    12.30       2.431
```

```
 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      27.85   Tc(MIN.) =   10.59
 TOTAL AREA(ACRES) =       12.2
 LONGEST FLOWPATH FROM NODE    907.00 TO NODE    911.00 =    1610.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    911.00 TO NODE    902.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0200
 FLOW LENGTH(FEET) =   130.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  24.0 INCH PIPE IS  18.1 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  10.96
 ESTIMATED PIPE DIAMETER(INCH) =  24.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      27.85
 PIPE TRAVEL TIME(MIN.) =   0.20    Tc(MIN.) =   10.79
 LONGEST FLOWPATH FROM NODE    907.00 TO NODE    902.00 =    1740.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    902.00 TO NODE    902.00 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       20.83     6.99       3.205       12.20
     2       27.02    10.03       2.686       12.20
     3       27.24    10.39       2.640       12.20
     4       27.85    10.79       2.592       12.20
     5       27.68    12.50       2.412       12.20
 LONGEST FLOWPATH FROM NODE    907.00 TO NODE    902.00 =    1740.00 FEET.

 ** MEMORY BANK #  1 CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)     (MIN.)   (INCH/HOUR)   (ACRE)
     1        7.77    11.10       2.557        3.70
 LONGEST FLOWPATH FROM NODE    900.00 TO NODE    902.00 =    1240.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc      INTENSITY
 NUMBER     (CFS)      (MIN.)   (INCH/HOUR)
     1      25.73       6.99        3.205
     2      34.05      10.03        2.686
     3      34.52      10.39        2.640
     4      35.40      10.79        2.592
     5      35.24      11.10        2.557
     6      35.01      12.50        2.412

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      35.40   Tc(MIN.) =   10.79
 TOTAL AREA(ACRES) =       15.9

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



```
 FLOW PROCESS FROM NODE    902.00 TO NODE    913.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0150
 FLOW LENGTH(FEET) =   130.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  27.0 INCH PIPE IS  21.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  10.32
 ESTIMATED PIPE DIAMETER(INCH) =  27.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      35.40
 PIPE TRAVEL TIME(MIN.) =   0.21    Tc(MIN.) =   11.00
 LONGEST FLOWPATH FROM NODE    907.00 TO NODE    913.00 =    1870.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    913.00 TO NODE    913.00 IS CODE =  10
----------------------------------------------------------------------------
 >>>>>MAIN-STREAM MEMORY COPIED ONTO MEMORY BANK # 2 <<<<<
============================================================================

****************************************************************************
 FLOW PROCESS FROM NODE    914.00 TO NODE    915.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
        ASSUMED INITIAL SUBAREA UNIFORM
        DEVELOPMENT IS: UNDEVELOPED WITH POOR COVER
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   640.00
 UPSTREAM ELEVATION(FEET) =   1654.00
 DOWNSTREAM ELEVATION(FEET) =   1603.00
 ELEVATION DIFFERENCE(FEET) =     51.00
 TC = 0.533*[(  640.00**3)/(    51.00)]**.2 =   11.711
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.490
 UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7255
 SOIL CLASSIFICATION IS "C"
 SUBAREA RUNOFF(CFS) =      5.06
 TOTAL AREA(ACRES) =      2.80   TOTAL RUNOFF(CFS) =      5.06

****************************************************************************
 FLOW PROCESS FROM NODE    915.00 TO NODE    916.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0500
 FLOW LENGTH(FEET) =   640.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  12.0 INCH PIPE IS   7.2 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  10.31
 ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       5.06
 PIPE TRAVEL TIME(MIN.) =   1.03    Tc(MIN.) =   12.75
 LONGEST FLOWPATH FROM NODE    914.00 TO NODE    916.00 =    1280.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    916.00 TO NODE    916.00 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.) =   12.75
  RAINFALL INTENSITY(INCH/HR) =   2.39
  TOTAL STREAM AREA(ACRES) =     2.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      5.06

****************************************************************************
  FLOW PROCESS FROM NODE    917.00 TO NODE    918.00 IS CODE =  21
----------------------------------------------------------------------------
  >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
         ASSUMED INITIAL SUBAREA UNIFORM
         DEVELOPMENT IS COMMERCIAL
  TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
  INITIAL SUBAREA FLOW-LENGTH(FEET) =   840.00
  UPSTREAM ELEVATION(FEET) =   1606.00
  DOWNSTREAM ELEVATION(FEET) =   1567.00
  ELEVATION DIFFERENCE(FEET) =     39.00
  TC = 0.303*[(  840.00**3)/(    39.00)]**.2 =    8.278
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.950
  COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8848
  SOIL CLASSIFICATION IS "C"
  SUBAREA RUNOFF(CFS) =      3.39
  TOTAL AREA(ACRES) =      1.30   TOTAL RUNOFF(CFS) =      3.39

****************************************************************************
  FLOW PROCESS FROM NODE    918.00 TO NODE    918.00 IS CODE =  81
----------------------------------------------------------------------------
  >>>>>ADDITION OF SUBAREA TO MAINLINE PEAK FLOW<<<<<
============================================================================
   100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.950
  UNDEVELOPED WATERSHED RUNOFF COEFFICIENT = .7481
  SOIL CLASSIFICATION IS "C"
  SUBAREA AREA(ACRES) =    0.50   SUBAREA RUNOFF(CFS) =    1.10
  TOTAL AREA(ACRES) =       1.8   TOTAL RUNOFF(CFS) =       4.50
  TC(MIN.) =    8.28

****************************************************************************
  FLOW PROCESS FROM NODE    918.00 TO NODE    916.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0200
  FLOW LENGTH(FEET) =   130.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  12.0 INCH PIPE IS   9.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   6.92
  ESTIMATED PIPE DIAMETER(INCH) =  12.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       4.50
  PIPE TRAVEL TIME(MIN.) =   0.31    Tc(MIN.) =    8.59
  LONGEST FLOWPATH FROM NODE    917.00 TO NODE    916.00 =     970.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    916.00 TO NODE    916.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
```



```
  >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
  TOTAL NUMBER OF STREAMS =  2
  CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
  TIME OF CONCENTRATION(MIN.) =    8.59
  RAINFALL INTENSITY(INCH/HR) =   2.90
  TOTAL STREAM AREA(ACRES) =     1.80
  PEAK FLOW RATE(CFS) AT CONFLUENCE =      4.50

  ** CONFLUENCE DATA **
  STREAM     RUNOFF       Tc      INTENSITY      AREA
  NUMBER      (CFS)     (MIN.)   (INCH/HOUR)    (ACRE)
     1         5.06    12.75        2.389          2.80
     2         4.50     8.59        2.897          1.80

  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         7.91     8.59       2.897
     2         8.77    12.75       2.389

  COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
  PEAK FLOW RATE(CFS) =       8.77   Tc(MIN.) =   12.75
  TOTAL AREA(ACRES) =        4.6
  LONGEST FLOWPATH FROM NODE    914.00 TO NODE    916.00 =    1280.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    916.00 TO NODE    913.00 IS CODE =  31
----------------------------------------------------------------------------
  >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
  >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
  REPRESENTATIVE SLOPE =  0.0150
  FLOW LENGTH(FEET) =   130.00   MANNING'S N =  0.013
  DEPTH OF FLOW IN  18.0 INCH PIPE IS  11.3 INCHES
  PIPE-FLOW VELOCITY(FEET/SEC.) =   7.51
  ESTIMATED PIPE DIAMETER(INCH) =  18.00    NUMBER OF PIPES =   1
  PIPE-FLOW(CFS) =       8.77
  PIPE TRAVEL TIME(MIN.) =   0.29    Tc(MIN.) =   13.03
  LONGEST FLOWPATH FROM NODE    914.00 TO NODE    913.00 =    1410.00 FEET.

****************************************************************************
  FLOW PROCESS FROM NODE    913.00 TO NODE    913.00 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         7.91     8.89       2.850        4.60
     2         8.77    13.03       2.363        4.60
  LONGEST FLOWPATH FROM NODE    914.00 TO NODE    913.00 =    1410.00 FEET.

  ** MEMORY BANK #  2 CONFLUENCE DATA **
```

```
 STREAM     RUNOFF      Tc      INTENSITY     AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)   (ACRE)
     1       25.73     7.22       3.155       15.90
     2       34.05    10.24       2.659       15.90
     3       34.52    10.60       2.614       15.90
     4       35.40    11.00       2.568       15.90
     5       35.24    11.31       2.533       15.90
     6       35.01    12.71       2.392       15.90
 LONGEST FLOWPATH FROM NODE    907.00 TO NODE    913.00 =    1870.00 FEET.

 ** PEAK FLOW RATE TABLE **
 STREAM    RUNOFF       Tc      INTENSITY
 NUMBER     (CFS)     (MIN.)   (INCH/HOUR)
     1      32.15      7.22       3.155
     2      37.46      8.89       2.850
     3      41.42     10.24       2.659
     4      41.77     10.60       2.614
     5      42.80     11.00       2.568
     6      42.84     11.31       2.533
     7      43.56     12.71       2.392
     8      43.35     13.03       2.363

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      43.56   Tc(MIN.) =   12.71
 TOTAL AREA(ACRES) =       20.5

****************************************************************************
 FLOW PROCESS FROM NODE    913.00 TO NODE    919.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0150
 FLOW LENGTH(FEET) =   170.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN  30.0 INCH PIPE IS  22.5 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =  11.01
 ESTIMATED PIPE DIAMETER(INCH) =  30.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =      43.56
 PIPE TRAVEL TIME(MIN.) =   0.26    Tc(MIN.) =   12.97
 LONGEST FLOWPATH FROM NODE    907.00 TO NODE    919.00 =    2040.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    913.00 TO NODE    913.00 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.) =   12.97
 RAINFALL INTENSITY(INCH/HR) =   2.37
 TOTAL STREAM AREA(ACRES) =   20.50
 PEAK FLOW RATE(CFS) AT CONFLUENCE =     43.56

****************************************************************************
 FLOW PROCESS FROM NODE    920.00 TO NODE    921.00 IS CODE =  21
----------------------------------------------------------------------------
 >>>>>RATIONAL METHOD INITIAL SUBAREA ANALYSIS<<<<<
============================================================================
```



```
       ASSUMED INITIAL SUBAREA UNIFORM
       DEVELOPMENT IS COMMERCIAL
 TC = K*[(LENGTH**3)/(ELEVATION CHANGE)]**.2
 INITIAL SUBAREA FLOW-LENGTH(FEET) =   900.00
 UPSTREAM ELEVATION(FEET) =   1595.00
 DOWNSTREAM ELEVATION(FEET) =   1562.00
 ELEVATION DIFFERENCE(FEET) =     33.00
 TC = 0.303*[(  900.00**3)/(    33.00)]**.2 =    8.921
  100 YEAR RAINFALL INTENSITY(INCH/HOUR) =  2.844
 COMMERCIAL DEVELOPMENT RUNOFF COEFFICIENT = .8843
 SOIL CLASSIFICATION IS "C"
 SUBAREA RUNOFF(CFS) =      2.01
 TOTAL AREA(ACRES) =      0.80   TOTAL RUNOFF(CFS) =      2.01

****************************************************************************
 FLOW PROCESS FROM NODE    921.00 TO NODE    919.00 IS CODE =  31
----------------------------------------------------------------------------
 >>>>>COMPUTE PIPE-FLOW TRAVEL TIME THRU SUBAREA<<<<<
 >>>>>USING COMPUTER-ESTIMATED PIPESIZE (NON-PRESSURE FLOW)<<<<<
============================================================================
 REPRESENTATIVE SLOPE =  0.0200
 FLOW LENGTH(FEET) =    50.00   MANNING'S N =  0.013
 DEPTH OF FLOW IN   9.0 INCH PIPE IS   6.7 INCHES
 PIPE-FLOW VELOCITY(FEET/SEC.) =   5.69
 ESTIMATED PIPE DIAMETER(INCH) =   9.00    NUMBER OF PIPES =   1
 PIPE-FLOW(CFS) =       2.01
 PIPE TRAVEL TIME(MIN.) =   0.15    Tc(MIN.) =    9.07
 LONGEST FLOWPATH FROM NODE    920.00 TO NODE    919.00 =     950.00 FEET.

****************************************************************************
 FLOW PROCESS FROM NODE    919.00 TO NODE    919.00 IS CODE =   1
----------------------------------------------------------------------------
 >>>>>DESIGNATE INDEPENDENT STREAM FOR CONFLUENCE<<<<<
 >>>>>AND COMPUTE VARIOUS CONFLUENCED STREAM VALUES<<<<<
============================================================================
 TOTAL NUMBER OF STREAMS =  2
 CONFLUENCE VALUES USED FOR INDEPENDENT STREAM  2 ARE:
 TIME OF CONCENTRATION(MIN.) =    9.07
 RAINFALL INTENSITY(INCH/HR) =   2.82
 TOTAL STREAM AREA(ACRES) =     0.80
 PEAK FLOW RATE(CFS) AT CONFLUENCE =      2.01

 ** CONFLUENCE DATA **
 STREAM     RUNOFF      Tc      INTENSITY      AREA
 NUMBER      (CFS)    (MIN.)   (INCH/HOUR)    (ACRE)
     1       32.15     7.50       3.097         20.50
     1       37.46     9.15       2.809         20.50
     1       41.42    10.50       2.627         20.50
     1       41.77    10.86       2.583         20.50
     1       42.80    11.25       2.539         20.50
     1       42.84    11.56       2.506         20.50
     1       43.56    12.97       2.369         20.50
     1       43.35    13.29       2.341         20.50
     2        2.01     9.07       2.822          0.80

 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       33.81     7.50       3.097
     2       39.13     9.07       2.822
     3       39.46     9.15       2.809
     4       43.30    10.50       2.627
     5       43.61    10.86       2.583
     6       44.61    11.25       2.539
     7       44.63    11.56       2.506
     8       45.25    12.97       2.369
     9       45.02    13.29       2.341

 COMPUTED CONFLUENCE ESTIMATES ARE AS FOLLOWS:
 PEAK FLOW RATE(CFS) =      45.25   Tc(MIN.) =   12.97
 TOTAL AREA(ACRES) =       21.3
 LONGEST FLOWPATH FROM NODE    907.00 TO NODE    919.00 =    2040.00 FEET.
============================================================================
 END OF STUDY SUMMARY:
 TOTAL AREA(ACRES)     =       21.3  TC(MIN.) =     12.97
 PEAK FLOW RATE(CFS)   =      45.25
 *** PEAK FLOW RATE TABLE ***
        Q(CFS)   Tc(MIN.)
 1       33.81       7.50
 2       39.13       9.07
 3       39.46       9.15
 4       43.30      10.50
 5       43.61      10.86
 6       44.61      11.25
 7       44.63      11.56
 8       45.25      12.97
 9       45.02      13.29
============================================================================
============================================================================
 END OF RATIONAL METHOD ANALYSIS
```

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

          F L O O D    R O U T I N G    A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                  (RCFC&WCD) 1978 HYDROLOGY MANUAL
        (c) Copyright 1989-2013 Advanced Engineering Software (aes)
               (Synthetic Unit Hydrograph Version 20.0)
               Release Date: 06/01/2013  License ID 1264

                        Analysis prepared by:



 ************************** DESCRIPTION OF STUDY **************************
* MEAD VALLEY BUSINESS PARK                                                *
* PRELIMINARY EXISTING CONDITION HYDROGRAPH DEVELOPMENT                    *
* 10 YEAR - 24 HOUR STORM - 15 MIN INTERVAL AMC II                         *
 **************************************************************************

  FILE NAME: E10_B8.DAT
  TIME/DATE OF STUDY: 13:19 06/18/2019
```



```
****************************************************************************
  FLOW PROCESS FROM NODE    800.00 TO NODE    808.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =      71.000 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.296 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.115
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.900
         MINIMUM SOIL-LOSS RATE(INCH/HOUR) =   0.058
         USER-ENTERED RAINFALL =  3.10 INCHES
         RCFC&WCD 24-Hour Storm (15-Minute period) SELECTED
         RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 0.9999


         UNIT HYDROGRAPH TIME UNIT =  15.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  84.374


============================================================================
                      UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
```

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	14.297	40.921
2	60.254	131.537
3	79.116	53.988
4	87.017	22.614
5	91.632	13.208
6	94.693	8.761
7	96.785	5.988
8	98.126	3.840
9	98.762	1.819
10	99.344	1.666
11	99.738	1.126
12	99.934	0.563
13	100.000	0.188

```
----------------------------------------------------------------------------

         TOTAL STORM RAINFALL(INCHES) =  3.10
         TOTAL SOIL-LOSS(INCHES) =  1.70
         TOTAL EFFECTIVE RAINFALL(INCHES) =  1.39
```

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

              F L O O D    R O U T I N G    A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                    (RCFC&WCD) 1978 HYDROLOGY MANUAL
          (c) Copyright 1989-2013 Advanced Engineering Software (aes)
                   (Synthetic Unit Hydrograph Version 20.0)
                   Release Date: 06/01/2013  License ID 1264

                          Analysis prepared by:




 ************************** DESCRIPTION OF STUDY **************************
* MEAD VALLEY BUSINESS PARK                                               *
* PRELIMINARY PROPOSED CONDITION HYDROGRAPH DEVELOPMENT                   *
* 10 YEAR - 24 HOUR STORM - 15 MIN INTERVAL AMC II                        *
 **************************************************************************

  FILE NAME: P10_B8.DAT
  TIME/DATE OF STUDY: 15:53 07/03/2019
```



```
****************************************************************************
  FLOW PROCESS FROM NODE    800.00 TO NODE    832.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =      84.800 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.258 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.107
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.900
         MINIMUM SOIL-LOSS RATE(INCH/HOUR) =   0.054
         USER-ENTERED RAINFALL =  3.10 INCHES
         RCFC&WCD 24-Hour Storm (15-Minute period) SELECTED
         RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 0.9998


         UNIT HYDROGRAPH TIME UNIT =  15.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME =  96.749



============================================================================
                      UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL          "S" GRAPH          UNIT HYDROGRAPH
     NUMBER          MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
        1              17.999                 61.531
        2              66.253                164.954
        3              82.532                 55.651
        4              89.617                 24.221
        5              93.753                 14.138
        6              96.438                  9.178
        7              98.069                  5.577
        8              98.823                  2.575
        9              99.424                  2.057
       10              99.770                  1.181
       11              99.942                  0.590
       12             100.000                  0.197


----------------------------------------------------------------------------

         TOTAL STORM RAINFALL(INCHES) =  3.10
         TOTAL SOIL-LOSS(INCHES) =  1.64
         TOTAL EFFECTIVE RAINFALL(INCHES) =  1.46

----------------------------------------------------------------------------
```

```
   TOTAL SOIL-LOSS VOLUME(ACRE-FEET) =      11.5960
   TOTAL STORM RUNOFF VOLUME(ACRE-FEET) =      10.3020
----------------------------------------------------------------------------
```



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

                    2 4 - H O U R   S T O R M
                  R U N O F F   H Y D R O G R A P H

============================================================================
              HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
       (Note: Time indicated is at END of Each Unit Intervals)
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.        7.5      15.0      22.5      30.0
----------------------------------------------------------------------------
   0.083     0.0003      0.04  Q         .         .         .         .
   0.167     0.0005      0.04  Q         .         .         .         .
   0.250     0.0008      0.04  Q         .         .         .         .
   0.333     0.0019      0.16  Q         .         .         .         .
   0.417     0.0030      0.16  Q         .         .         .         .
   0.500     0.0041      0.16  Q         .         .         .         .
   0.583     0.0058      0.25  Q         .         .         .         .
   0.667     0.0075      0.25  Q         .         .         .         .
   0.750     0.0091      0.25  Q         .         .         .         .
   0.833     0.0112      0.30  Q         .         .         .         .
   0.917     0.0132      0.30  Q         .         .         .         .
   1.000     0.0153      0.30  Q         .         .         .         .
   1.083     0.0176      0.34  Q         .         .         .         .
   1.167     0.0200      0.34  Q         .         .         .         .
   1.250     0.0224      0.34  Q         .         .         .         .
   1.333     0.0246      0.32  Q         .         .         .         .
   1.417     0.0268      0.32  Q         .         .         .         .
   1.500     0.0290      0.32  Q         .         .         .         .
   1.583     0.0312      0.32  Q         .         .         .         .
   1.667     0.0334      0.32  Q         .         .         .         .
   1.750     0.0356      0.32  Q         .         .         .         .
   1.833     0.0379      0.34  Q         .         .         .         .
   1.917     0.0402      0.34  Q         .         .         .         .
   2.000     0.0425      0.34  Q         .         .         .         .
   2.083     0.0452      0.39  Q         .         .         .         .
   2.167     0.0479      0.39  Q         .         .         .         .
   2.250     0.0506      0.39  Q         .         .         .         .
   2.333     0.0534      0.41  Q         .         .         .         .
   2.417     0.0562      0.41  Q         .         .         .         .
   2.500     0.0590      0.41  Q         .         .         .         .
   2.583     0.0619      0.43  Q         .         .         .         .
   2.667     0.0649      0.43  Q         .         .         .         .
   2.750     0.0679      0.43  Q         .         .         .         .
   2.833     0.0713      0.49  Q         .         .         .         .
   2.917     0.0746      0.49  Q         .         .         .         .
   3.000     0.0780      0.49  Q         .         .         .         .
   3.083     0.0815      0.51  Q         .         .         .         .
   3.167     0.0850      0.51  Q         .         .         .         .
   3.250     0.0885      0.51  Q         .         .         .         .
   3.333     0.0920      0.52  Q         .         .         .         .
   3.417     0.0956      0.52  Q         .         .         .         .
   3.500     0.0991      0.52  Q         .         .         .         .
   3.583     0.1027      0.52  Q         .         .         .         .
   3.667     0.1063      0.52  Q         .         .         .         .
   3.750     0.1099      0.52  Q         .         .         .         .
   3.833     0.1137      0.54  Q         .         .         .         .
   3.917     0.1174      0.54  Q         .         .         .         .
```

```
 4.000      0.1212     0.54 Q         .         .         .         .
 4.083      0.1253     0.60 Q         .         .         .         .
 4.167      0.1294     0.60 Q         .         .         .         .
 4.250      0.1335     0.60 Q         .         .         .         .
 4.333      0.1379     0.63 Q         .         .         .         .
 4.417      0.1423     0.63 Q         .         .         .         .
 4.500      0.1466     0.63 Q         .         .         .         .
 4.583      0.1514     0.69 Q         .         .         .         .
 4.667      0.1562     0.69 Q         .         .         .         .
 4.750      0.1610     0.69 Q         .         .         .         .
 4.833      0.1661     0.74 Q         .         .         .         .
 4.917      0.1711     0.74 Q         .         .         .         .
 5.000      0.1762     0.74 Q         .         .         .         .
 5.083      0.1814     0.76 VQ        .         .         .         .
 5.167      0.1866     0.76 VQ        .         .         .         .
 5.250      0.1919     0.76 VQ        .         .         .         .
 5.333      0.1967     0.70 Q         .         .         .         .
 5.417      0.2015     0.70 Q         .         .         .         .
 5.500      0.2063     0.70 Q         .         .         .         .
 5.583      0.2115     0.75 Q         .         .         .         .
 5.667      0.2166     0.75 Q         .         .         .         .
 5.750      0.2217     0.75 Q         .         .         .         .
 5.833      0.2273     0.81 VQ        .         .         .         .
 5.917      0.2328     0.81 VQ        .         .         .         .
 6.000      0.2384     0.81 VQ        .         .         .         .
 6.083      0.2442     0.85 VQ        .         .         .         .
 6.167      0.2500     0.85 VQ        .         .         .         .
 6.250      0.2558     0.85 VQ        .         .         .         .
 6.333      0.2621     0.91 .Q        .         .         .         .
 6.417      0.2683     0.91 .Q        .         .         .         .
 6.500      0.2745     0.91 .Q        .         .         .         .
 6.583      0.2811     0.95 .Q        .         .         .         .
 6.667      0.2876     0.95 .Q        .         .         .         .
 6.750      0.2941     0.95 .Q        .         .         .         .
 6.833      0.3010     1.01 .Q        .         .         .         .
 6.917      0.3080     1.01 .Q        .         .         .         .
 7.000      0.3149     1.01 .Q        .         .         .         .
 7.083      0.3221     1.03 .Q        .         .         .         .
 7.167      0.3292     1.03 .Q        .         .         .         .
 7.250      0.3363     1.03 .Q        .         .         .         .
 7.333      0.3436     1.06 .Q        .         .         .         .
 7.417      0.3509     1.06 .Q        .         .         .         .
 7.500      0.3582     1.06 .Q        .         .         .         .
 7.583      0.3666     1.21 .Q        .         .         .         .
 7.667      0.3750     1.21 .Q        .         .         .         .
 7.750      0.3833     1.21 .Q        .         .         .         .
 7.833      0.3951     1.71 .VQ       .         .         .         .
 7.917      0.4068     1.71 .VQ       .         .         .         .
 8.000      0.4186     1.71 .VQ       .         .         .         .
 8.083      0.4379     2.80 .V Q      .         .         .         .
 8.167      0.4571     2.80 .V Q      .         .         .         .
 8.250      0.4764     2.80 .V Q      .         .         .         .
 8.333      0.5050     4.16 .V   Q    .         .         .         .
 8.417      0.5336     4.16 . V  Q    .         .         .         .
 8.500      0.5623     4.16 . V  Q    .         .         .         .
 8.583      0.5962     4.93 . V   Q   .         .         .         .
 8.667      0.6302     4.93 . V   Q   .         .         .         .
 8.750      0.6641     4.93 . V   Q   .         .         .         .
```



```
 8.833      0.7053     5.98 . V    Q  .         .         .         .
 8.917      0.7465     5.98 . V    Q  .         .         .         .
 9.000      0.7877     5.98 .  V   Q  .         .         .         .
 9.083      0.8380     7.31 .  V     Q.         .         .         .
 9.167      0.8884     7.31 .  V     Q.         .         .         .
 9.250      0.9388     7.31 .  V     Q.         .         .         .
 9.333      1.0007     9.00 .  V      .Q        .         .         .
 9.417      1.0627     9.00 .   V     .Q        .         .         .
 9.500      1.1246     9.00 .   V     .Q        .         .         .
 9.583      1.1959    10.35 .   V     .  Q      .         .         .
 9.667      1.2672    10.35 .   V     .  Q      .         .         .
 9.750      1.3385    10.35 .    V    .  Q      .         .         .
 9.833      1.4185    11.61 .    V    .    Q    .         .         .
 9.917      1.4985    11.61 .    V    .    Q    .         .         .
10.000      1.5785    11.61 .     V   .    Q    .         .         .
10.083      1.6565    11.33 .     V   .    Q    .         .         .
10.167      1.7346    11.33 .     V   .    Q    .         .         .
10.250      1.8126    11.33 .      V  .    Q    .         .         .
10.333      1.8696     8.28 .      V  .Q        .         .         .
10.417      1.9266     8.28 .      V  .Q        .         .         .
10.500      1.9836     8.28 .      V  .Q        .         .         .
10.583      2.0412     8.36 .      V  .Q        .         .         .
10.667      2.0988     8.36 .       V .Q        .         .         .
10.750      2.1564     8.36 .       V .Q        .         .         .
10.833      2.2297    10.65 .       V .   Q     .         .         .
10.917      2.3030    10.65 .       V .   Q     .         .         .
11.000      2.3764    10.65 .        V.   Q     .         .         .
11.083      2.4537    11.22 .        V.   Q     .         .         .
11.167      2.5309    11.22 .        V.   Q     .         .         .
11.250      2.6082    11.22 .         V   Q     .         .         .
11.333      2.6844    11.06 .         V   Q     .         .         .
11.417      2.7606    11.06 .         V   Q     .         .         .
11.500      2.8368    11.06 .          V  Q     .         .         .
```

```
---------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)  Q(CFS)  0.        7.5       15.0      22.5      30.0
---------------------------------------------------------------------------
  11.583     2.9109     10.76  .         .V  Q     .         .         .
  11.667     2.9851     10.76  .         .V  Q     .         .         .
  11.750     3.0592     10.76  .         .V  Q     .         .         .
  11.833     3.1287     10.09  .         . VQ      .         .         .
  11.917     3.1982     10.09  .         . VQ      .         .         .
  12.000     3.2676     10.09  .         . VQ      .         .         .
  12.083     3.3484     11.73  .         .  V Q    .         .         .
  12.167     3.4291     11.73  .         .  V Q    .         .         .
  12.250     3.5099     11.73  .         .  V Q    .         .         .
  12.333     3.6176     15.63  .         .   V     Q         .         .
  12.417     3.7252     15.63  .         .   V     Q         .         .
  12.500     3.8329     15.63  .         .   V     Q         .         .
  12.583     3.9559     17.85  .         .    V    .  Q      .         .
  12.667     4.0788     17.85  .         .    V    .  Q      .         .
  12.750     4.2018     17.85  .         .     V   .  Q      .         .
  12.833     4.3387     19.88  .         .     V   .     Q   .         .
  12.917     4.4757     19.88  .         .      V  .     Q   .         .
  13.000     4.6126     19.88  .         .      V  .     Q   .         .
  13.083     4.7655     22.20  .         .       V .        Q.         .
  13.167     4.9184     22.20  .         .        V.        Q.         .
  13.250     5.0712     22.20  .         .        V.        Q.         .
  13.333     5.2465     25.44  .         .         V         .  Q      .
  13.417     5.4217     25.44  .         .          V        .  Q      .
  13.500     5.5969     25.44  .         .          V        .  Q      .
  13.583     5.7666     24.64  .         .         . V       . Q       .
  13.667     5.9362     24.64  .         .         .  V      . Q       .
  13.750     6.1059     24.64  .         .         .  V      . Q       .
  13.833     6.2414     19.68  .         .         .   V Q   .         .
  13.917     6.3770     19.68  .         .         .   V Q   .         .
  14.000     6.5125     19.68  .         .         .    VQ   .         .
  14.083     6.6434     19.00  .         .         .    Q    .         .
  14.167     6.7742     19.00  .         .         .    QV   .         .
  14.250     6.9050     19.00  .         .         .    QV   .         .
  14.333     7.0452     20.35  .         .         .      Q  .         .
  14.417     7.1854     20.35  .         .         .      Q  .         .
  14.500     7.3255     20.35  .         .         .      QV .         .
  14.583     7.4653     20.29  .         .         .      QV .         .
  14.667     7.6050     20.29  .         .         .      Q V.         .
  14.750     7.7447     20.29  .         .         .      Q  V         .
  14.833     7.8831     20.09  .         .         .     Q   V         .
  14.917     8.0214     20.09  .         .         .     Q    V        .
  15.000     8.1598     20.09  .         .         .     Q    V        .
  15.083     8.2937     19.45  .         .         .    Q    . V       .
  15.167     8.4276     19.45  .         .         .    Q    . V       .
  15.250     8.5616     19.45  .         .         .    Q    .  V      .
  15.333     8.6903     18.69  .         .         .   Q     .  V      .
  15.417     8.8190     18.69  .         .         .   Q     .   V     .
  15.500     8.9477     18.69  .         .         .   Q     .   V     .
  15.583     9.0665     17.26  .         .         .  Q      .    V    .
  15.667     9.1854     17.26  .         .         .  Q      .    V    .
  15.750     9.3042     17.26  .         .         .  Q      .     V   .
  15.833     9.4075     15.00  .         .         Q         .     V   .
  15.917     9.5108     15.00  .         .         Q         .     V   .
  16.000     9.6142     15.00  .         .         Q         .      V  .
  16.083     9.6963     11.92  .         .    Q    .         .      V  .
```



```
  16.167     9.7783     11.92  .         .    Q    .         .      V  .
  16.250     9.8604     11.92  .         .    Q    .         .       V .
  16.333     9.8970      5.31  .      Q  .         .         .       V .
  16.417     9.9336      5.31  .      Q  .         .         .       V .
  16.500     9.9702      5.31  .      Q  .         .         .       V .
  16.583     9.9907      2.98  .  Q      .         .         .       V .
  16.667    10.0112      2.98  .  Q      .         .         .       V .
  16.750    10.0317      2.98  .  Q      .         .         .       V .
  16.833    10.0446      1.87  . Q       .         .         .        V.
  16.917    10.0575      1.87  . Q       .         .         .        V.
  17.000    10.0705      1.87  . Q       .         .         .        V.
  17.083    10.0793      1.28  .Q        .         .         .        V.
  17.167    10.0881      1.28  .Q        .         .         .        V.
  17.250    10.0969      1.28  .Q        .         .         .        V.
  17.333    10.1037      0.99  .Q        .         .         .        V.
  17.417    10.1105      0.99  .Q        .         .         .        V.
  17.500    10.1172      0.99  .Q        .         .         .        V.
  17.583    10.1226      0.77  .Q        .         .         .        V.
  17.667    10.1279      0.77  .Q        .         .         .        V.
  17.750    10.1333      0.77  .Q        .         .         .        V.
  17.833    10.1378      0.65  Q         .         .         .        V.
  17.917    10.1423      0.65  Q         .         .         .        V.
  18.000    10.1468      0.65  Q         .         .         .        V.
  18.083    10.1504      0.53  Q         .         .         .        V.
  18.167    10.1540      0.53  Q         .         .         .        V.
  18.250    10.1576      0.53  Q         .         .         .        V.
  18.333    10.1608      0.47  Q         .         .         .        V.
  18.417    10.1640      0.47  Q         .         .         .        V.
  18.500    10.1673      0.47  Q         .         .         .        V.
  18.583    10.1701      0.42  Q         .         .         .        V.
  18.667    10.1730      0.42  Q         .         .         .        V.
  18.750    10.1759      0.42  Q         .         .         .        V.
  18.833    10.1783      0.34  Q         .         .         .        V.
  18.917    10.1806      0.34  Q         .         .         .        V.
  19.000    10.1829      0.34  Q         .         .         .        V.
  19.083    10.1849      0.29  Q         .         .         .        V.
  19.167    10.1869      0.29  Q         .         .         .        V.
  19.250    10.1889      0.29  Q         .         .         .        V.
  19.333    10.1912      0.33  Q         .         .         .        V.
  19.417    10.1934      0.33  Q         .         .         .        V.
  19.500    10.1957      0.33  Q         .         .         .        V.
  19.583    10.1983      0.37  Q         .         .         .        V.
  19.667    10.2008      0.37  Q         .         .         .        V.
  19.750    10.2034      0.37  Q         .         .         .        V.
  19.833    10.2055      0.32  Q         .         .         .        V.
  19.917    10.2077      0.32  Q         .         .         .        V.
  20.000    10.2099      0.32  Q         .         .         .        V.
  20.083    10.2118      0.27  Q         .         .         .        V.
  20.167    10.2137      0.27  Q         .         .         .        V.
  20.250    10.2156      0.27  Q         .         .         .        V.
  20.333    10.2176      0.30  Q         .         .         .        V.
  20.417    10.2197      0.30  Q         .         .         .        V.
  20.500    10.2218      0.30  Q         .         .         .        V.
  20.583    10.2240      0.31  Q         .         .         .        V.
  20.667    10.2262      0.31  Q         .         .         .        V.
  20.750    10.2283      0.31  Q         .         .         .        V.
  20.833    10.2304      0.30  Q         .         .         .        V.
  20.917    10.2324      0.30  Q         .         .         .        V.
```

```
  21.000     10.2344      0.30  Q         .         .         .        V.
  21.083     10.2362      0.26  Q         .         .         .        V.
  21.167     10.2381      0.26  Q         .         .         .        V.
  21.250     10.2399      0.26  Q         .         .         .        V.
  21.333     10.2418      0.28  Q         .         .         .        V.
  21.417     10.2437      0.28  Q         .         .         .        V.
  21.500     10.2457      0.28  Q         .         .         .        V.
  21.583     10.2475      0.26  Q         .         .         .        V.
  21.667     10.2492      0.26  Q         .         .         .        V.
  21.750     10.2510      0.26  Q         .         .         .        V.
  21.833     10.2529      0.28  Q         .         .         .        V.
  21.917     10.2548      0.28  Q         .         .         .        V.
  22.000     10.2567      0.28  Q         .         .         .        V.
  22.083     10.2585      0.26  Q         .         .         .        V.
  22.167     10.2603      0.26  Q         .         .         .        V.
  22.250     10.2620      0.26  Q         .         .         .        V.
  22.333     10.2639      0.28  Q         .         .         .        V.
  22.417     10.2658      0.28  Q         .         .         .        V.
  22.500     10.2677      0.28  Q         .         .         .        V.
  22.583     10.2693      0.24  Q         .         .         .        V.
  22.667     10.2710      0.24  Q         .         .         .        V.
  22.750     10.2726      0.24  Q         .         .         .        V.
  22.833     10.2741      0.22  Q         .         .         .        V.
  22.917     10.2757      0.22  Q         .         .         .        V.
  23.000     10.2772      0.22  Q         .         .         .        V.
  23.083     10.2787      0.22  Q         .         .         .        V.
  23.166     10.2802      0.22  Q         .         .         .        V.
  23.250     10.2817      0.22  Q         .         .         .        V.
  23.333     10.2832      0.22  Q         .         .         .        V.
  23.416     10.2847      0.22  Q         .         .         .        V.
  23.500     10.2862      0.22  Q         .         .         .        V.
  23.583     10.2877      0.21  Q         .         .         .        V.
  23.666     10.2892      0.21  Q         .         .         .        V.
  23.750     10.2906      0.21  Q         .         .         .        V.
  23.833     10.2921      0.21  Q         .         .         .        V.
  23.916     10.2936      0.21  Q         .         .         .        V.
  24.000     10.2950      0.21  Q         .         .         .        V.
```



```
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.        7.5      15.0      22.5      30.0
----------------------------------------------------------------------------
  24.083     10.2962      0.17  Q         .         .         .        V.
  24.166     10.2975      0.17  Q         .         .         .        V.
  24.250     10.2987      0.17  Q         .         .         .        V.
  24.333     10.2992      0.07  Q         .         .         .        V.
  24.416     10.2996      0.07  Q         .         .         .        V.
  24.500     10.3001      0.07  Q         .         .         .        V.
  24.583     10.3004      0.04  Q         .         .         .        V.
  24.666     10.3007      0.04  Q         .         .         .        V.
  24.750     10.3009      0.04  Q         .         .         .        V.
  24.833     10.3011      0.02  Q         .         .         .        V.
  24.916     10.3012      0.02  Q         .         .         .        V.
  25.000     10.3014      0.02  Q         .         .         .        V.
  25.083     10.3015      0.01  Q         .         .         .        V.
  25.166     10.3015      0.01  Q         .         .         .        V.
  25.250     10.3016      0.01  Q         .         .         .        V.
  25.333     10.3017      0.01  Q         .         .         .        V.
  25.416     10.3017      0.01  Q         .         .         .        V.
  25.500     10.3018      0.01  Q         .         .         .        V.
-------------------------------------------------------------------------------
   TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
   (Note: 100% of Peak Flow Rate estimate assumed to have
   an instantaneous time duration)

   Percentile of Estimated                Duration
       Peak Flow Rate                     (minutes)
   =======================                =========
             0%                             1530.0
            10%                              525.0
            20%                              465.0
            30%                              420.0
            40%                              360.0
            50%                              225.0
            60%                              210.0
            70%                              180.0
            80%                               45.0
            90%                               30.0
============================================================================

  END OF FLOODSCx ROUTING ANALYSIS
```

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

          F L O O D    R O U T I N G    A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                  (RCFC&WCD) 1978 HYDROLOGY MANUAL
         (c) Copyright 1989-2013 Advanced Engineering Software (aes)
                 (Synthetic Unit Hydrograph Version 20.0)
                 Release Date: 06/01/2013  License ID 1264

                         Analysis prepared by:



 ************************* DESCRIPTION OF STUDY *************************
* MEAD VALLEY BUSINESS PARK                                              *
* PRELIMINARY PROPOSED CONDITION HYDROGRAPH DEVELOPMENT WATERSHED B-9AA    *
* 10 YEAR - 24 HOUR STORM - 15 MIN INTERVAL AMC II                       *
 ************************************************************************

  FILE NAME: P10_B9AA.DAT
  TIME/DATE OF STUDY: 15:58 07/03/2019
```



```
****************************************************************************
  FLOW PROCESS FROM NODE    900.00 TO NODE    919.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =      21.300 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.174 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.104
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.900
         MINIMUM SOIL-LOSS RATE(INCH/HOUR) =   0.052
         USER-ENTERED RAINFALL =  3.10 INCHES
         RCFC&WCD 24-Hour Storm (15-Minute period) SELECTED
         RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 1.0000


         UNIT HYDROGRAPH TIME UNIT =  15.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME = 143.926


============================================================================
                      UNIT HYDROGRAPH DETERMINATION

----------------------------------------------------------------------------
    INTERVAL           "S" GRAPH          UNIT HYDROGRAPH
     NUMBER           MEAN VALUES          ORDINATES(CFS)
----------------------------------------------------------------------------
        1                31.544               27.086
        2                79.127               40.857
        3                90.580                9.834
        4                95.714                4.408
        5                98.210                2.144
        6                99.250                0.893
        7                99.700                0.386
        8                99.925                0.193
        9               100.000                0.064


----------------------------------------------------------------------------

         TOTAL STORM RAINFALL(INCHES) =  3.10
         TOTAL SOIL-LOSS(INCHES) =  1.62
         TOTAL EFFECTIVE RAINFALL(INCHES) =  1.48

----------------------------------------------------------------------------
    TOTAL SOIL-LOSS VOLUME(ACRE-FEET) =       2.8722
    TOTAL STORM RUNOFF VOLUME(ACRE-FEET) =       2.6287
----------------------------------------------------------------------------
```

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

                        2 4 - H O U R   S T O R M
                      R U N O F F   H Y D R O G R A P H

==============================================================================
              HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
      (Note: Time indicated is at END of Each Unit Intervals)
------------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.         2.5       5.0       7.5      10.0
------------------------------------------------------------------------------
    0.083     0.0001     0.02  Q          .         .         .         .
    0.167     0.0002     0.02  Q          .         .         .         .
    0.250     0.0003     0.02  Q          .         .         .         .
    0.333     0.0007     0.05  Q          .         .         .         .
    0.417     0.0010     0.05  Q          .         .         .         .
    0.500     0.0014     0.05  Q          .         .         .         .
    0.583     0.0019     0.07  Q          .         .         .         .
    0.667     0.0023     0.07  Q          .         .         .         .
    0.750     0.0028     0.07  Q          .         .         .         .
    0.833     0.0034     0.08  Q          .         .         .         .
    0.917     0.0040     0.08  Q          .         .         .         .
    1.000     0.0045     0.08  Q          .         .         .         .
    1.083     0.0052     0.09  Q          .         .         .         .
    1.167     0.0058     0.09  Q          .         .         .         .
    1.250     0.0064     0.09  Q          .         .         .         .
    1.333     0.0070     0.08  Q          .         .         .         .
    1.417     0.0075     0.08  Q          .         .         .         .
    1.500     0.0081     0.08  Q          .         .         .         .
    1.583     0.0087     0.08  Q          .         .         .         .
    1.667     0.0092     0.08  Q          .         .         .         .
    1.750     0.0098     0.08  Q          .         .         .         .
    1.833     0.0104     0.09  Q          .         .         .         .
    1.917     0.0110     0.09  Q          .         .         .         .
    2.000     0.0116     0.09  Q          .         .         .         .
    2.083     0.0123     0.10  Q          .         .         .         .
    2.167     0.0130     0.10  Q          .         .         .         .
    2.250     0.0137     0.10  Q          .         .         .         .
    2.333     0.0144     0.10  Q          .         .         .         .
    2.417     0.0151     0.10  Q          .         .         .         .
    2.500     0.0159     0.10  Q          .         .         .         .
    2.583     0.0166     0.11  Q          .         .         .         .
    2.667     0.0174     0.11  Q          .         .         .         .
    2.750     0.0182     0.11  Q          .         .         .         .
    2.833     0.0191     0.13  Q          .         .         .         .
    2.917     0.0200     0.13  Q          .         .         .         .
    3.000     0.0208     0.13  Q          .         .         .         .
    3.083     0.0217     0.13  Q          .         .         .         .
    3.167     0.0226     0.13  Q          .         .         .         .
    3.250     0.0235     0.13  Q          .         .         .         .
    3.333     0.0244     0.13  Q          .         .         .         .
    3.417     0.0253     0.13  Q          .         .         .         .
    3.500     0.0263     0.13  Q          .         .         .         .
    3.583     0.0272     0.13  Q          .         .         .         .
    3.667     0.0281     0.13  Q          .         .         .         .
    3.750     0.0290     0.13  Q          .         .         .         .
    3.833     0.0300     0.14  Q          .         .         .         .
    3.917     0.0309     0.14  Q          .         .         .         .
```

```
 4.000     0.0319     0.14  Q         .         .         .         .
 4.083     0.0330     0.15  Q         .         .         .         .
 4.167     0.0340     0.15  Q         .         .         .         .
 4.250     0.0351     0.15  Q         .         .         .         .
 4.333     0.0362     0.17  Q         .         .         .         .
 4.417     0.0374     0.17  Q         .         .         .         .
 4.500     0.0385     0.17  Q         .         .         .         .
 4.583     0.0397     0.18  Q         .         .         .         .
 4.667     0.0410     0.18  Q         .         .         .         .
 4.750     0.0422     0.18  Q         .         .         .         .
 4.833     0.0435     0.19  Q         .         .         .         .
 4.917     0.0449     0.19  Q         .         .         .         .
 5.000     0.0462     0.19  Q         .         .         .         .
 5.083     0.0475     0.19  Q         .         .         .         .
 5.167     0.0488     0.19  Q         .         .         .         .
 5.250     0.0501     0.19  Q         .         .         .         .
 5.333     0.0513     0.18  Q         .         .         .         .
 5.417     0.0525     0.18  Q         .         .         .         .
 5.500     0.0537     0.18  Q         .         .         .         .
 5.583     0.0551     0.19  Q         .         .         .         .
 5.667     0.0564     0.19  Q         .         .         .         .
 5.750     0.0577     0.19  Q         .         .         .         .
 5.833     0.0591     0.21  Q         .         .         .         .
 5.917     0.0606     0.21  Q         .         .         .         .
 6.000     0.0620     0.21  Q         .         .         .         .
 6.083     0.0635     0.22  Q         .         .         .         .
 6.167     0.0650     0.22  Q         .         .         .         .
 6.250     0.0665     0.22  QV        .         .         .         .
 6.333     0.0681     0.23  QV        .         .         .         .
 6.417     0.0697     0.23  QV        .         .         .         .
 6.500     0.0713     0.23  QV        .         .         .         .
 6.583     0.0730     0.24  QV        .         .         .         .
 6.667     0.0747     0.24  QV        .         .         .         .
 6.750     0.0764     0.24  QV        .         .         .         .
 6.833     0.0782     0.26  .Q        .         .         .         .
 6.917     0.0799     0.26  .Q        .         .         .         .
 7.000     0.0817     0.26  .Q        .         .         .         .
 7.083     0.0835     0.26  .Q        .         .         .         .
 7.167     0.0853     0.26  .Q        .         .         .         .
 7.250     0.0872     0.26  .Q        .         .         .         .
 7.333     0.0890     0.27  .Q        .         .         .         .
 7.417     0.0909     0.27  .Q        .         .         .         .
 7.500     0.0928     0.27  .Q        .         .         .         .
 7.583     0.0952     0.35  .Q        .         .         .         .
 7.667     0.0976     0.35  .Q        .         .         .         .
 7.750     0.1001     0.35  .Q        .         .         .         .
 7.833     0.1038     0.55  .VQ       .         .         .         .
 7.917     0.1076     0.55  .VQ       .         .         .         .
 8.000     0.1114     0.55  .VQ       .         .         .         .
 8.083     0.1175     0.90  .V Q      .         .         .         .
 8.167     0.1237     0.90  .V Q      .         .         .         .
 8.250     0.1299     0.90  .V Q      .         .         .         .
 8.333     0.1383     1.22  . V Q     .         .         .         .
 8.417     0.1467     1.22  . V Q     .         .         .         .
 8.500     0.1552     1.22  . V Q     .         .         .         .
 8.583     0.1650     1.42  . V  Q    .         .         .         .
 8.667     0.1748     1.42  . V  Q    .         .         .         .
 8.750     0.1846     1.42  . V  Q    .         .         .         .
```



```
 8.833     0.1963     1.71  . V   Q   .         .         .         .
 8.917     0.2081     1.71  .  V  Q   .         .         .         .
 9.000     0.2198     1.71  .  V  Q   .         .         .         .
 9.083     0.2342     2.08  .  V    Q .         .         .         .
 9.167     0.2485     2.08  .  V    Q .         .         .         .
 9.250     0.2628     2.08  .  V    Q .         .         .         .
 9.333     0.2801     2.51  .   V     Q         .         .         .
 9.417     0.2974     2.51  .   V     Q         .         .         .
 9.500     0.3147     2.51  .   V     Q         .         .         .
 9.583     0.3342     2.84  .    V    .Q        .         .         .
 9.667     0.3538     2.84  .    V    .Q        .         .         .
 9.750     0.3733     2.84  .    V    .Q        .         .         .
 9.833     0.3950     3.15  .     V   . Q       .         .         .
 9.917     0.4167     3.15  .     V   . Q       .         .         .
10.000     0.4384     3.15  .     V   . Q       .         .         .
10.083     0.4576     2.79  .     V   .Q        .         .         .
10.167     0.4768     2.79  .      V  .Q        .         .         .
10.250     0.4960     2.79  .      V  .Q        .         .         .
10.333     0.5098     1.99  .      Q  .         .         .         .
10.417     0.5235     1.99  .      Q  .         .         .         .
10.500     0.5372     1.99  .      QV .         .         .         .
10.583     0.5528     2.26  .       VQ.         .         .         .
10.667     0.5683     2.26  .       VQ.         .         .         .
10.750     0.5839     2.26  .       VQ.         .         .         .
10.833     0.6035     2.84  .        V.Q        .         .         .
10.917     0.6231     2.84  .        V.Q        .         .         .
11.000     0.6427     2.84  .        V.Q        .         .         .
11.083     0.6627     2.90  .         VQ       .         .         .
11.167     0.6827     2.90  .         VQ       .         .         .
11.250     0.7027     2.90  .         VQ       .         .         .
11.333     0.7224     2.86  .         VQ       .         .         .
11.417     0.7421     2.86  .          Q       .         .         .
11.500     0.7618     2.86  .          Q       .         .         .
```

```
-----------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.         2.5        5.0        7.5        10.0
-----------------------------------------------------------------------
  11.583     0.7805     2.72  .         QV        .         .         .
  11.667     0.7992     2.72  .         Q V       .         .         .
  11.750     0.8180     2.72  .         Q V       .         .         .
  11.833     0.8358     2.58  .         Q V       .         .         .
  11.917     0.8535     2.58  .         Q V       .         .         .
  12.000     0.8713     2.58  .         Q  V      .         .         .
  12.083     0.8938     3.26  .         .  Q      .         .         .
  12.167     0.9162     3.26  .         .  Q      .         .         .
  12.250     0.9387     3.26  .         .  QV     .         .         .
  12.333     0.9681     4.27  .         .   V  Q  .         .         .
  12.417     0.9975     4.27  .         .    V Q  .         .         .
  12.500     1.0269     4.27  .         .    V Q  .         .         .
  12.583     1.0600     4.81  .         .     V  Q.         .         .
  12.667     1.0931     4.81  .         .     V  Q.         .         .
  12.750     1.1263     4.81  .         .      V Q.         .         .
  12.833     1.1628     5.30  .         .      V  .Q        .         .
  12.917     1.1993     5.30  .         .       V .Q        .         .
  13.000     1.2358     5.30  .         .       V .Q        .         .
  13.083     1.2772     6.00  .         .        V.   Q     .         .
  13.167     1.3185     6.00  .         .         V   Q     .         .
  13.250     1.3598     6.00  .         .         V   Q     .         .
  13.333     1.4063     6.75  .         .         .V    Q   .         .
  13.417     1.4528     6.75  .         .         . V   Q   .         .
  13.500     1.4992     6.75  .         .         . V   Q   .         .
  13.583     1.5409     6.05  .         .         .  VQ     .         .
  13.667     1.5825     6.05  .         .         .   Q     .         .
  13.750     1.6241     6.05  .         .         .   Q     .         .
  13.833     1.6570     4.77  .         .        Q.    V    .         .
  13.917     1.6898     4.77  .         .        Q.    V    .         .
  14.000     1.7226     4.77  .         .        Q.     V   .         .
  14.083     1.7560     4.84  .         .        Q.     V   .         .
  14.167     1.7893     4.84  .         .        Q.      V  .         .
  14.250     1.8226     4.84  .         .        Q.      V  .         .
  14.333     1.8581     5.15  .         .         Q       V .         .
  14.417     1.8936     5.15  .         .         Q       V .         .
  14.500     1.9291     5.15  .         .         Q        V.         .
  14.583     1.9643     5.11  .         .         Q        V.         .
  14.667     1.9995     5.11  .         .         Q         V         .
  14.750     2.0347     5.11  .         .         Q         V         .
  14.833     2.0695     5.05  .         .         Q         .V        .
  14.917     2.1043     5.05  .         .         Q         . V       .
  15.000     2.1391     5.05  .         .         Q         . V       .
  15.083     2.1726     4.87  .         .        Q.         .  V      .
  15.167     2.2062     4.87  .         .        Q.         .  V      .
  15.250     2.2397     4.87  .         .        Q.         .   V     .
  15.333     2.2718     4.65  .         .       Q .         .   V     .
  15.417     2.3038     4.65  .         .       Q .         .    V    .
  15.500     2.3359     4.65  .         .       Q .         .    V    .
  15.583     2.3646     4.17  .         .     Q   .         .    V    .
  15.667     2.3934     4.17  .         .     Q   .         .     V   .
  15.750     2.4221     4.17  .         .     Q   .         .     V   .
  15.833     2.4472     3.64  .         .   Q     .         .      V  .
  15.917     2.4723     3.64  .         .   Q     .         .      V  .
  16.000     2.4974     3.64  .         .   Q     .         .       V .
  16.083     2.5144     2.48  .        Q.         .         .       V .
```



```
  16.167     2.5315     2.48  .        Q.         .         .        V .
  16.250     2.5485     2.48  .        Q.         .         .        V .
  16.333     2.5543     0.84  .  Q      .         .         .        V .
  16.417     2.5601     0.84  .  Q      .         .         .        V .
  16.500     2.5660     0.84  .  Q      .         .         .         V.
  16.583     2.5689     0.43  .Q        .         .         .         V.
  16.667     2.5719     0.43  .Q        .         .         .         V.
  16.750     2.5748     0.43  .Q        .         .         .         V.
  16.833     2.5764     0.24  Q         .         .         .         V.
  16.917     2.5781     0.24  Q         .         .         .         V.
  17.000     2.5797     0.24  Q         .         .         .         V.
  17.083     2.5808     0.16  Q         .         .         .         V.
  17.167     2.5819     0.16  Q         .         .         .         V.
  17.250     2.5830     0.16  Q         .         .         .         V.
  17.333     2.5840     0.15  Q         .         .         .         V.
  17.417     2.5851     0.15  Q         .         .         .         V.
  17.500     2.5861     0.15  Q         .         .         .         V.
  17.583     2.5870     0.14  Q         .         .         .         V.
  17.667     2.5880     0.14  Q         .         .         .         V.
  17.750     2.5889     0.14  Q         .         .         .         V.
  17.833     2.5898     0.13  Q         .         .         .         V.
  17.917     2.5907     0.13  Q         .         .         .         V.
  18.000     2.5915     0.13  Q         .         .         .         V.
  18.083     2.5923     0.11  Q         .         .         .         V.
  18.167     2.5931     0.11  Q         .         .         .         V.
  18.250     2.5938     0.11  Q         .         .         .         V.
  18.333     2.5946     0.11  Q         .         .         .         V.
  18.417     2.5953     0.11  Q         .         .         .         V.
  18.500     2.5961     0.11  Q         .         .         .         V.
  18.583     2.5968     0.10  Q         .         .         .         V.
  18.667     2.5974     0.10  Q         .         .         .         V.
  18.750     2.5981     0.10  Q         .         .         .         V.
  18.833     2.5986     0.08  Q         .         .         .         V.
  18.917     2.5992     0.08  Q         .         .         .         V.
  19.000     2.5997     0.08  Q         .         .         .         V.
  19.083     2.6002     0.07  Q         .         .         .         V.
  19.167     2.6007     0.07  Q         .         .         .         V.
  19.250     2.6012     0.07  Q         .         .         .         V.
  19.333     2.6018     0.09  Q         .         .         .         V.
  19.417     2.6023     0.09  Q         .         .         .         V.
  19.500     2.6029     0.09  Q         .         .         .         V.
  19.583     2.6036     0.09  Q         .         .         .         V.
  19.667     2.6042     0.09  Q         .         .         .         V.
  19.750     2.6048     0.09  Q         .         .         .         V.
  19.833     2.6053     0.07  Q         .         .         .         V.
  19.917     2.6059     0.07  Q         .         .         .         V.
  20.000     2.6064     0.07  Q         .         .         .         V.
  20.083     2.6068     0.07  Q         .         .         .         V.
  20.167     2.6073     0.07  Q         .         .         .         V.
  20.250     2.6078     0.07  Q         .         .         .         V.
  20.333     2.6083     0.08  Q         .         .         .         V.
  20.417     2.6088     0.08  Q         .         .         .         V.
  20.500     2.6094     0.08  Q         .         .         .         V.
  20.583     2.6099     0.08  Q         .         .         .         V.
  20.667     2.6105     0.08  Q         .         .         .         V.
  20.750     2.6110     0.08  Q         .         .         .         V.
  20.833     2.6115     0.07  Q         .         .         .         V.
  20.917     2.6120     0.07  Q         .         .         .         V.
```

```
21.000     2.6125     0.07  Q         .         .         .        V.
21.083     2.6129     0.07  Q         .         .         .        V.
21.167     2.6134     0.07  Q         .         .         .        V.
21.250     2.6139     0.07  Q         .         .         .        V.
21.333     2.6143     0.07  Q         .         .         .        V.
21.417     2.6148     0.07  Q         .         .         .        V.
21.500     2.6153     0.07  Q         .         .         .        V.
21.583     2.6157     0.07  Q         .         .         .        V.
21.667     2.6162     0.07  Q         .         .         .        V.
21.750     2.6166     0.07  Q         .         .         .        V.
21.833     2.6171     0.07  Q         .         .         .        V.
21.917     2.6176     0.07  Q         .         .         .        V.
22.000     2.6180     0.07  Q         .         .         .        V.
22.083     2.6185     0.07  Q         .         .         .        V.
22.167     2.6189     0.07  Q         .         .         .        V.
22.250     2.6194     0.07  Q         .         .         .        V.
22.333     2.6198     0.07  Q         .         .         .        V.
22.417     2.6203     0.07  Q         .         .         .        V.
22.500     2.6208     0.07  Q         .         .         .        V.
22.583     2.6212     0.06  Q         .         .         .        V.
22.667     2.6216     0.06  Q         .         .         .        V.
22.750     2.6220     0.06  Q         .         .         .        V.
22.833     2.6223     0.05  Q         .         .         .        V.
22.917     2.6227     0.05  Q         .         .         .        V.
23.000     2.6231     0.05  Q         .         .         .        V.
23.083     2.6235     0.05  Q         .         .         .        V.
23.166     2.6238     0.05  Q         .         .         .        V.
23.250     2.6242     0.05  Q         .         .         .        V.
23.333     2.6246     0.05  Q         .         .         .        V.
23.416     2.6249     0.05  Q         .         .         .        V.
23.500     2.6253     0.05  Q         .         .         .        V.
23.583     2.6257     0.05  Q         .         .         .        V.
23.666     2.6260     0.05  Q         .         .         .        V.
23.750     2.6264     0.05  Q         .         .         .        V.
23.833     2.6268     0.05  Q         .         .         .        V.
23.916     2.6271     0.05  Q         .         .         .        V.
24.000     2.6275     0.05  Q         .         .         .        V.
```



```
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.        2.5       5.0       7.5       10.0
----------------------------------------------------------------------------
  24.083      2.6278      0.04  Q         .         .         .        V.
  24.166      2.6280      0.04  Q         .         .         .        V.
  24.250      2.6283      0.04  Q         .         .         .        V.
  24.333      2.6283      0.01  Q         .         .         .        V.
  24.416      2.6284      0.01  Q         .         .         .        V.
  24.500      2.6285      0.01  Q         .         .         .        V.
  24.583      2.6285      0.01  Q         .         .         .        V.
  24.666      2.6286      0.01  Q         .         .         .        V.
  24.750      2.6286      0.01  Q         .         .         .        V.
-------------------------------------------------------------------------------
   TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
   (Note: 100% of Peak Flow Rate estimate assumed to have
   an instantaneous time duration)

   Percentile of Estimated               Duration
       Peak Flow Rate                    (minutes)
   =======================               =========
              0%                          1485.0
             10%                           510.0
             20%                           465.0
             30%                           420.0
             40%                           345.0
             50%                           225.0
             60%                           210.0
             70%                           165.0
             80%                            45.0
             90%                            15.0
============================================================================

  END OF FLOODSCx ROUTING ANALYSIS
```

TOTAL SOIL-LOSS VOLUME(ACRE-FEET) = 10.0873
TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 8.2477

24-HOUR STORM
RUNOFF HYDROGRAPH

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	7.5	15.0	22.5	30.0
0.083	0.0002	0.03	Q	.	.	.	.
0.167	0.0003	0.03	Q	.	.	.	.
0.250	0.0005	0.03	Q	.	.	.	.
0.333	0.0013	0.12	Q	.	.	.	.
0.417	0.0022	0.12	Q	.	.	.	.
0.500	0.0030	0.12	Q	.	.	.	.
0.583	0.0043	0.19	Q	.	.	.	.
0.667	0.0057	0.19	Q	.	.	.	.
0.750	0.0070	0.19	Q	.	.	.	.
0.833	0.0086	0.24	Q	.	.	.	.
0.917	0.0103	0.24	Q	.	.	.	.
1.000	0.0119	0.24	Q	.	.	.	.
1.083	0.0138	0.28	Q	.	.	.	.
1.167	0.0158	0.28	Q	.	.	.	.
1.250	0.0177	0.28	Q	.	.	.	.
1.333	0.0195	0.27	Q	.	.	.	.
1.417	0.0214	0.27	Q	.	.	.	.
1.500	0.0232	0.27	Q	.	.	.	.
1.583	0.0250	0.26	Q	.	.	.	.
1.667	0.0268	0.26	Q	.	.	.	.
1.750	0.0286	0.26	Q	.	.	.	.
1.833	0.0305	0.28	Q	.	.	.	.
1.917	0.0324	0.28	Q	.	.	.	.
2.000	0.0343	0.28	Q	.	.	.	.
2.083	0.0365	0.32	Q	.	.	.	.
2.167	0.0387	0.32	Q	.	.	.	.
2.250	0.0409	0.32	Q	.	.	.	.
2.333	0.0432	0.34	Q	.	.	.	.
2.417	0.0455	0.34	Q	.	.	.	.
2.500	0.0479	0.34	Q	.	.	.	.
2.583	0.0503	0.36	Q	.	.	.	.
2.667	0.0528	0.36	Q	.	.	.	.
2.750	0.0552	0.36	Q	.	.	.	.
2.833	0.0580	0.40	Q	.	.	.	.
2.917	0.0607	0.40	Q	.	.	.	.
3.000	0.0635	0.40	Q	.	.	.	.
3.083	0.0664	0.42	Q	.	.	.	.
3.167	0.0693	0.42	Q	.	.	.	.
3.250	0.0722	0.42	Q	.	.	.	.
3.333	0.0752	0.43	Q	.	.	.	.
3.417	0.0781	0.43	Q	.	.	.	.
3.500	0.0811	0.43	Q	.	.	.	.
3.583	0.0841	0.43	Q	.	.	.	.
3.667	0.0871	0.43	Q	.	.	.	.
3.750	0.0901	0.43	Q	.	.	.	.
3.833	0.0932	0.45	Q	.	.	.	.
3.917	0.0963	0.45	Q	.	.	.	.

```
 4.000    0.0994    0.45  Q         .         .         .         .
 4.083    0.1028    0.49  Q         .         .         .         .
 4.167    0.1062    0.49  Q         .         .         .         .
 4.250    0.1096    0.49  Q         .         .         .         .
 4.333    0.1132    0.52  Q         .         .         .         .
 4.417    0.1168    0.52  Q         .         .         .         .
 4.500    0.1204    0.52  Q         .         .         .         .
 4.583    0.1244    0.57  Q         .         .         .         .
 4.667    0.1283    0.57  Q         .         .         .         .
 4.750    0.1322    0.57  Q         .         .         .         .
 4.833    0.1364    0.61  Q         .         .         .         .
 4.917    0.1406    0.61  Q         .         .         .         .
 5.000    0.1448    0.61  Q         .         .         .         .
 5.083    0.1491    0.63  Q         .         .         .         .
 5.167    0.1535    0.63  Q         .         .         .         .
 5.250    0.1579    0.63  Q         .         .         .         .
 5.333    0.1619    0.59  Q         .         .         .         .
 5.417    0.1659    0.59  Q         .         .         .         .
 5.500    0.1700    0.59  Q         .         .         .         .
 5.583    0.1742    0.62  Q         .         .         .         .
 5.667    0.1785    0.62  Q         .         .         .         .
 5.750    0.1827    0.62  Q         .         .         .         .
 5.833    0.1873    0.67  Q         .         .         .         .
 5.917    0.1919    0.67  Q         .         .         .         .
 6.000    0.1965    0.67  Q         .         .         .         .
 6.083    0.2014    0.70  Q         .         .         .         .
 6.167    0.2062    0.70  Q         .         .         .         .
 6.250    0.2110    0.70  QV        .         .         .         .
 6.333    0.2162    0.75  QV        .         .         .         .
 6.417    0.2213    0.75  QV        .         .         .         .
 6.500    0.2265    0.75  QV        .         .         .         .
 6.583    0.2319    0.78  .Q        .         .         .         .
 6.667    0.2373    0.78  .Q        .         .         .         .
 6.750    0.2427    0.78  .Q        .         .         .         .
 6.833    0.2484    0.83  .Q        .         .         .         .
 6.917    0.2542    0.83  .Q        .         .         .         .
 7.000    0.2599    0.83  .Q        .         .         .         .
 7.083    0.2658    0.86  .Q        .         .         .         .
 7.167    0.2718    0.86  .Q        .         .         .         .
 7.250    0.2777    0.86  .Q        .         .         .         .
 7.333    0.2837    0.88  .Q        .         .         .         .
 7.417    0.2898    0.88  .Q        .         .         .         .
 7.500    0.2959    0.88  .Q        .         .         .         .
 7.583    0.3024    0.94  .Q        .         .         .         .
 7.667    0.3089    0.94  .Q        .         .         .         .
 7.750    0.3153    0.94  .Q        .         .         .         .
 7.833    0.3229    1.10  .Q        .         .         .         .
 7.917    0.3305    1.10  .Q        .         .         .         .
 8.000    0.3381    1.10  .Q        .         .         .         .
 8.083    0.3499    1.72  .VQ       .         .         .         .
 8.167    0.3617    1.72  .VQ       .         .         .         .
 8.250    0.3736    1.72  .VQ       .         .         .         .
 8.333    0.3925    2.76  .V Q      .         .         .         .
 8.417    0.4115    2.76  .V Q      .         .         .         .
 8.500    0.4305    2.76  . VQ      .         .         .         .
 8.583    0.4538    3.39  . V Q     .         .         .         .
 8.667    0.4771    3.39  . V Q     .         .         .         .
 8.750    0.5004    3.39  . V Q     .         .         .         .
```



```
 8.833    0.5294    4.21  . V  Q    .         .         .         .
 8.917    0.5584    4.21  . V  Q    .         .         .         .
 9.000    0.5875    4.21  . V  Q    .         .         .         .
 9.083    0.6238    5.27  .  V   Q  .         .         .         .
 9.167    0.6600    5.27  .  V   Q  .         .         .         .
 9.250    0.6963    5.27  .  V   Q  .         .         .         .
 9.333    0.7421    6.64  .  V    Q .         .         .         .
 9.417    0.7879    6.64  .  V    Q .         .         .         .
 9.500    0.8336    6.64  .   V   Q .         .         .         .
 9.583    0.8873    7.80  .   V     Q         .         .         .
 9.667    0.9410    7.80  .   V     Q         .         .         .
 9.750    0.9947    7.80  .   V     Q         .         .         .
 9.833    1.0558    8.86  .    V    .Q        .         .         .
 9.917    1.1168    8.86  .    V    .Q        .         .         .
10.000    1.1779    8.86  .    V    .Q        .         .         .
10.083    1.2391    8.89  .     V   .Q        .         .         .
10.167    1.3003    8.89  .     V   .Q        .         .         .
10.250    1.3616    8.89  .     V   .Q        .         .         .
10.333    1.4066    6.54  .     V Q .         .         .         .
10.417    1.4517    6.54  .      VQ .         .         .         .
10.500    1.4967    6.54  .      VQ .         .         .         .
10.583    1.5403    6.33  .      VQ .         .         .         .
10.667    1.5839    6.33  .      VQ .         .         .         .
10.750    1.6275    6.33  .      VQ .         .         .         .
10.833    1.6834    8.13  .       V Q         .         .         .
10.917    1.7394    8.13  .       V Q         .         .         .
11.000    1.7954    8.13  .       V Q         .         .         .
11.083    1.8557    8.75  .       V .Q        .         .         .
11.167    1.9159    8.75  .        V.Q        .         .         .
11.250    1.9762    8.75  .        V.Q        .         .         .
11.333    2.0360    8.68  .        V.Q        .         .         .
11.417    2.0958    8.68  .         VQ        .         .         .
11.500    2.1555    8.68  .         VQ        .         .         .
```

```
 ---------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.       7.5       15.0      22.5      30.0
 ---------------------------------------------------------------------------
 11.583      2.2140      8.49  .         VQ        .         .         .
 11.667      2.2724      8.49  .          Q        .         .         .
 11.750      2.3308      8.49  .          Q        .         .         .
 11.833      2.3854      7.92  .         QV        .         .         .
 11.917      2.4399      7.92  .         QV        .         .         .
 12.000      2.4944      7.92  .         Q V       .         .         .
 12.083      2.5565      9.02  .         . Q       .         .         .
 12.167      2.6186      9.02  .         . Q       .         .         .
 12.250      2.6808      9.02  .         . QV      .         .         .
 12.333      2.7644     12.15  .         .  V  Q   .         .         .
 12.417      2.8481     12.15  .         .  V  Q   .         .         .
 12.500      2.9317     12.15  .         .   V Q   .         .         .
 12.583      3.0286     14.07  .         .   V   Q .         .         .
 12.667      3.1255     14.07  .         .    V  Q .         .         .
 12.750      3.2224     14.07  .         .    V  Q .         .         .
 12.833      3.3311     15.77  .         .     V   .Q        .         .
 12.917      3.4397     15.77  .         .     V   .Q        .         .
 13.000      3.5484     15.77  .         .      V  .Q        .         .
 13.083      3.6697     17.62  .         .      V  .  Q      .         .
 13.167      3.7910     17.62  .         .       V .  Q      .         .
 13.250      3.9124     17.62  .         .       V .  Q      .         .
 13.333      4.0522     20.30  .         .        V.      Q  .         .
 13.417      4.1920     20.30  .         .         V      Q  .         .
 13.500      4.3319     20.30  .         .          V     Q  .         .
 13.583      4.4708     20.17  .         .         .V    Q   .         .
 13.667      4.6096     20.17  .         .         . V   Q   .         .
 13.750      4.7485     20.17  .         .         .  V  Q   .         .
 13.833      4.8610     16.33  .         .         .Q V      .         .
 13.917      4.9735     16.33  .         .         .Q  V     .         .
 14.000      5.0859     16.33  .         .         .Q  V     .         .
 14.083      5.1921     15.42  .         .         Q    V    .         .
 14.167      5.2984     15.42  .         .         Q    V    .         .
 14.250      5.4046     15.42  .         .         Q     V   .         .
 14.333      5.5181     16.48  .         .         .Q    V   .         .
 14.417      5.6316     16.48  .         .         .Q     V  .         .
 14.500      5.7451     16.48  .         .         .Q     V  .         .
 14.583      5.8590     16.54  .         .         . Q     V .         .
 14.667      5.9730     16.54  .         .         . Q     V .         .
 14.750      6.0869     16.54  .         .         . Q      V.         .
 14.833      6.2000     16.43  .         .         .Q        V         .
 14.917      6.3131     16.43  .         .         .Q        V         .
 15.000      6.4263     16.43  .         .         .Q         V        .
 15.083      6.5360     15.93  .         .         .Q        .V        .
 15.167      6.6457     15.93  .         .         .Q        . V       .
 15.250      6.7554     15.93  .         .         .Q        . V       .
 15.333      6.8607     15.30  .         .         Q         .  V      .
 15.417      6.9660     15.30  .         .         Q         .  V      .
 15.500      7.0714     15.30  .         .         Q         .   V     .
 15.583      7.1695     14.25  .         .       Q .         .   V     .
 15.667      7.2676     14.25  .         .       Q .         .    V    .
 15.750      7.3658     14.25  .         .       Q .         .    V    .
 15.833      7.4513     12.42  .         .     Q   .         .     V   .
 15.917      7.5368     12.42  .         .     Q   .         .     V   .
 16.000      7.6223     12.42  .         .     Q   .         .     V   .
 16.083      7.6924     10.18  .         .  Q      .         .      V  .
```



```
 16.167      7.7625     10.18  .         .  Q      .         .      V  .
 16.250      7.8326     10.18  .         .  Q      .         .      V  .
 16.333      7.8674      5.05  .     Q   .         .         .       V .
 16.417      7.9021      5.05  .     Q   .         .         .       V .
 16.500      7.9369      5.05  .     Q   .         .         .       V .
 16.583      7.9567      2.87  .  Q      .         .         .       V .
 16.667      7.9765      2.87  .  Q      .         .         .       V .
 16.750      7.9963      2.87  .  Q      .         .         .       V .
 16.833      8.0092      1.88  . Q       .         .         .       V .
 16.917      8.0222      1.88  . Q       .         .         .       V .
 17.000      8.0351      1.88  . Q       .         .         .       V .
 17.083      8.0442      1.32  .Q        .         .         .        V.
 17.167      8.0533      1.32  .Q        .         .         .        V.
 17.250      8.0624      1.32  .Q        .         .         .        V.
 17.333      8.0694      1.02  .Q        .         .         .        V.
 17.417      8.0764      1.02  .Q        .         .         .        V.
 17.500      8.0834      1.02  .Q        .         .         .        V.
 17.583      8.0889      0.80  .Q        .         .         .        V.
 17.667      8.0944      0.80  .Q        .         .         .        V.
 17.750      8.0998      0.80  .Q        .         .         .        V.
 17.833      8.1042      0.63  Q         .         .         .        V.
 17.917      8.1086      0.63  Q         .         .         .        V.
 18.000      8.1129      0.63  Q         .         .         .        V.
 18.083      8.1165      0.52  Q         .         .         .        V.
 18.167      8.1200      0.52  Q         .         .         .        V.
 18.250      8.1236      0.52  Q         .         .         .        V.
 18.333      8.1266      0.44  Q         .         .         .        V.
 18.417      8.1296      0.44  Q         .         .         .        V.
 18.500      8.1326      0.44  Q         .         .         .        V.
 18.583      8.1352      0.38  Q         .         .         .        V.
 18.667      8.1378      0.38  Q         .         .         .        V.
 18.750      8.1404      0.38  Q         .         .         .        V.
 18.833      8.1424      0.30  Q         .         .         .        V.
 18.917      8.1445      0.30  Q         .         .         .        V.
 19.000      8.1466      0.30  Q         .         .         .        V.
 19.083      8.1483      0.25  Q         .         .         .        V.
 19.167      8.1500      0.25  Q         .         .         .        V.
 19.250      8.1517      0.25  Q         .         .         .        V.
 19.333      8.1536      0.28  Q         .         .         .        V.
 19.417      8.1554      0.28  Q         .         .         .        V.
 19.500      8.1573      0.28  Q         .         .         .        V.
 19.583      8.1595      0.31  Q         .         .         .        V.
 19.667      8.1616      0.31  Q         .         .         .        V.
 19.750      8.1637      0.31  Q         .         .         .        V.
 19.833      8.1656      0.27  Q         .         .         .        V.
 19.917      8.1675      0.27  Q         .         .         .        V.
 20.000      8.1693      0.27  Q         .         .         .        V.
 20.083      8.1709      0.23  Q         .         .         .        V.
 20.167      8.1725      0.23  Q         .         .         .        V.
 20.250      8.1741      0.23  Q         .         .         .        V.
 20.333      8.1759      0.25  Q         .         .         .        V.
 20.417      8.1776      0.25  Q         .         .         .        V.
 20.500      8.1794      0.25  Q         .         .         .        V.
 20.583      8.1812      0.26  Q         .         .         .        V.
 20.667      8.1830      0.26  Q         .         .         .        V.
 20.750      8.1848      0.26  Q         .         .         .        V.
 20.833      8.1865      0.25  Q         .         .         .        V.
 20.917      8.1883      0.25  Q         .         .         .        V.
```

```
 21.000      8.1900      0.25  Q          .          .          .        V.
 21.083      8.1915      0.22  Q          .          .          .        V.
 21.167      8.1931      0.22  Q          .          .          .        V.
 21.250      8.1946      0.22  Q          .          .          .        V.
 21.333      8.1962      0.24  Q          .          .          .        V.
 21.417      8.1978      0.24  Q          .          .          .        V.
 21.500      8.1995      0.24  Q          .          .          .        V.
 21.583      8.2010      0.22  Q          .          .          .        V.
 21.667      8.2025      0.22  Q          .          .          .        V.
 21.750      8.2040      0.22  Q          .          .          .        V.
 21.833      8.2056      0.23  Q          .          .          .        V.
 21.917      8.2072      0.23  Q          .          .          .        V.
 22.000      8.2088      0.23  Q          .          .          .        V.
 22.083      8.2102      0.22  Q          .          .          .        V.
 22.167      8.2117      0.22  Q          .          .          .        V.
 22.250      8.2132      0.22  Q          .          .          .        V.
 22.333      8.2148      0.23  Q          .          .          .        V.
 22.417      8.2164      0.23  Q          .          .          .        V.
 22.500      8.2180      0.23  Q          .          .          .        V.
 22.583      8.2194      0.20  Q          .          .          .        V.
 22.667      8.2208      0.20  Q          .          .          .        V.
 22.750      8.2221      0.20  Q          .          .          .        V.
 22.833      8.2234      0.19  Q          .          .          .        V.
 22.917      8.2247      0.19  Q          .          .          .        V.
 23.000      8.2261      0.19  Q          .          .          .        V.
 23.083      8.2273      0.18  Q          .          .          .        V.
 23.166      8.2286      0.18  Q          .          .          .        V.
 23.250      8.2299      0.18  Q          .          .          .        V.
 23.333      8.2311      0.18  Q          .          .          .        V.
 23.416      8.2324      0.18  Q          .          .          .        V.
 23.500      8.2336      0.18  Q          .          .          .        V.
 23.583      8.2349      0.18  Q          .          .          .        V.
 23.666      8.2361      0.18  Q          .          .          .        V.
 23.750      8.2374      0.18  Q          .          .          .        V.
 23.833      8.2386      0.18  Q          .          .          .        V.
 23.916      8.2398      0.18  Q          .          .          .        V.
 24.000      8.2411      0.18  Q          .          .          .        V.
```



```
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS) 0.        7.5       15.0       22.5       30.0
----------------------------------------------------------------------------
  24.083      8.2421      0.15  Q          .          .          .        V.
  24.166      8.2432      0.15  Q          .          .          .        V.
  24.250      8.2442      0.15  Q          .          .          .        V.
  24.333      8.2447      0.07  Q          .          .          .        V.
  24.416      8.2452      0.07  Q          .          .          .        V.
  24.500      8.2457      0.07  Q          .          .          .        V.
  24.583      8.2460      0.04  Q          .          .          .        V.
  24.666      8.2462      0.04  Q          .          .          .        V.
  24.750      8.2465      0.04  Q          .          .          .        V.
  24.833      8.2466      0.02  Q          .          .          .        V.
  24.916      8.2468      0.02  Q          .          .          .        V.
  25.000      8.2469      0.02  Q          .          .          .        V.
  25.083      8.2471      0.01  Q          .          .          .        V.
  25.166      8.2472      0.01  Q          .          .          .        V.
  25.250      8.2473      0.01  Q          .          .          .        V.
  25.333      8.2473      0.01  Q          .          .          .        V.
  25.416      8.2474      0.01  Q          .          .          .        V.
  25.500      8.2475      0.01  Q          .          .          .        V.
-------------------------------------------------------------------------------
   TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
   (Note: 100% of Peak Flow Rate estimate assumed to have
   an instantaneous time duration)

   Percentile of Estimated                Duration
       Peak Flow Rate                     (minutes)
   =======================                =========
              0%                            1530.0
             10%                             510.0
             20%                             465.0
             30%                             420.0
             40%                             345.0
             50%                             240.0
             60%                             210.0
             70%                             180.0
             80%                             105.0
             90%                              30.0
============================================================================

  END OF FLOODSCx ROUTING ANALYSIS
```

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

          F L O O D     R O U T I N G     A N A L Y S I S

ACCORDING TO RIVERSIDE COUNTY FLOOD CONTORL AND WATER CONSERVATION DISTRICT
                 (RCFC&WCD) 1978 HYDROLOGY MANUAL
       (c) Copyright 1989-2013 Advanced Engineering Software (aes)
             (Synthetic Unit Hydrograph Version 20.0)
             Release Date: 06/01/2013  License ID 1264

                      Analysis prepared by:

 ************************** DESCRIPTION OF STUDY **************************
* MEAD VALLEY BUSINESS PARK                                                 *
* PRELIMINARY EXISTING CONDITION HYDROGRAPH DEVELOPMENT WATERSHED B-9AA     *
* 10 YEAR - 24 HOUR STORM - 15 MIN INTERVAL AMC II                          *
 **************************************************************************

  FILE NAME: E10_B9AA.DAT
  TIME/DATE OF STUDY: 15:44 07/03/2019
```



```
****************************************************************************
  FLOW PROCESS FROM NODE    900.00 TO NODE    908.00 IS CODE =   1
----------------------------------------------------------------------------
  >>>>>SUBAREA RUNOFF (UNIT-HYDROGRAPH ANALYSIS)<<<<<
============================================================================

      (UNIT-HYDROGRAPH ADDED TO STREAM #1)

         WATERSHED AREA =      34.700 ACRES
         BASEFLOW =   0.000 CFS/SQUARE-MILE
         *USER ENTERED "LAG" TIME =    0.236 HOURS
          CAUTION: LAG TIME IS LESS THAN 0.50 HOURS.
          THE 5-MINUTE PERIOD UH MODEL (USED IN THIS COMPUTER PROGRAM)
          MAY BE TOO LARGE FOR PEAK FLOW ESTIMATES.
         VALLEY S-GRAPH SELECTED
         UNIFORM MEAN SOIL-LOSS(INCH/HOUR) =  0.115
         LOW SOIL-LOSS RATE PERCENT(DECIMAL) = 0.900
         MINIMUM SOIL-LOSS RATE(INCH/HOUR) =   0.058
         USER-ENTERED RAINFALL =  3.10 INCHES
         RCFC&WCD 24-Hour Storm (15-Minute period) SELECTED
         RCFC&WCD DEPTH-AREA ADJUSTMENT FACTOR(PLATE E-5.8) = 0.9999

         UNIT HYDROGRAPH TIME UNIT =  15.000 MINUTES
         UNIT INTERVAL PERCENTAGE OF LAG-TIME = 106.067

============================================================================
                      UNIT HYDROGRAPH DETERMINATION
----------------------------------------------------------------------------
```

INTERVAL NUMBER	"S" GRAPH MEAN VALUES	UNIT HYDROGRAPH ORDINATES(CFS)
1	20.886	29.216
2	69.734	68.331
3	84.630	20.837
4	91.212	9.208
5	95.065	5.389
6	97.426	3.303
7	98.563	1.590
8	99.297	1.027
9	99.719	0.590
10	99.930	0.295
11	100.000	0.098

```
----------------------------------------------------------------------------

         TOTAL STORM RAINFALL(INCHES) =  3.10
         TOTAL SOIL-LOSS(INCHES) =  1.70
         TOTAL EFFECTIVE RAINFALL(INCHES) =  1.39

----------------------------------------------------------------------------
    TOTAL SOIL-LOSS VOLUME(ACRE-FEET) =      4.9302
```

TOTAL STORM RUNOFF VOLUME(ACRE-FEET) = 4.0314

24-HOUR STORM
RUNOFF HYDROGRAPH

HYDROGRAPH IN FIVE-MINUTE UNIT INTERVALS(CFS)
(Note: Time indicated is at END of Each Unit Intervals)

TIME(HRS)	VOLUME(AF)	Q(CFS)	0.	5.0	10.0	15.0	20.0
0.083	0.0001	0.02	Q	.	.	.	.
0.167	0.0002	0.02	Q	.	.	.	.
0.250	0.0004	0.02	Q	.	.	.	.
0.333	0.0009	0.07	Q	.	.	.	.
0.417	0.0013	0.07	Q	.	.	.	.
0.500	0.0018	0.07	Q	.	.	.	.
0.583	0.0025	0.10	Q	.	.	.	.
0.667	0.0032	0.10	Q	.	.	.	.
0.750	0.0040	0.10	Q	.	.	.	.
0.833	0.0048	0.12	Q	.	.	.	.
0.917	0.0057	0.12	Q	.	.	.	.
1.000	0.0065	0.12	Q	.	.	.	.
1.083	0.0075	0.14	Q	.	.	.	.
1.167	0.0085	0.14	Q	.	.	.	.
1.250	0.0095	0.14	Q	.	.	.	.
1.333	0.0104	0.13	Q	.	.	.	.
1.417	0.0113	0.13	Q	.	.	.	.
1.500	0.0122	0.13	Q	.	.	.	.
1.583	0.0131	0.13	Q	.	.	.	.
1.667	0.0140	0.13	Q	.	.	.	.
1.750	0.0149	0.13	Q	.	.	.	.
1.833	0.0159	0.14	Q	.	.	.	.
1.917	0.0168	0.14	Q	.	.	.	.
2.000	0.0178	0.14	Q	.	.	.	.
2.083	0.0189	0.16	Q	.	.	.	.
2.167	0.0200	0.16	Q	.	.	.	.
2.250	0.0211	0.16	Q	.	.	.	.
2.333	0.0223	0.17	Q	.	.	.	.
2.417	0.0234	0.17	Q	.	.	.	.
2.500	0.0246	0.17	Q	.	.	.	.
2.583	0.0258	0.18	Q	.	.	.	.
2.667	0.0270	0.18	Q	.	.	.	.
2.750	0.0283	0.18	Q	.	.	.	.
2.833	0.0297	0.20	Q	.	.	.	.
2.917	0.0311	0.20	Q	.	.	.	.
3.000	0.0324	0.20	Q	.	.	.	.
3.083	0.0339	0.21	Q	.	.	.	.
3.167	0.0353	0.21	Q	.	.	.	.
3.250	0.0368	0.21	Q	.	.	.	.
3.333	0.0382	0.21	Q	.	.	.	.
3.417	0.0397	0.21	Q	.	.	.	.
3.500	0.0412	0.21	Q	.	.	.	.
3.583	0.0426	0.21	Q	.	.	.	.
3.667	0.0441	0.21	Q	.	.	.	.
3.750	0.0456	0.21	Q	.	.	.	.
3.833	0.0471	0.22	Q	.	.	.	.
3.917	0.0487	0.22	Q	.	.	.	.

```
 4.000     0.0502     0.22  Q         .         .         .         .
 4.083     0.0519     0.25  Q         .         .         .         .
 4.167     0.0536     0.25  Q         .         .         .         .
 4.250     0.0553     0.25  Q         .         .         .         .
 4.333     0.0571     0.26  Q         .         .         .         .
 4.417     0.0589     0.26  Q         .         .         .         .
 4.500     0.0607     0.26  Q         .         .         .         .
 4.583     0.0627     0.29  Q         .         .         .         .
 4.667     0.0647     0.29  Q         .         .         .         .
 4.750     0.0666     0.29  Q         .         .         .         .
 4.833     0.0687     0.30  Q         .         .         .         .
 4.917     0.0708     0.30  Q         .         .         .         .
 5.000     0.0729     0.30  Q         .         .         .         .
 5.083     0.0751     0.31  Q         .         .         .         .
 5.167     0.0772     0.31  Q         .         .         .         .
 5.250     0.0793     0.31  Q         .         .         .         .
 5.333     0.0813     0.29  Q         .         .         .         .
 5.417     0.0833     0.29  Q         .         .         .         .
 5.500     0.0853     0.29  Q         .         .         .         .
 5.583     0.0874     0.31  Q         .         .         .         .
 5.667     0.0895     0.31  Q         .         .         .         .
 5.750     0.0916     0.31  Q         .         .         .         .
 5.833     0.0939     0.33  Q         .         .         .         .
 5.917     0.0962     0.33  Q         .         .         .         .
 6.000     0.0985     0.33  Q         .         .         .         .
 6.083     0.1009     0.35  QV        .         .         .         .
 6.167     0.1033     0.35  QV        .         .         .         .
 6.250     0.1057     0.35  QV        .         .         .         .
 6.333     0.1082     0.37  QV        .         .         .         .
 6.417     0.1108     0.37  QV        .         .         .         .
 6.500     0.1134     0.37  QV        .         .         .         .
 6.583     0.1161     0.39  QV        .         .         .         .
 6.667     0.1187     0.39  QV        .         .         .         .
 6.750     0.1214     0.39  QV        .         .         .         .
 6.833     0.1243     0.42  QV        .         .         .         .
 6.917     0.1271     0.42  QV        .         .         .         .
 7.000     0.1300     0.42  QV        .         .         .         .
 7.083     0.1329     0.42  QV        .         .         .         .
 7.167     0.1359     0.42  QV        .         .         .         .
 7.250     0.1388     0.42  QV        .         .         .         .
 7.333     0.1418     0.44  QV        .         .         .         .
 7.417     0.1448     0.44  QV        .         .         .         .
 7.500     0.1478     0.44  QV        .         .         .         .
 7.583     0.1510     0.47  QV        .         .         .         .
 7.667     0.1543     0.47  QV        .         .         .         .
 7.750     0.1575     0.47  QV        .         .         .         .
 7.833     0.1614     0.57  .Q        .         .         .         .
 7.917     0.1654     0.57  .Q        .         .         .         .
 8.000     0.1693     0.57  .Q        .         .         .         .
 8.083     0.1757     0.94  .Q        .         .         .         .
 8.167     0.1822     0.94  .Q        .         .         .         .
 8.250     0.1887     0.94  .Q        .         .         .         .
 8.333     0.1987     1.46  .VQ       .         .         .         .
 8.417     0.2088     1.46  . Q       .         .         .         .
 8.500     0.2189     1.46  . Q       .         .         .         .
 8.583     0.2310     1.76  . VQ      .         .         .         .
 8.667     0.2431     1.76  . VQ      .         .         .         .
 8.750     0.2553     1.76  . VQ      .         .         .         .
```



```
 8.833     0.2704     2.20  . V Q     .         .         .         .
 8.917     0.2855     2.20  . V Q     .         .         .         .
 9.000     0.3007     2.20  . V Q     .         .         .         .
 9.083     0.3196     2.76  .  V Q    .         .         .         .
 9.167     0.3386     2.76  .  V Q    .         .         .         .
 9.250     0.3576     2.76  .  V Q    .         .         .         .
 9.333     0.3814     3.45  .  V  Q   .         .         .         .
 9.417     0.4052     3.45  .   V Q   .         .         .         .
 9.500     0.4289     3.45  .   V Q   .         .         .         .
 9.583     0.4565     4.00  .   V   Q .         .         .         .
 9.667     0.4841     4.00  .   V   Q .         .         .         .
 9.750     0.5117     4.00  .    V  Q .         .         .         .
 9.833     0.5428     4.53  .    V   Q.         .         .         .
 9.917     0.5740     4.53  .    V   Q.         .         .         .
10.000     0.6052     4.53  .     V  Q.         .         .         .
10.083     0.6349     4.31  .     V Q .         .         .         .
10.167     0.6645     4.31  .     V Q .         .         .         .
10.250     0.6942     4.31  .     V Q .         .         .         .
10.333     0.7151     3.03  .     QV  .         .         .         .
10.417     0.7360     3.03  .     QV  .         .         .         .
10.500     0.7569     3.03  .     QV  .         .         .         .
10.583     0.7787     3.16  .     QV  .         .         .         .
10.667     0.8005     3.16  .     QV  .         .         .         .
10.750     0.8222     3.16  .     Q V .         .         .         .
10.833     0.8507     4.13  .       Q .         .         .         .
10.917     0.8791     4.13  .       Q .         .         .         .
11.000     0.9075     4.13  .       QV.         .         .         .
11.083     0.9373     4.32  .       QV.         .         .         .
11.167     0.9670     4.32  .       QV.         .         .         .
11.250     0.9968     4.32  .       QV.         .         .         .
11.333     1.0261     4.25  .       Q V       .         .         .
11.417     1.0554     4.25  .       Q V       .         .         .
11.500     1.0847     4.25  .       Q V       .         .         .
```

```
-------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)  Q(CFS)  0.        5.0       10.0      15.0      20.0
-------------------------------------------------------------------------
  11.583     1.1131     4.12   .       Q .V        .         .         .
  11.667     1.1415     4.12   .       Q .V        .         .         .
  11.750     1.1699     4.12   .       Q .V        .         .         .
  11.833     1.1964     3.85   .      Q  .V        .         .         .
  11.917     1.2230     3.85   .      Q  . V       .         .         .
  12.000     1.2495     3.85   .      Q  . V       .         .         .
  12.083     1.2813     4.62   .        Q. V       .         .         .
  12.167     1.3131     4.62   .        Q.  V      .         .         .
  12.250     1.3450     4.62   .        Q.  V      .         .         .
  12.333     1.3881     6.26   .         . QV      .         .         .
  12.417     1.4312     6.26   .         . Q V     .         .         .
  12.500     1.4743     6.26   .         . Q V     .         .         .
  12.583     1.5236     7.16   .         .   QV    .         .         .
  12.667     1.5729     7.16   .         .   QV    .         .         .
  12.750     1.6222     7.16   .         .   Q V   .         .         .
  12.833     1.6772     7.99   .         .    QV   .         .         .
  12.917     1.7322     7.99   .         .    Q V  .         .         .
  13.000     1.7873     7.99   .         .    Q V  .         .         .
  13.083     1.8491     8.98   .         .      QV .         .         .
  13.167     1.9110     8.98   .         .      QV .         .         .
  13.250     1.9729     8.98   .         .      Q V.         .         .
  13.333     2.0439    10.30   .         .         Q         .         .
  13.417     2.1148    10.30   .         .         Q         .         .
  13.500     2.1858    10.30   .         .         QV        .         .
  13.583     2.2532     9.79   .         .        Q. V       .         .
  13.667     2.3207     9.79   .         .        Q.  V      .         .
  13.750     2.3881     9.79   .         .        Q.  V      .         .
  13.833     2.4413     7.72   .         .    Q    .   V     .         .
  13.917     2.4944     7.72   .         .    Q    .   V     .         .
  14.000     2.5476     7.72   .         .    Q    .    V    .         .
  14.083     2.5996     7.55   .         .    Q    .    V    .         .
  14.167     2.6515     7.55   .         .    Q    .     V   .         .
  14.250     2.7035     7.55   .         .    Q    .     V   .         .
  14.333     2.7594     8.11   .         .     Q   .      V  .         .
  14.417     2.8152     8.11   .         .     Q   .      V  .         .
  14.500     2.8711     8.11   .         .     Q   .       V .         .
  14.583     2.9266     8.06   .         .     Q   .        V.         .
  14.667     2.9821     8.06   .         .     Q   .        V.         .
  14.750     3.0376     8.06   .         .     Q   .         V         .
  14.833     3.0925     7.97   .         .    Q    .         V         .
  14.917     3.1474     7.97   .         .    Q    .          V        .
  15.000     3.2023     7.97   .         .    Q    .          V        .
  15.083     3.2555     7.72   .         .    Q    .         . V       .
  15.167     3.3086     7.72   .         .    Q    .         . V       .
  15.250     3.3618     7.72   .         .    Q    .         .  V      .
  15.333     3.4127     7.39   .         .   Q     .         .  V      .
  15.417     3.4636     7.39   .         .   Q     .         .   V     .
  15.500     3.5145     7.39   .         .   Q     .         .   V     .
  15.583     3.5611     6.76   .         .  Q      .         .    V    .
  15.667     3.6077     6.76   .         .  Q      .         .    V    .
  15.750     3.6542     6.76   .         .  Q      .         .     V   .
  15.833     3.6945     5.85   .         .Q        .         .     V   .
  15.917     3.7348     5.85   .         .Q        .         .      V  .
  16.000     3.7751     5.85   .         .Q        .         .      V  .
  16.083     3.8062     4.51   .        Q.         .         .      V  .
```



```
  16.167     3.8373     4.51   .        Q.         .         .       V .
  16.250     3.8683     4.51   .        Q.         .         .       V .
  16.333     3.8814     1.89   .  Q      .         .         .       V .
  16.417     3.8944     1.89   .  Q      .         .         .       V .
  16.500     3.9074     1.89   .  Q      .         .         .       V .
  16.583     3.9146     1.05   . Q       .         .         .       V .
  16.667     3.9218     1.05   . Q       .         .         .       V .
  16.750     3.9290     1.05   . Q       .         .         .       V .
  16.833     3.9334     0.64   .Q        .         .         .        V.
  16.917     3.9378     0.64   .Q        .         .         .        V.
  17.000     3.9423     0.64   .Q        .         .         .        V.
  17.083     3.9453     0.43   Q         .         .         .        V.
  17.167     3.9482     0.43   Q         .         .         .        V.
  17.250     3.9512     0.43   Q         .         .         .        V.
  17.333     3.9536     0.34   Q         .         .         .        V.
  17.417     3.9559     0.34   Q         .         .         .        V.
  17.500     3.9582     0.34   Q         .         .         .        V.
  17.583     3.9602     0.28   Q         .         .         .        V.
  17.667     3.9621     0.28   Q         .         .         .        V.
  17.750     3.9641     0.28   Q         .         .         .        V.
  17.833     3.9657     0.24   Q         .         .         .        V.
  17.917     3.9673     0.24   Q         .         .         .        V.
  18.000     3.9690     0.24   Q         .         .         .        V.
  18.083     3.9703     0.20   Q         .         .         .        V.
  18.167     3.9717     0.20   Q         .         .         .        V.
  18.250     3.9731     0.20   Q         .         .         .        V.
  18.333     3.9743     0.18   Q         .         .         .        V.
  18.417     3.9756     0.18   Q         .         .         .        V.
  18.500     3.9768     0.18   Q         .         .         .        V.
  18.583     3.9780     0.17   Q         .         .         .        V.
  18.667     3.9791     0.17   Q         .         .         .        V.
  18.750     3.9803     0.17   Q         .         .         .        V.
  18.833     3.9812     0.14   Q         .         .         .        V.
  18.917     3.9821     0.14   Q         .         .         .        V.
  19.000     3.9831     0.14   Q         .         .         .        V.
  19.083     3.9839     0.12   Q         .         .         .        V.
  19.167     3.9847     0.12   Q         .         .         .        V.
  19.250     3.9855     0.12   Q         .         .         .        V.
  19.333     3.9864     0.14   Q         .         .         .        V.
  19.417     3.9874     0.14   Q         .         .         .        V.
  19.500     3.9883     0.14   Q         .         .         .        V.
  19.583     3.9893     0.15   Q         .         .         .        V.
  19.667     3.9904     0.15   Q         .         .         .        V.
  19.750     3.9914     0.15   Q         .         .         .        V.
  19.833     3.9923     0.13   Q         .         .         .        V.
  19.917     3.9932     0.13   Q         .         .         .        V.
  20.000     3.9941     0.13   Q         .         .         .        V.
  20.083     3.9948     0.11   Q         .         .         .        V.
  20.167     3.9956     0.11   Q         .         .         .        V.
  20.250     3.9964     0.11   Q         .         .         .        V.
  20.333     3.9972     0.13   Q         .         .         .        V.
  20.417     3.9981     0.13   Q         .         .         .        V.
  20.500     3.9989     0.13   Q         .         .         .        V.
  20.583     3.9998     0.13   Q         .         .         .        V.
  20.667     4.0007     0.13   Q         .         .         .        V.
  20.750     4.0016     0.13   Q         .         .         .        V.
  20.833     4.0024     0.12   Q         .         .         .        V.
  20.917     4.0032     0.12   Q         .         .         .        V.
```

```
 21.000      4.0041      0.12  Q        .         .         .        V.
 21.083      4.0048      0.11  Q        .         .         .        V.
 21.167      4.0055      0.11  Q        .         .         .        V.
 21.250      4.0063      0.11  Q        .         .         .        V.
 21.333      4.0071      0.11  Q        .         .         .        V.
 21.417      4.0079      0.11  Q        .         .         .        V.
 21.500      4.0087      0.11  Q        .         .         .        V.
 21.583      4.0094      0.11  Q        .         .         .        V.
 21.667      4.0101      0.11  Q        .         .         .        V.
 21.750      4.0108      0.11  Q        .         .         .        V.
 21.833      4.0116      0.11  Q        .         .         .        V.
 21.917      4.0124      0.11  Q        .         .         .        V.
 22.000      4.0132      0.11  Q        .         .         .        V.
 22.083      4.0139      0.10  Q        .         .         .        V.
 22.167      4.0146      0.10  Q        .         .         .        V.
 22.250      4.0153      0.10  Q        .         .         .        V.
 22.333      4.0161      0.11  Q        .         .         .        V.
 22.417      4.0169      0.11  Q        .         .         .        V.
 22.500      4.0177      0.11  Q        .         .         .        V.
 22.583      4.0183      0.10  Q        .         .         .        V.
 22.667      4.0190      0.10  Q        .         .         .        V.
 22.750      4.0196      0.10  Q        .         .         .        V.
 22.833      4.0203      0.09  Q        .         .         .        V.
 22.917      4.0209      0.09  Q        .         .         .        V.
 23.000      4.0215      0.09  Q        .         .         .        V.
 23.083      4.0221      0.09  Q        .         .         .        V.
 23.166      4.0227      0.09  Q        .         .         .        V.
 23.250      4.0234      0.09  Q        .         .         .        V.
 23.333      4.0240      0.09  Q        .         .         .        V.
 23.416      4.0246      0.09  Q        .         .         .        V.
 23.500      4.0252      0.09  Q        .         .         .        V.
 23.583      4.0258      0.09  Q        .         .         .        V.
 23.666      4.0264      0.09  Q        .         .         .        V.
 23.750      4.0270      0.09  Q        .         .         .        V.
 23.833      4.0276      0.09  Q        .         .         .        V.
 23.916      4.0282      0.09  Q        .         .         .        V.
 24.000      4.0288      0.09  Q        .         .         .        V.
```

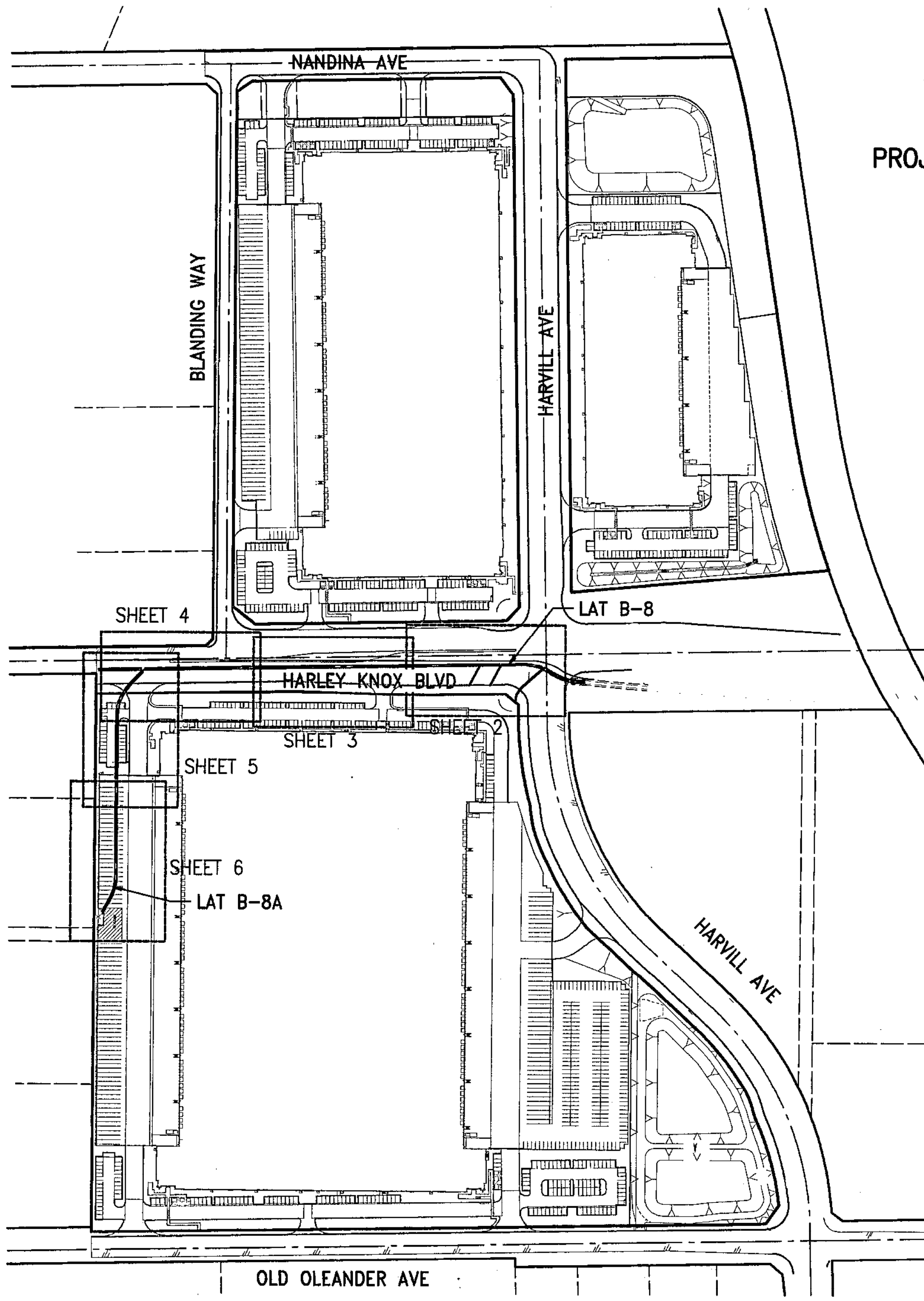


```
----------------------------------------------------------------------------
 TIME(HRS) VOLUME(AF)   Q(CFS)  0.        5.0      10.0      15.0      20.0
----------------------------------------------------------------------------
  24.083      4.0293      0.07  Q        .         .         .        V.
  24.166      4.0297      0.07  Q        .         .         .        V.
  24.250      4.0302      0.07  Q        .         .         .        V.
  24.333      4.0304      0.03  Q        .         .         .        V.
  24.416      4.0306      0.03  Q        .         .         .        V.
  24.500      4.0307      0.03  Q        .         .         .        V.
  24.583      4.0308      0.01  Q        .         .         .        V.
  24.666      4.0309      0.01  Q        .         .         .        V.
  24.750      4.0310      0.01  Q        .         .         .        V.
  24.833      4.0311      0.01  Q        .         .         .        V.
  24.916      4.0311      0.01  Q        .         .         .        V.
  25.000      4.0312      0.01  Q        .         .         .        V.
-------------------------------------------------------------------------------
   TIME DURATION(minutes) OF PERCENTILES OF ESTIMATED PEAK FLOW RATE:
   (Note: 100% of Peak Flow Rate estimate assumed to have
   an instantaneous time duration)

   Percentile of Estimated                Duration
       Peak Flow Rate                     (minutes)
   =======================                =========
             0%                            1500.0
            10%                             510.0
            20%                             450.0
            30%                             405.0
            40%                             345.0
            50%                             225.0
            60%                             210.0
            70%                             165.0
            80%                              45.0
            90%                              30.0
============================================================================

  END OF FLOODSCx ROUTING ANALYSIS
```

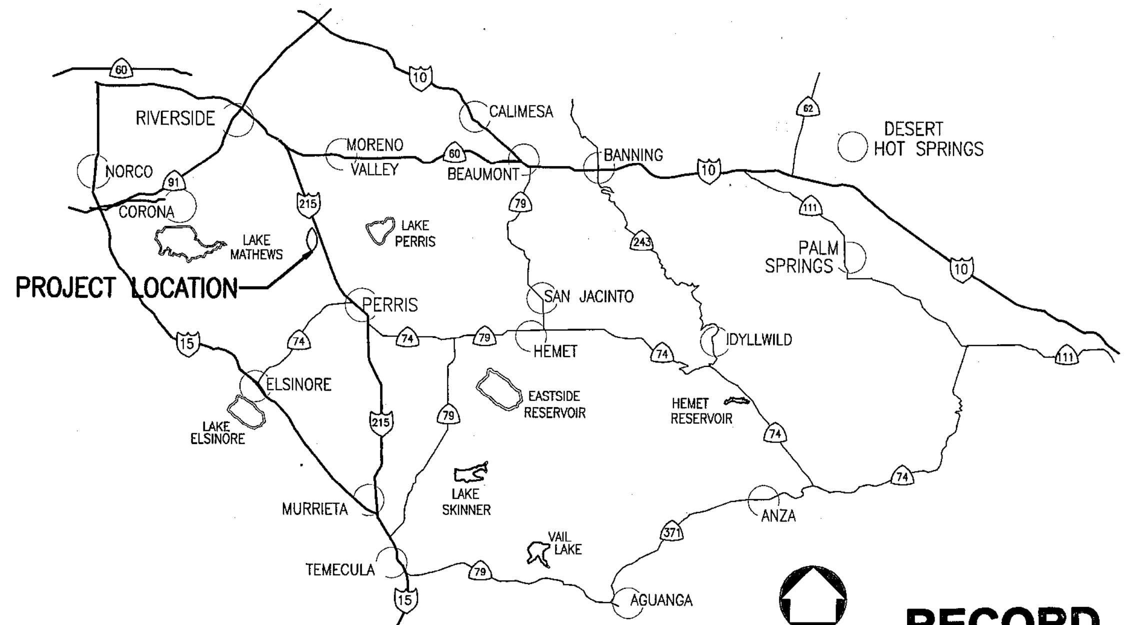
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT



INDEX MAP

GRAPHIC SCALE 1"=200'

0 200 400 600



VICINITY MAP

N.T.S.

RECORD DRAWINGS

APPROVED BY: [signature]

DATE: 4/3/14

UNDERGROUND UTILITIES NOTE

ALL UNDERGROUND STRUCTURES OR UTILITIES REPORTED BY THE OWNER OR OTHERS AND THOSE SHOWN ON THE RECORDS EXAMINED ARE INDICATED WITH THEIR APPROXIMATE LOCATION AND EXTENT.

THE OWNER, BY ACCEPTING THESE PLANS OR PROCEEDING WITH THE IMPROVEMENTS PURSUANT THERETO AGREE TO ASSUME LIABILITY AND TO HOLD THE UNDERSIGNED HARMLESS FOR ANY DAMAGES RESULTING FROM THE EXISTENCE OF UNDERGROUND UTILITIES OR STRUCTURES NOT REPORTED TO THE UNDERSIGNED, NOT INDICATED ON THE PUBLIC RECORDS EXAMINED, OR LOCATED AT A VARIANCE WITH THAT REPORTED OR SHOWN ON THE RECORDS EXAMINED.

THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO PROTECT THE UTILITIES OR STRUCTURES SHOWN AND ANY OTHER UTILITIES OR STRUCTURES FOUND AT THE SITE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE OWNERS OF THE UTILITIES OR STRUCTURES CONCERNED BEFORE STARTING WORK.

CALL UNDERGROUND SERVICE ALERT (U.S.A.) 1-800-227-2600 AT LEAST 2 WORKING DAYS PRIOR TO EXCAVATION.

NOTICE TO CONTRACTOR

CONTRACTOR AGREES THAT HE SHALL ASSUME COMPLETE AND SOLE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION, INCLUDING THE SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE IN EFFECT CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD COUNTY OF RIVERSIDE, THE OWNER, AND THE ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FROM LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR ENGINEER.

R.C.F.C. & W.C.D. STD. DRAWINGS

CB101	CATCH BASIN #4
CB109	CORNER CONNECTION TO CATCH BASIN
MH251	MANHOLE No. 1
MH252	MANHOLE No. 2
MH254	MANHOLE No. 4
M801	CHAIN LINK FENCE
M803	CONCRETE COLLAR
M816	CONCRETE BULKHEAD
M827	VEHICULAR TURN AROUND AREA

CALTRANS STD. DRAWINGS

D86B	HEADWALL AND WINGWALLS
D77A	GRATE DETAILS

SHEET INDEX

	SHEET NO.
TITLE SHEET	1
LAT B-8 PLAN AND PROFILES	2-4
LAT B-8A PLAN AND PROFILES	5-6
LAT B-8B, LAT. B-8C AND LAT B-8D PROFILES CONNECTION DETAIL	7

STATE PLANE BEARING

STATE PLANE SYSTEM BEARINGS ARE ROTATED 0°51'19" FROM RECORD BEARINGS PER PM 33942. COORDINATES SHOWN ON PLANS HAVE BEEN ADJUSTED TO STATE PLANE SYSTEM.

GENERAL NOTES

1. THE CONTRACTOR SHALL CONSTRUCT THE FLOOD CONTROL IMPROVEMENTS SHOWN ON THE DRAWINGS IN CONFORMANCE WITH THE REQUIREMENTS OF THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT'S M.O.U STANDARD SPECIFICATIONS, DATED JUNE 24, 2008, AND RCFC&WCD STANDARD MANUAL. FOR THE LATEST DRAWINGS OF THE STANDARD MANUAL, PLEASE REFER TO THE "PUBLICATIONS AND RECORDS" PAGE FOUND ON THE DISTRICT'S WEB SITE.
2. CONTACT THE ENCROACHMENT PERMIT ENGINEER AT (951) 955-1266 IF ANENCROACHMENT PERMIT IS REQUIRED FROM RIVERSIDE COUNTY FLOOD CONTROL. AFTER THE PERMIT IS ISSUED THE DISTRICT MUST BE NOTIFIED ONE WEEK PRIOR TO CONSTRUCTION.
3. CONTACT CONTRACT ADMINISTRATOR AT (951) 955-1288 IF CONSTRUCTION INSPECTION WILL BE PERFORMED BY RIVERSIDE COUNTY FLOOD CONTROL. THE DISTRICT MUST BE NOTIFIED TWENTY DAYS (20) PRIOR TO COSTRUCTION.
4. ALL STATIONING REFERS TO THE CENTERLINE OF CONSTRUCTION UNLESS OTHERWISE NOTED.
5. STATIONING FOR LATERALS AND CONNECTOR PIPE REFER TO THE CENTERLINE INTERSECTION STATION.
6. FORTY-EIGHT HOURS BEFORE EXCAVATION, CALL UNDERGROUND SERVICE ALERT 1-800-227-2600.
7. ALL ELEVATIONS SHOWN ARE IN FEET AND DECIMALS THEREOF BASED ON NATIONAL GEODETIC VERTICAL DATUM (NGVD 1929).
8. ALL COORDINATES ARE SHOWN IN FEET AND DECIMALS THEREOF BASED ON THE NORTH AMERICAN DATUM (NAD 83), CALIFORNIA COORDINATE SYSTEM (CCS), ZONE 6. EPOCH 1991.35
9. ALL CROSS SECTIONS ARE TAKEN LOOKING DOWNSTREAM.
10. ELEVATIONS AND LOCATIONS OF UTILITIES SHOWN ARE APPROXIMATE UNLESS OTHERWISE NOTED.
11. UNLESS OTHERWISE SPECIFIED, MINIMUM STREET RECONSTRUCTION SHALL BE 4" TYPE "B" HOT MIX ASPHALT OVER 6" CLASS 2 AGGREGATE BASE OR AS SPECIFIED BY THE ENGINEER.
12. OPENINGS RESULTING FROM THE CUTTING OR PARTIAL REMOVAL OF EXISTING CULVERTS, PIPES OR SIMILAR STRUCTURES TO BE ABANDONED SHALL BE SEALED WITH 6 INCHES OF CLASS "B" CONCRETE.
13. PIPE CONNECTED TO THE MAINLINE PIPE SHALL CONFORM TO JUNCTION STRUCTURE NO. 4 (JS 229) UNLESS OTHERWISE NOTED.
14. PIPE BEDDING SHALL CONFORM TO RCFC&WCD STD. DWG. M815, EXCEPT FOR COVER <2 FEET. FOR COVER <2 FEET, CONCRETE SLURRY (2000 PSI-2 SACK) SHALL BE USED. THE ENTIRE TRENCH SHALL BE SLURRY EXTENDING 4 INCHES MINIMUM AND 12 INCHES MAXIMUM ABOVE THE TOP OF THE PIPE.
15. BH-1 INDICATES SOIL BORING LOCATIONS BASED ON THE SOILS REPORT DATED JUNE 1, 2011. LOCATIONS SHOWN ARE APPROXIMATE.
16. "V" IS THE DEPTH OF INLET AND CATCH BASINS MEASURED FROM THE TOP OF CURB TO INVERT OF CONNECTOR PIPE.
17. CATCH BASINS SHALL BE LOCATED SO THAT LOCAL DEPRESSIONS SHALL BEGIN AT EXISTING CURB RETURN JOINT, UNLESS OTHERWISE SPECIFIED.
18. ALL CURBS, GUTTERS, SIDEWALKS, DRIVEWAYS AND OTHER EXISTING IMPROVEMENTS TO BE RECONSTRUCTED IN KIND AND AT THE SAME ELEVATION AND LOCATION AS THE EXISTING IMPROVEMENTS UNLESS OTHERWISE NOTED.
19. STANDARD DRAWINGS CALLED FOR ON THE PLAN AND PROFILE SHALL CONFORM TO DISTRICT STANDARD DRAWINGS UNLESS OTHERWISE NOTED.
20. THE CONTRACTOR IS REQUIRED TO CALL ALL UTILITY AGENCIES REGARDING TEMPORARY SHORING AND SUPPORT REQUIREMENTS FOR THE VARIOUS UTILITY LINES SHOWN ON THESE PLANS.
21. DURING ROUGH GRADING OPERATIONS AND PRIOR TO CONSTRUCTION OF PERMANENT DRAINAGE STRUCTURES, TEMPORARY DRAINAGE CONTROL SHOULD BE PROVIDED TO PREVENT PONDING WATER AND DAMAGE TO ADJACENT PROPERTIES.
22. APPROVAL OF THESE PLANS BY THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT DOES NOT RELIEVE THE DEVELOPER'S ENGINEERS OF RESPONSIBILITY FOR THE ENGINEERING DESIGN. IF FIELD CHANGES ARE REQUIRED, IT WILL BE THE RESPONSIBILITY OF THE DESIGN ENGINEER TO MAKE NECESSARY CORRECTIONS.
23. THE CONTRACTOR OR DEVELOPER SHALL SECURE ALL REQUIRED ENCROACHMENT AND/OR STATE AND FEDERAL REGULATORY PERMITS PRIOR TO ALL COMMENCEMENT OF ANY WORK.
24. THE CONCRETE COATING ON THE INSIDE OF ALL REINFORCED CONCRETE PIPES MUST BE INCREASED TO PROVIDE A MINIMUM OF 1-1/2 INCHES OVER THE REINFORCING AND INCREASED TO A MINIMUM OF 3-1/2 INCHES OVER THE REINFORCING FOR BOX CULVERT, WHEN DESIGN VELOCITIES EXCEED 20 FEET PER SECOND. THE CONCRETE DESIGN STRENGTH IN THESE REACHES SHALL BE F'c=5,000 PSI FOR VELOCITIES EXCEEDING 20 FEET PER SECOND AND F'c=6,000 PSI FOR VELOCITIES EXCEEDING 30 FEET PER SECOND.
25. CONSTRUCTION JOINT FOR CALTRANS STANDARD REINFORCED CONCRETE BOX SHALL BE ACCORDING TO RCFC&WCD STD DWG. NO. BX 401.

(P.M. NO. 33942/P.P. NO. 20699R1/I.P. NO. 110029)

PLAN CHECK OVERSIGHT ENGINEER	REGISTRATION NUMBER	DATE SIGNED
Alan French	45702	2-13-13

APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

REGISTERED PROFESSIONAL ENGINEER SCOTT R. HILDEBRANDT NO. C44762 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES — CIVIL ENGINEERS, 3788 McCRAY ST., RIVERSIDE CA. 92506, PH: (951) 686-1070, FAX: (951) 788-1256

PREPARED BY: [signature] R.C.E. NO. C44762

DATE: 1/31/13

Don't Dig...Until You Call U.S.A. Toll Free 1-800-227-2600 for the location of buried utility lines. Don't disrupt vital services. BURIED CABLE. TWO WORKING DAYS BEFORE YOU DIG

BENCH MARK: RIVERSIDE COUNTY B.M. 600-40-68 ALUMINUM DISK ON CONCRETE
FROM THIENES ENGINEERING ALTA
ELEV. 1505.08'
DATUM: NGVD 1929 +2.513' FOR NGVD 1988

REF.	DESCRIPTION (REVISIONS)	APPR.	DATE
△	RECORD DRAWINGS	HKT	04/01/14

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

RECOMMENDED FOR APPROVAL BY: Mark H. Wills, PLANNING ENGINEER, DATE: 2/19/2013

APPROVED BY: [signature], CHIEF ENGINEER, DATE: 3/22/13

PERRIS VALLEY MDP LATERAL B-8
PERRIS VALLEY LATERAL B-8A

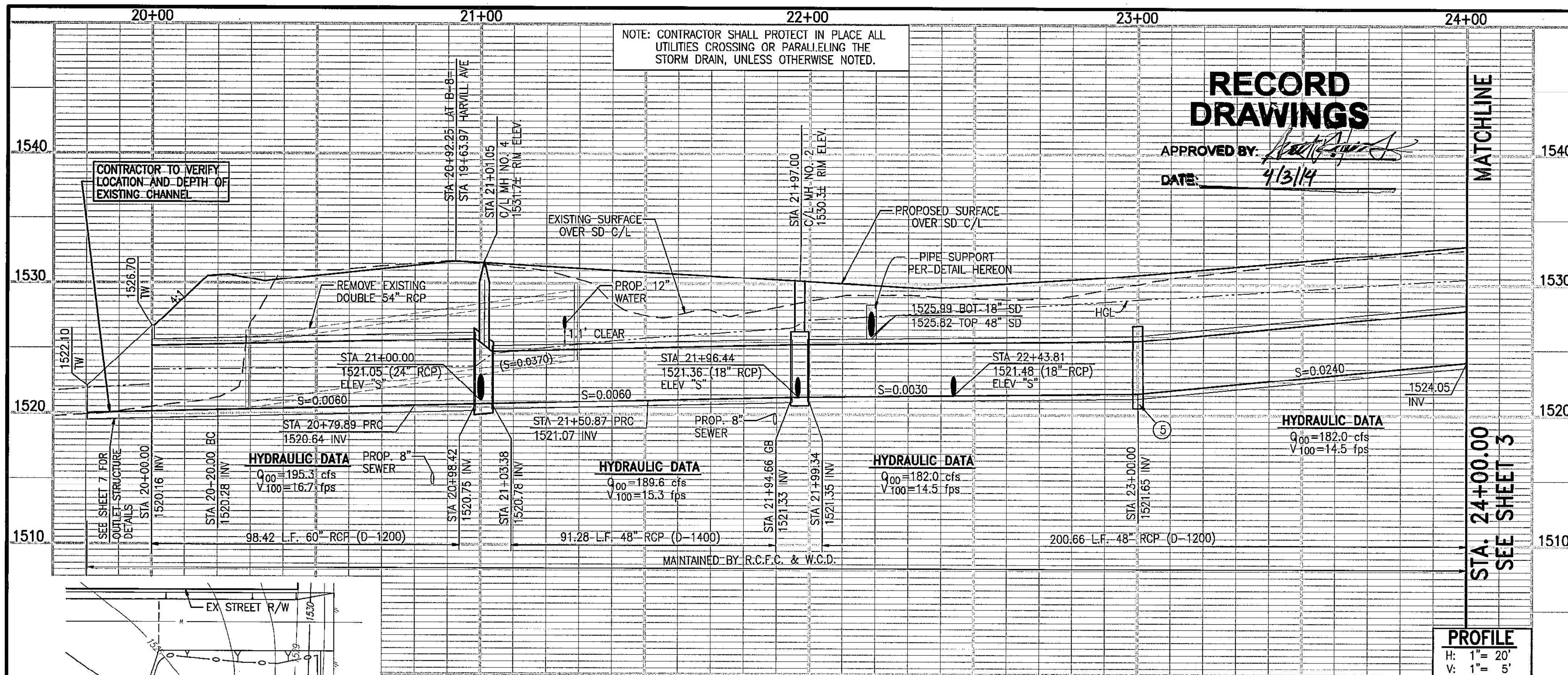
TITLE SHEET

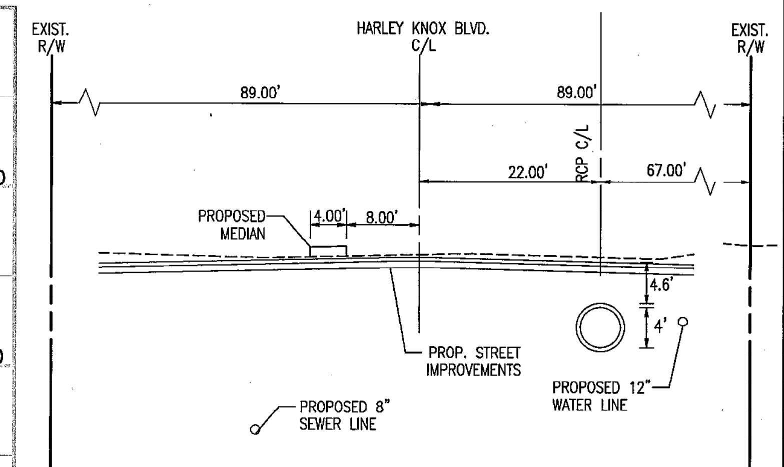
PROJECT NO. 4-0-00457 4-0-00458

DRAWING NO. 4-1060

SHEET NO. 1 OF 7

G:\2011\11-0054\DWG & PRO\Design\11-0054Ti.dwg 1/30/2013

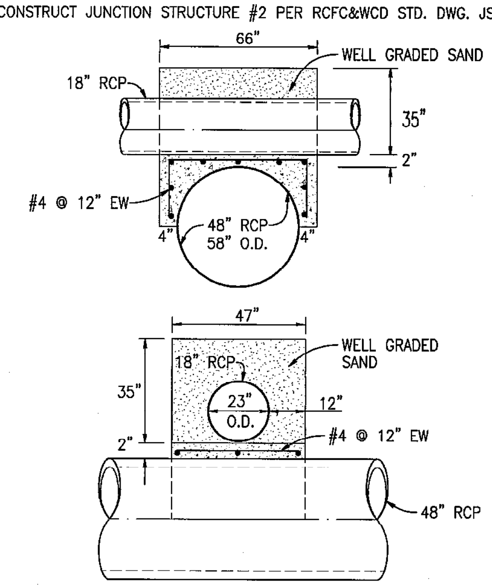




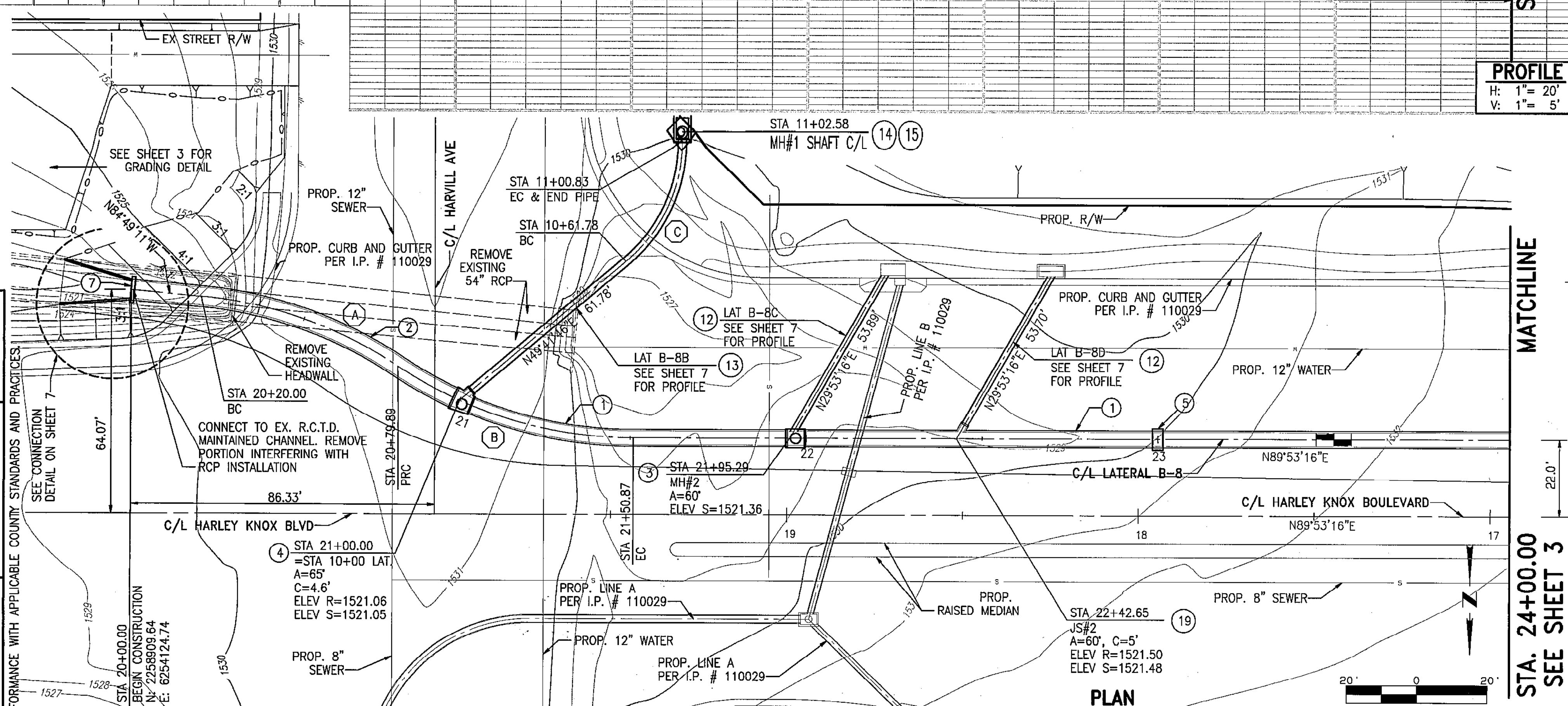
SECTION AT STATION 23+50.00
SCALE 1"=10'

CONSTRUCTION NOTES

1. CONSTRUCT 48" RCP (D-LOAD PER PROFILE)
2. CONSTRUCT 60" RCP (D-LOAD PER PROFILE)
3. CONSTRUCT MANHOLE No.2 PER RCFC&WCD STD. DWG. MH252
4. CONSTRUCT MANHOLE No.4 PER RCFC&WCD STD. DWG. MH254
5. CONSTRUCT CONCRETE COLLAR PER RCFC&WCD STD. DWG. M803
7. CONSTRUCT HEADWALL PER CALTRANS STD. D86B AND DETAILS ON SHEET 7
12. CONSTRUCT 18" RCP (CLASS IV)
13. CONSTRUCT 24" RCP (CLASS IV)
14. CONSTRUCT MANHOLE No.1 PER RCFC&WCD STD. DWG. MH251
15. CONSTRUCT 6'x5.4'x6" CONCRETE PAD W/#4@18" E.W. AROUND MANHOLE FRAME
19. CONSTRUCT JUNCTION STRUCTURE #2 PER RCFC&WCD STD. DWG. JS227



PIPE SUPPORT DETAIL
N.T.S.



PLAN

A ℄ CURVE DATA	B ℄ CURVE DATA	C ℄ CURVE DATA
Δ=28°35'52"	Δ=33°53'25"	Δ=49°43'26"
R=120.00'	R=120.00'	R=45.00'
L=59.90'	L=70.98'	L=39.05'
T=30.59'	T=36.56'	T=20.85'
BC=STA 20+20.00	BC=STA 20+79.89	BC=STA 10+61.78
EC=STA 20+79.89	EC=STA 21+50.87	EC=STA 11+00.83
PI= N 2258914.21	PI= N 2258951.54	PI= N 2258887.50
E 6254074.36	E 6254018.55	E 6253968.36

(P.M. NO. 33942/P.P. NO. 20699R1/I.P. NO. 110029)

PLAN CHECK OVERSIGHT ENGINEER: Alan French | REGISTRATION NUMBER: 45702 | DATE SIGNED: 2-13-13

APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES

REGISTERED PROFESSIONAL ENGINEER SCOTT R. HILDEBRANDT NO. C44762 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES — CIVIL ENGINEERS
3788 McCRAY ST.
RIVERSIDE CA. 92506
PH: (951) 686-1070
FAX: (951) 788-1256

PREPARED BY: | R.C.E. NO. C44762
DATE: 1/29/13

Don't Dig...Until You Call U.S.A. Toll Free 1-800-227-2600 for the location of buried utility lines. Don't disrupt vital services.
TWO WORKING DAYS BEFORE YOU DIG

BENCH MARK:
RIV. CO. BM# "600-40-68"
ALUM. DISK ON CONC.
ELEV.=1505.08'
DATUM: 1929
ELEV. 647.374

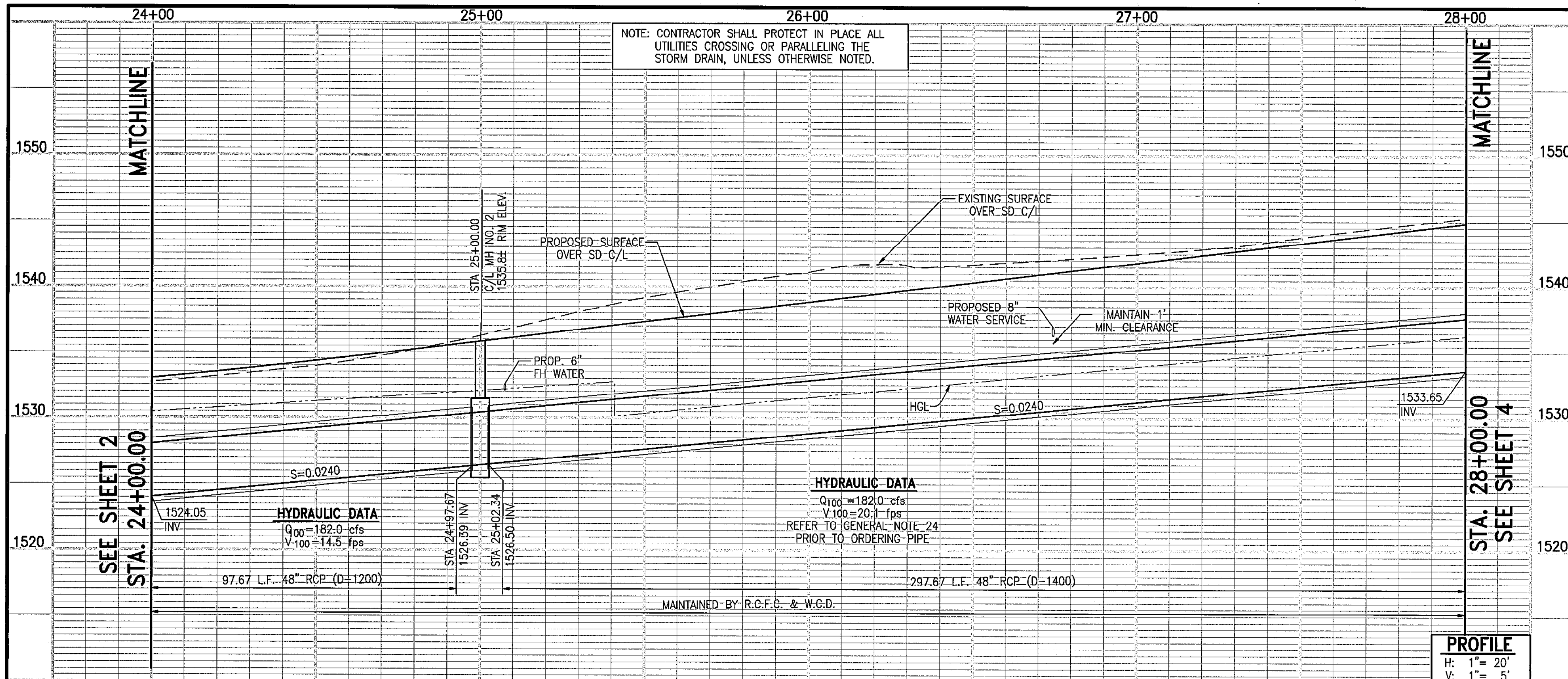
REF.	REVISIONS DESCRIPTION	APPR.	DATE

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: | DATE: 2/19/2013
APPROVED BY: | DATE: 2/19/2013

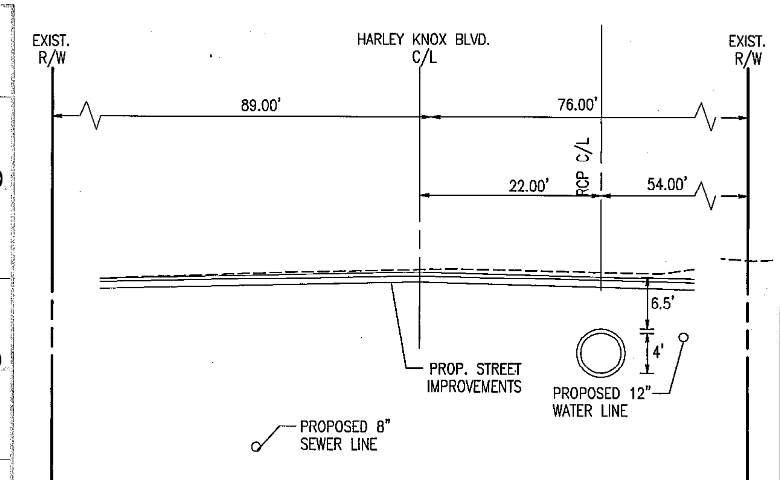
PERRIS VALLEY MDP
LATERAL B-8
STA 20+00.00 TO STA. 24+00.00

PROJECT NO. 4-0-00457
DRAWING NO. 4-1060
SHEET NO. 2 OF 7

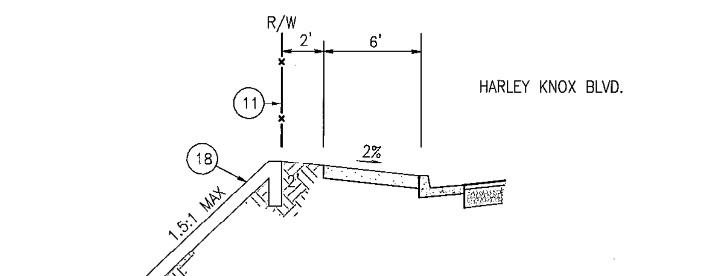
NOTE: CONTRACTOR SHALL PROTECT IN PLACE ALL UTILITIES CROSSING OR PARALLELING THE STORM DRAIN, UNLESS OTHERWISE NOTED.



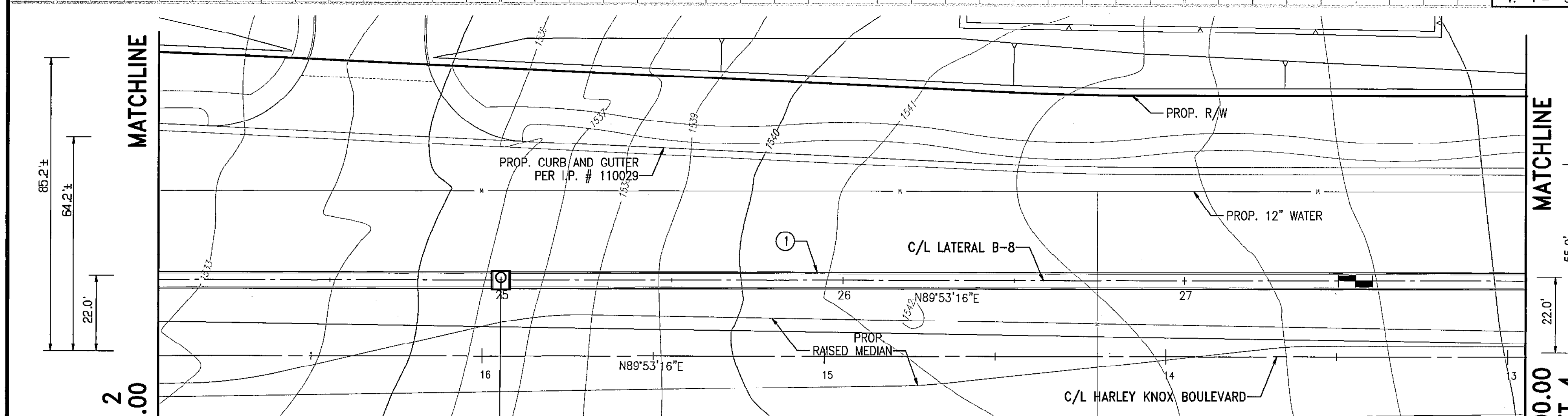
PROFILE
H: 1"= 20'
V: 1"= 5'



SECTION AT STATION 27+50.00
SCALE 1"=10'



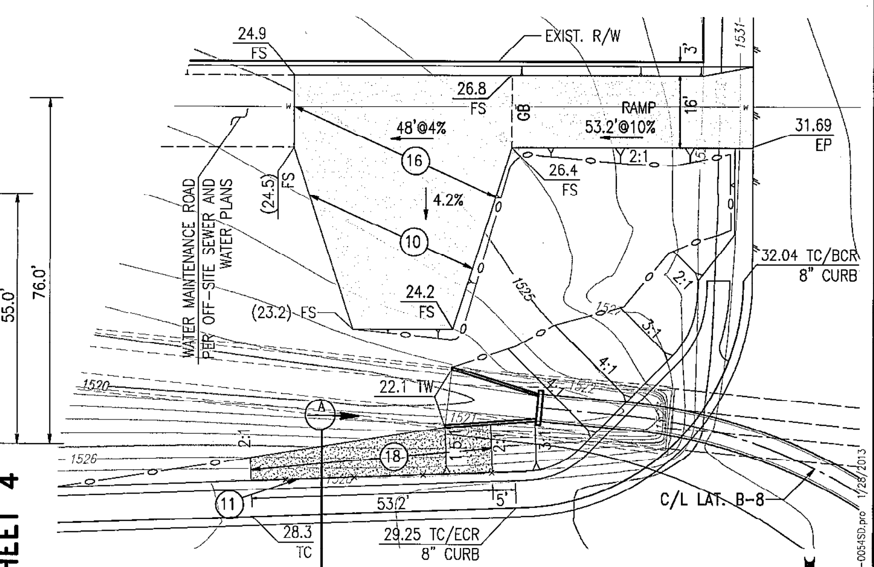
SECTION (A)
N.T.S.



RECORD DRAWINGS
APPROVED BY:
DATE: 4/3/14

PLAN

CONSTRUCTION NOTES
1. CONSTRUCT 48" RCP (D-LOAD PER PROFILE)
3. CONSTRUCT MANHOLE No.2 PER RCFC&WCD STD. DWG. MH252
10. CONSTRUCT VEHICULAR TURN AROUND AREA PER RCFC&WCD STD. DWG. M827
11. INSTALL CHAINLINK FENCE PER RCFC&WCD STD. DWG. M801.
16. CONSTRUCT 3" THICK CLASS II A.B.
18. CONSTRUCT 6" CONCRETE SLOPE ARMOR W/#4@18" E.W.



LATERAL B-8 OUTLET GRADING DETAIL
SCALE 1"=20'

20' 0 20'

REGISTERED PROFESSIONAL ENGINEER SCOTT R. HILDEBRANDT NO. C44762 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
CIVIL ENGINEERS
3788 McCRAY ST.
RIVERSIDE CA. 92506
PH: (951) 686-1070
FAX: (951) 788-1256
PREPARED BY:
DATE: 1/29/13
R.C.E. NO. C44762

Don't Dig...Until You Call U.S.A. Toll Free 1-800-227-2600 for the location of buried utility lines. Don't disrupt vital services. TWO WORKING DAYS BEFORE YOU DIG

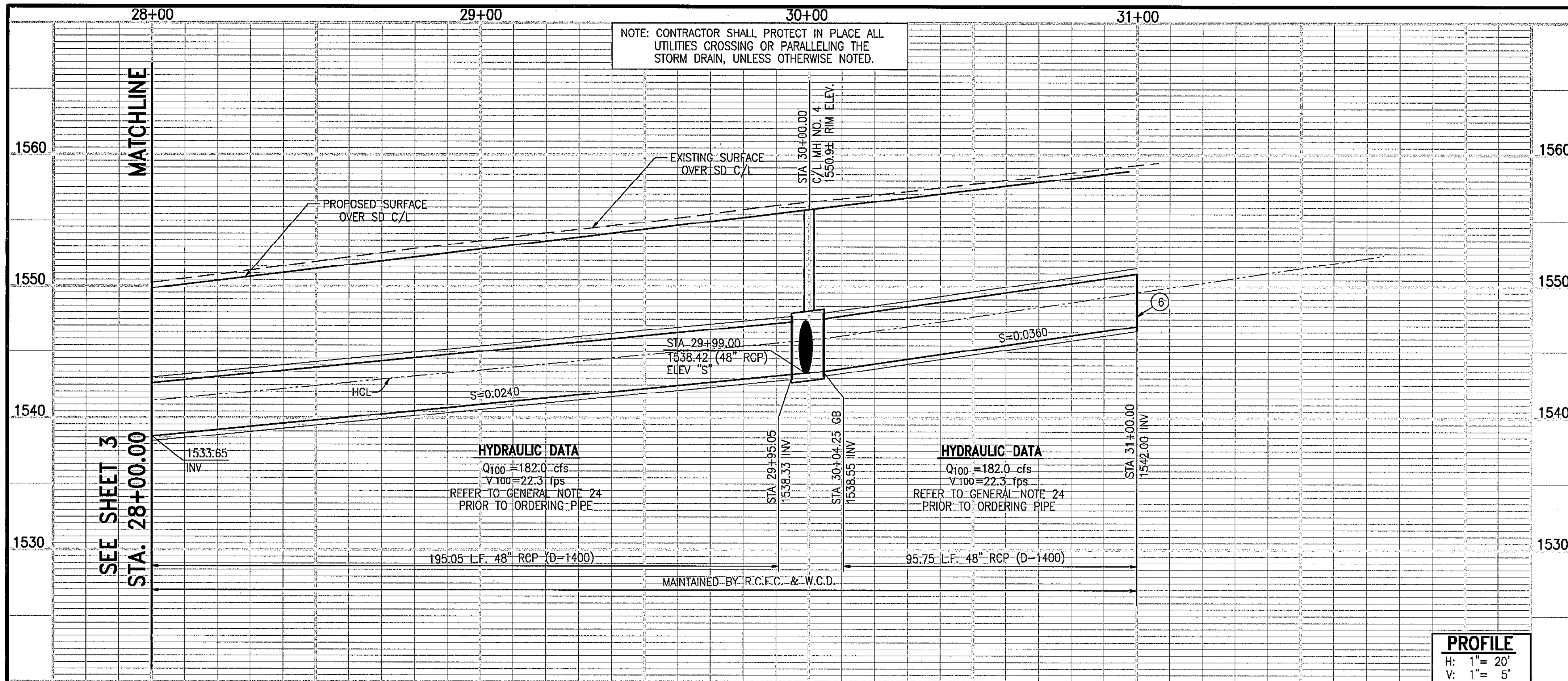
BENCH MARK:
RIVERSIDE COUNTY B.M.
600-40-68
ALUMINUM DISK ON CONCRETE
FROM THIENES ENGINEERING ALTA
ELEV. 1505.08'
DATUM: NGVD 1929 +2.513' FOR NGVD 1988

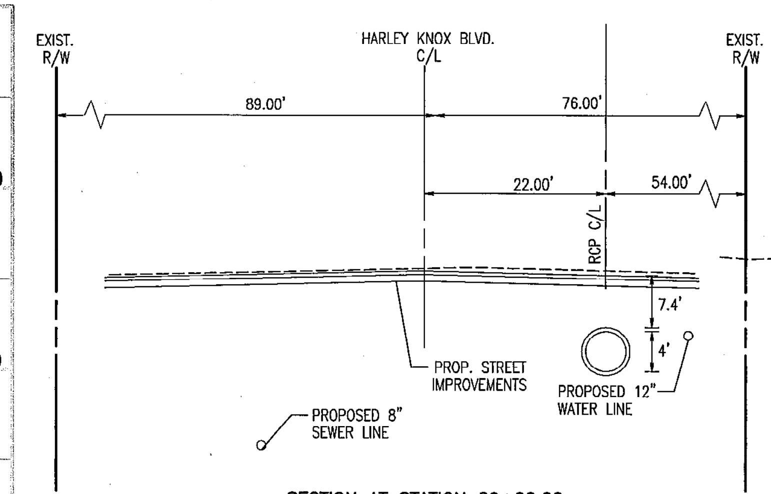
REF.	REVISIONS DESCRIPTION	APPR.	DATE

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 2/19/2013
APPROVED BY: Mark H. Wills DATE: 2/19/2013

PERRIS VALLEY MDP
LATERAL B-8
STA 24+00.00 TO STA. 28+00.00

PROJECT NO. 4-0-00457
DRAWING NO. 4-1060
SHEET NO. 3 OF 7

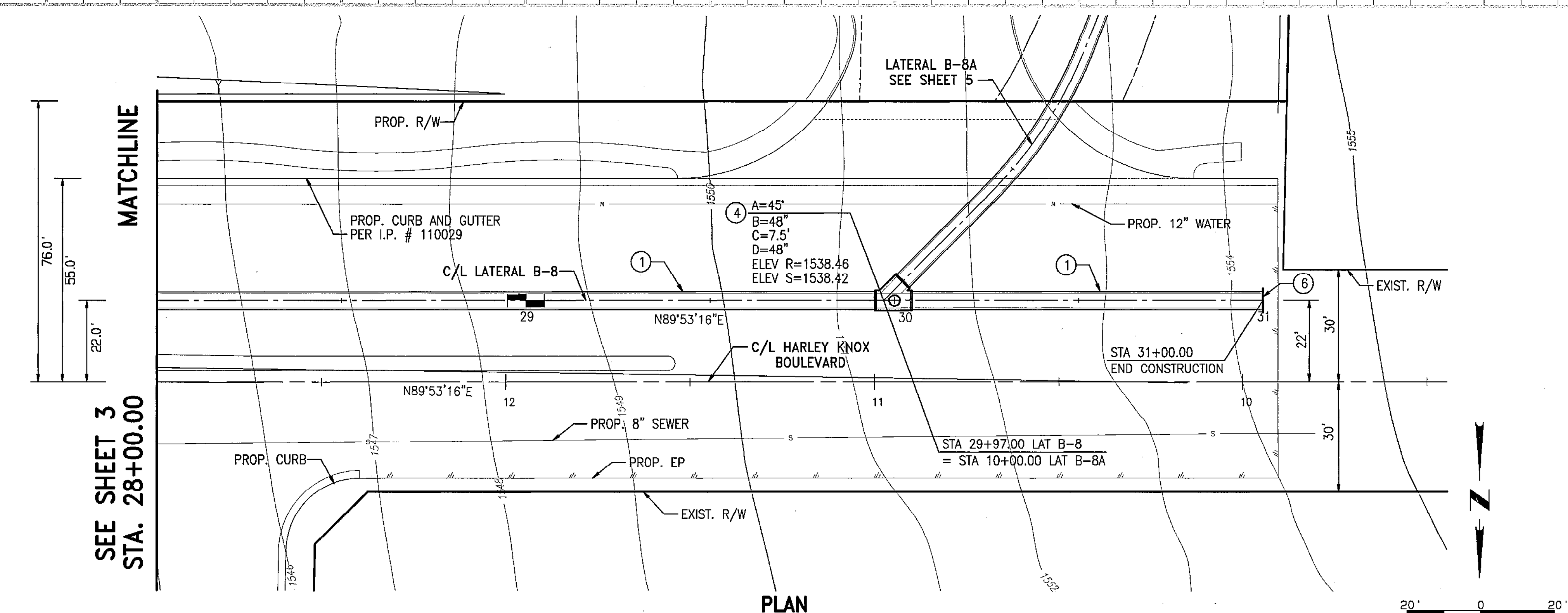




SECTION AT STATION 29+00.00
SCALE 1"=10'

CONSTRUCTION NOTES

1. CONSTRUCT 48" RCP (D-LOAD PER PROFILE)
4. CONSTRUCT MANHOLE No.4 PER RCFC&WCD STD. DWG. MH254
6. CONSTRUCT CONCRETE BULKHEAD PER RCFC&WCD STD. DWG. M816



PLAN

RECORD DRAWINGS

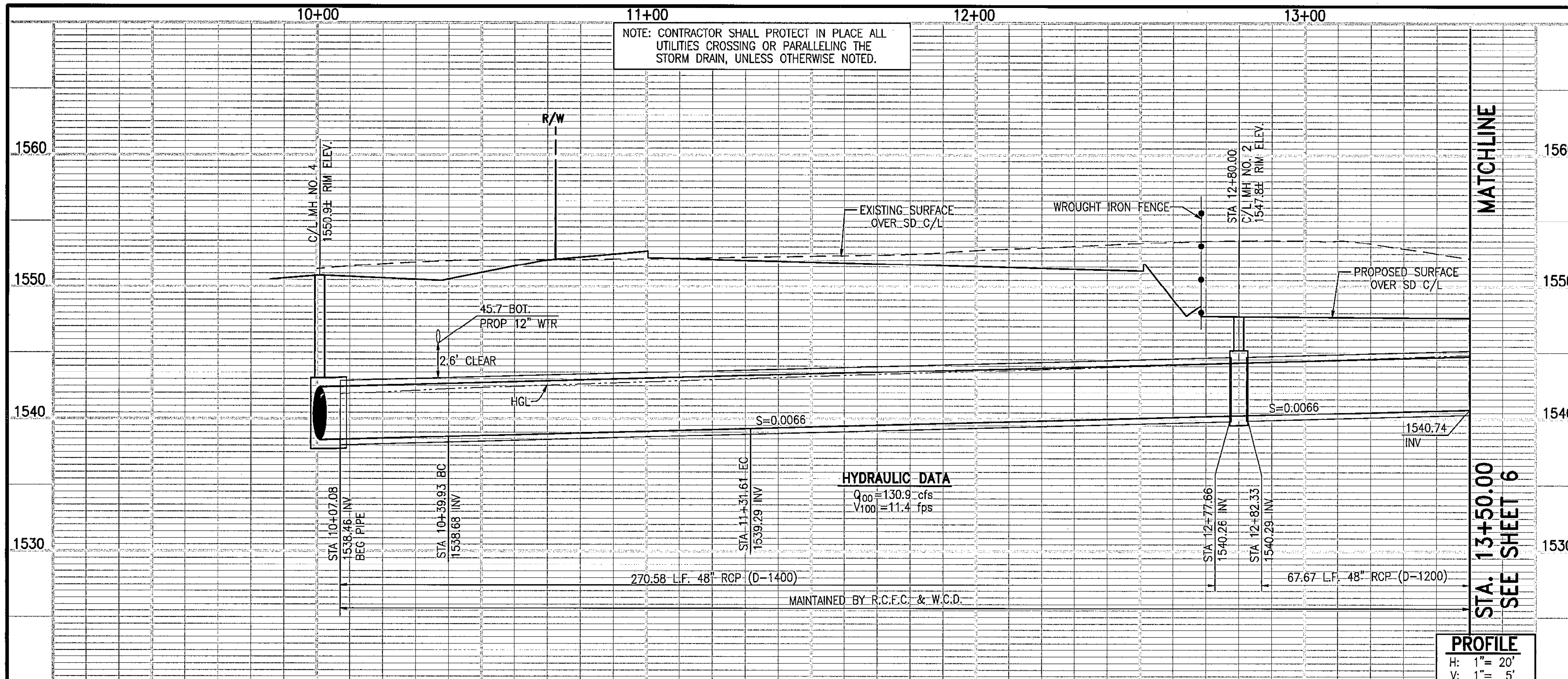
APPROVED BY: [signature]

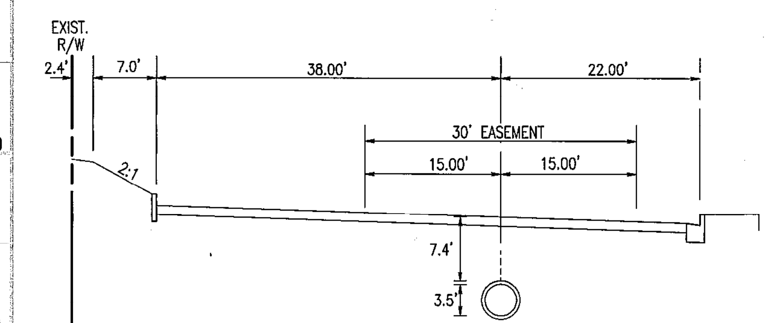
DATE: 4/3/14

ALBERT A. WEBB ASSOCIATES — CIVIL ENGINEERS, 3788 McCRAY ST., RIVERSIDE CA. 92506, PH: (951) 686-1070, FAX: (951) 788-1256. PREPARED BY: [signature] R.C.E. NO. C44762 DATE: 1/29/13	Don't Dig...Until You Call U.S.A. Toll Free 1-800-227-2600 for the location of buried utility lines. Don't disrupt vital services. TWO WORKING DAYS BEFORE YOU DIG	BENCH MARK: RIVERSIDE COUNTY B.M. 600-40-68 ALUMINUM DISK ON CONCRETE FROM THIENES ENGINEERING ALTA ELEV. 1505.08' DATUM: NGVD 1929 +2.513' FOR NGVD 1988	REVISIONS (REF. / DESCRIPTION / APPR. / DATE)	RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT. RECOMMENDED FOR APPROVAL BY: [signature] DATE: 2/15/2013. APPROVED BY: Mark H. Wills DATE: 2/19/2013

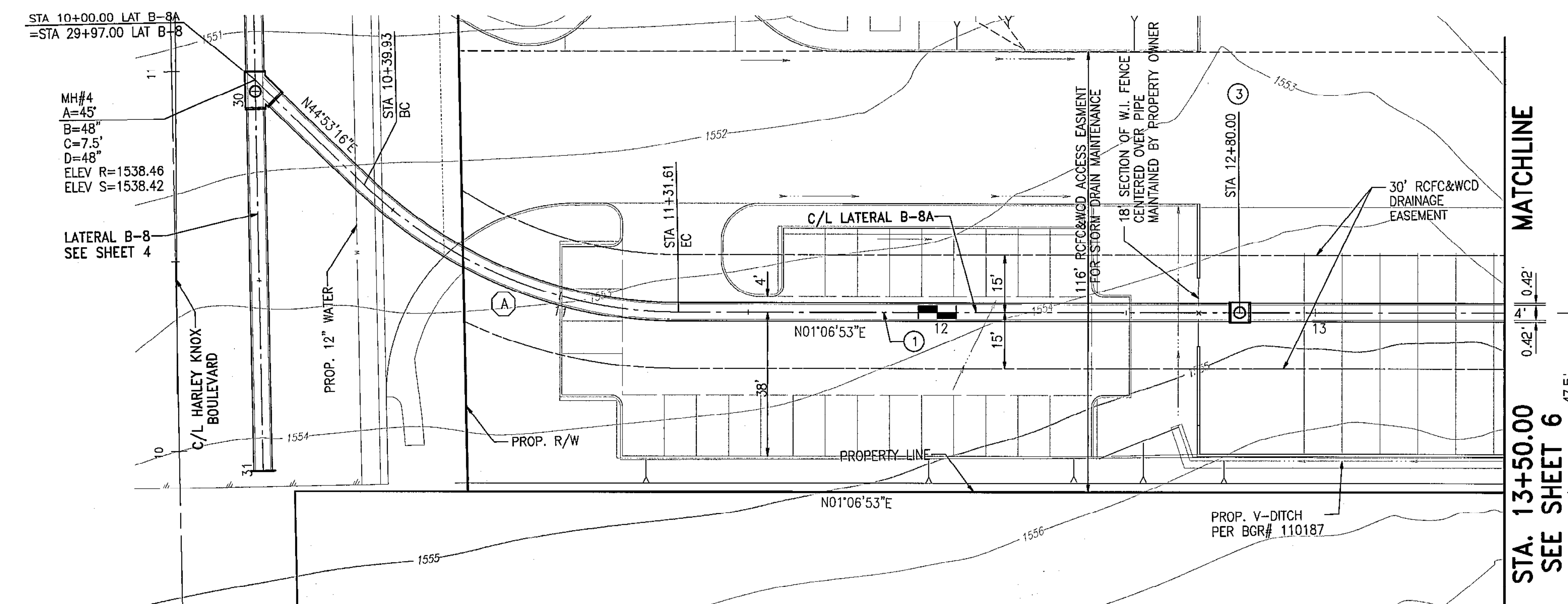
PERRIS VALLEY MDP
LATERAL B-8
STA 28+00.00 TO STA. 31+00.00

PROJECT NO. 4-0-00457
DRAWING NO. 4-1060
SHEET NO. 4 OF 7





SECTION AT STATION 12+00.00
SCALE 1"=10'



PLAN

CONSTRUCTION NOTES

1. CONSTRUCT 48" RCP (D-LOAD PER PROFILE)
3. CONSTRUCT MANHOLE No.2 PER RCFC&WCD STD. DWG. MH252

Ⓐ ℄ CURVE DATA
Δ=43°46'23"
R=60.00'
L=45.84'
T=24.10'
BC=STA 10+08.37
EC=STA 10+54.21
PI= N 2258887.37 E 6253073.66

RECORD DRAWINGS
APPROVED BY:
DATE: 4/3/14

G:\2011\11-0054\DWG & PRO\Design\11-0054SD.pro 1/28/2013

ALBERT A. WEBB ASSOCIATES
CIVIL ENGINEERS
3788 McCRAY ST.
RIVERSIDE CA. 92506
PH: (951) 686-1070
FAX: (951) 788-1256
PREPARED BY:
DATE: 1/29/13
R.C.E. NO. C44762

REGISTERED PROFESSIONAL ENGINEER SCOTT R. HILDEBRANDT NO. C44762 CIVIL STATE OF CALIFORNIA

Don't Dig...Until You Call U.S.A. Toll Free
1-800-227-2600
for the location of buried utility lines.
Don't disrupt vital services.
TWO WORKING DAYS BEFORE YOU DIG

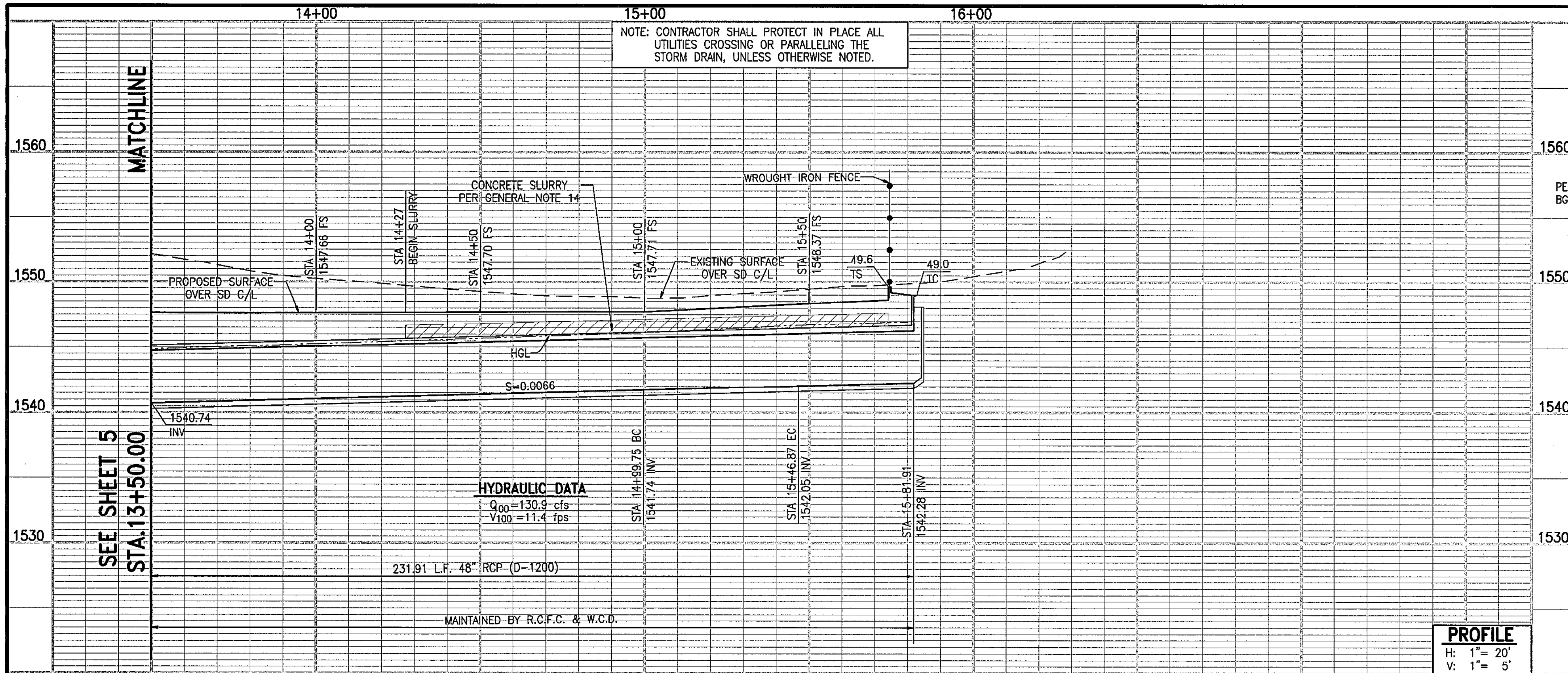
BENCH MARK:
RIVERSIDE COUNTY B.M.
600-40-68
ALUMINUM DISK ON CONCRETE
FROM THIENES ENGINEERING ALTA
ELEV. 1505.08'
DATUM: NGVD 1929 +2.513' FOR NGVD 1988

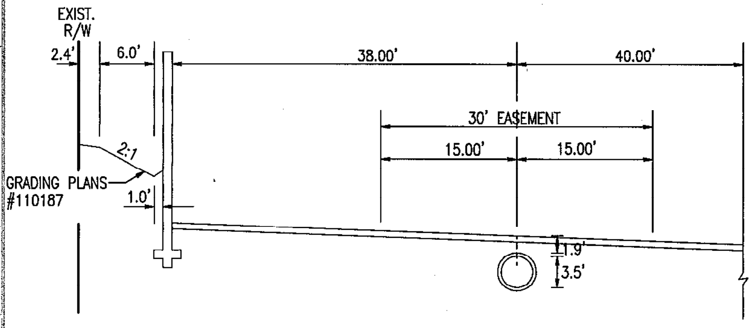
REF.	REVISIONS DESCRIPTION	APPR.	DATE

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 2/19/2013
APPROVED BY: Mark H. Wills DATE: 2/19/2013

PERRIS VALLEY
LATERAL B-8A
STA 10+00.00 TO STA. 13+50.00

PROJECT NO. 4-0-00458
DRAWING NO. 4-1060
SHEET NO. 5 OF 7

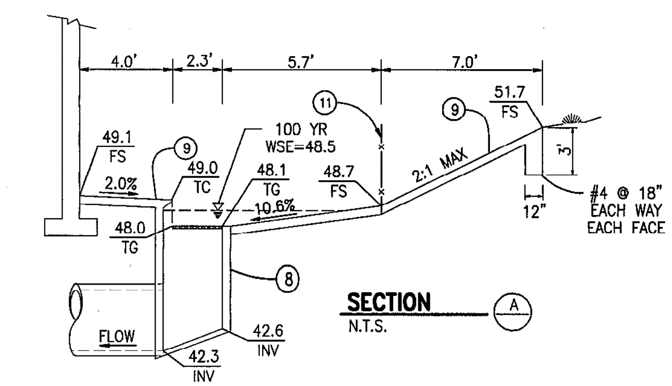




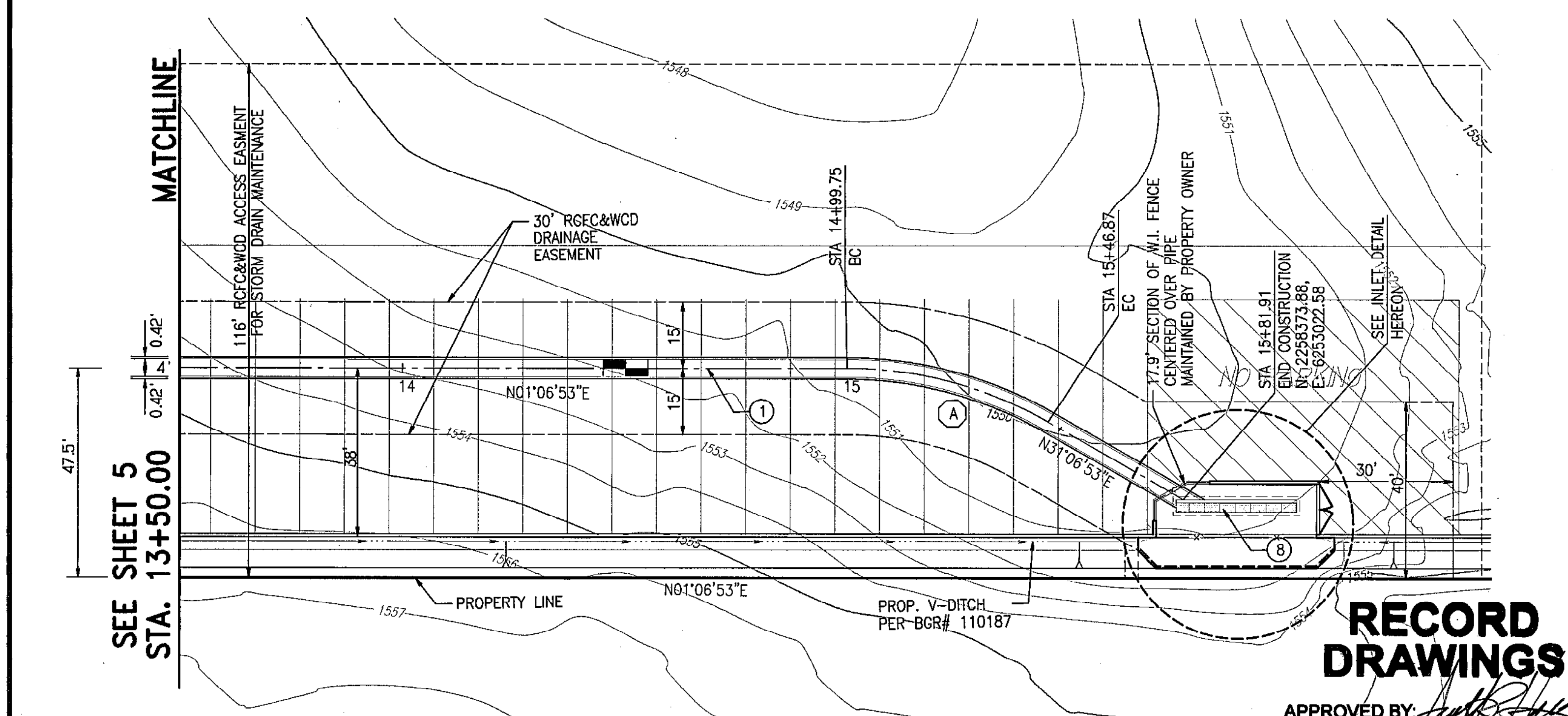
SECTION AT STATION 14+50.00
SCALE 1"=10'

CONSTRUCTION NOTES

1. CONSTRUCT 48" RCP (D-LOAD PER PROFILE)
8. CONSTRUCT CATCH BASIN #4 PER RCFC&WCD STD. DWG. CB101 (W=27.08', V=6.72') WITH 8 STEEL BAR GRATES TYPE 24-9 PER CALTRANS STD. D77A OR APPROVED EQUAL
9. INSTALL 6" CONCRETE WITH #4 @ 18" BOTH WAYS REINFORCEMENT
11. INSTALL CHAINLINK FENCE PER RCFC&WCD STD. DWG. M801 MODIFIED TO PROVIDE POST 6' O.C.
17. CONSTRUCT CORNER CONNECTION TO CATCH BASIN PER RCFC&WCD STD. DWG. CB109



SECTION (A)
N.T.S.

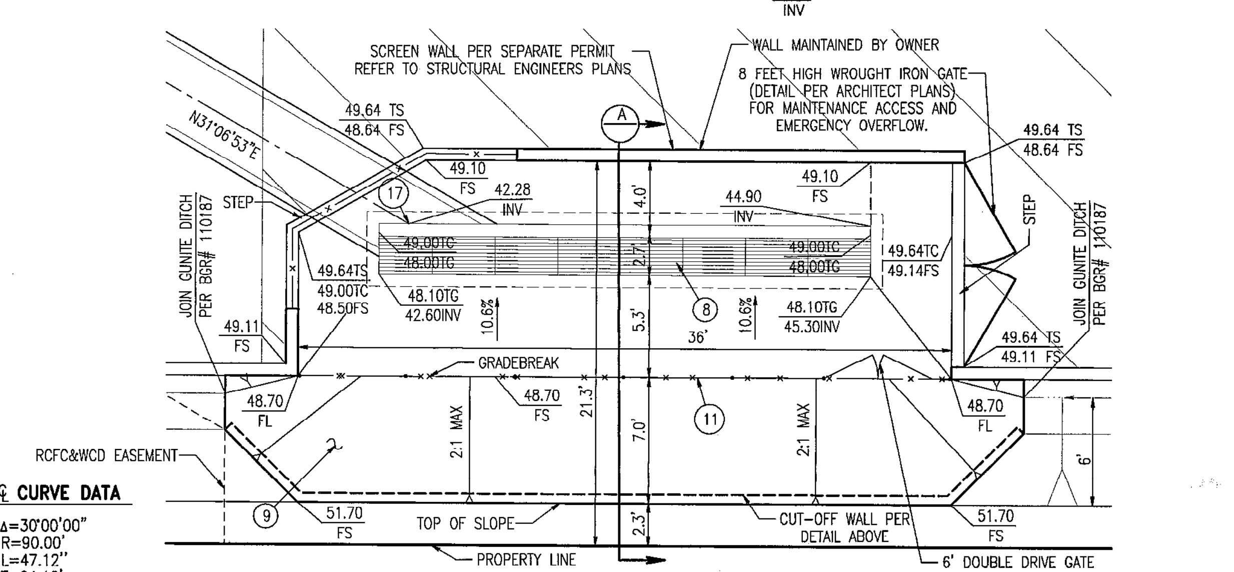


LAT B-8A

PLAN

RECORD DRAWINGS
APPROVED BY:
DATE: 4/3/14

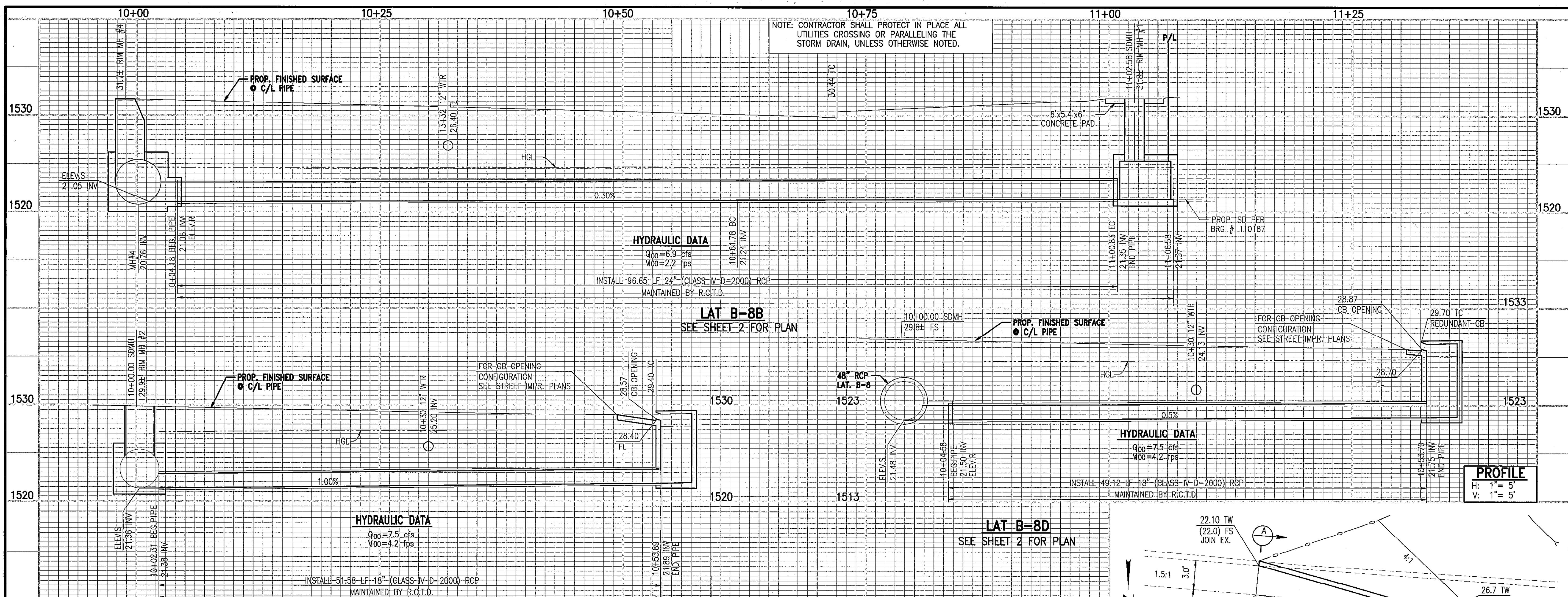
(A) ℄ CURVE DATA
Δ=30°00'00"
R=90.00'
L=47.12'
T=24.12'
BC=STA 14+99.75
EC=STA 15+46.87
PI= N 2258446.99 E 6253065.10



CURB INLET DETAIL

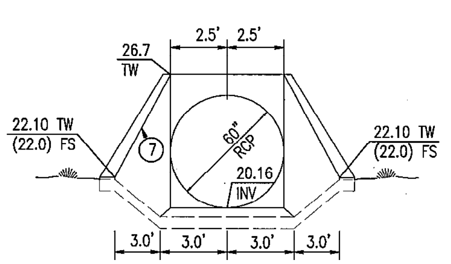
ALBERT A. WEBB ASSOCIATES — CIVIL ENGINEERS, 3788 McCRAY ST., RIVERSIDE CA. 92506, PH: (951) 686-1070, FAX: (951) 788-1256. PREPARED BY: DATE: 1/31/13 R.C.E. NO. C44762	Don't Dig...Until You Call U.S.A. Toll Free 1-800-227-2600 for the location of buried utility lines. Don't disrupt vital services. TWO WORKING DAYS BEFORE YOU DIG	BENCH MARK: RIVERSIDE COUNTY B.M. 600-40-68 ALUMINUM DISK ON CONCRETE FROM THIENES ENGINEERING ALTA. ELEV. 1505.08' DATUM: NGVD 1929 +2.513' FOR NGVD 1988	REVISIONS (REF. / DESCRIPTION / APPR. / DATE)	RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT. RECOMMENDED FOR APPROVAL BY: DATE: 2/19/2013. APPROVED BY: Mark H. Wills DATE: 2/19/2013	PERRIS VALLEY LATERAL B-8A. STA 13+50.00 TO STA. 15+83.57	PROJECT NO. 4-0-00458. DRAWING NO. 4-1060. SHEET NO. 6 OF 7

REGISTERED PROFESSIONAL ENGINEER SCOTT R. HILDEBRANDT NO. C44762 CIVIL STATE OF CALIFORNIA

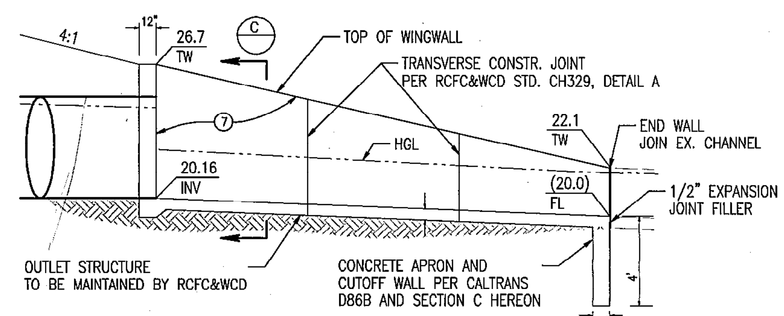


CONSTRUCTION NOTES

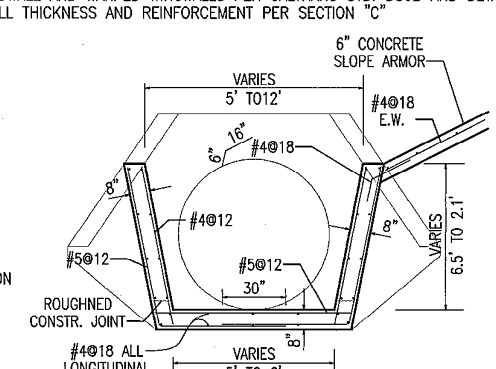
(7) CONSTRUCT HEADWALL AND WARPED WINGWALLS PER CALTRANS STD. D86B AND DETAILS HEREON. WARPED WINGWALL THICKNESS AND REINFORCEMENT PER SECTION "C"



SECTION (A)
N.T.S,



SECTION (B)
N.T.S,

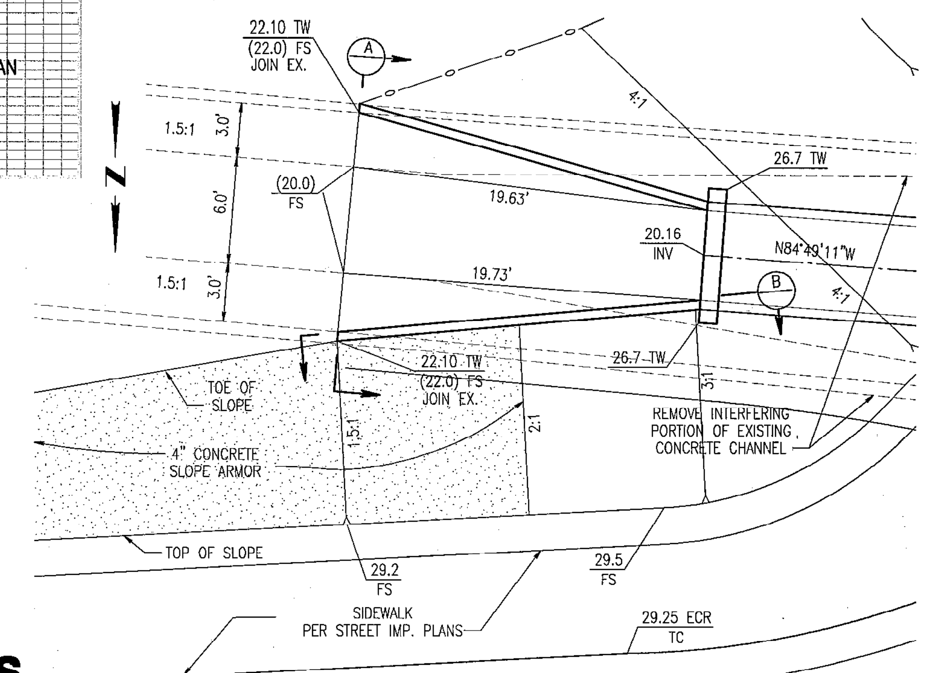


SECTION (C)
N.T.S,

RECORD DRAWINGS

APPROVED BY: [signature]

DATE: 4/8/14



CONNECTION DETAIL

5' 0 5'

PLAN CHECK OVERSIGHT ENGINEER	REGISTRATION NUMBER	DATE SIGNED
Alan French	45702	2-13-13

APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

REGISTERED PROFESSIONAL ENGINEER SCOTT R. HILDEBRANDT NO. C44762 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
CIVIL ENGINEERS
3788 McCRAY ST.
RIVERSIDE CA. 92506
PH: (951) 686-1070
FAX: (951) 788-1256
PREPARED BY: [signature]
DATE: 1/29/13
R.C.E. NO. C44762

Don't Dig...Until You Call U.S.A. Toll Free 1-800-227-2600 for the location of buried utility lines. Don't disrupt vital services. TWO WORKING DAYS BEFORE YOU DIG

BENCH MARK:
RIV. CO. BM# "600-40-68"
ALUM. DISK ON CONC.
ELEV.=1505.08'
DATUM: 1929
ELEV. 647.374

REF.	REVISIONS DESCRIPTION	APPR.	DATE

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: [signature] DATE: 2/15/2013
APPROVED BY: Mark H. Wills DATE: 2/19/2013

PERRIS VALLEY MDP
LATERAL B-8
LATERAL PROFILES

PROJECT NO. 4-0-00457
DRAWING NO. 4-1060
SHEET NO. 7 OF 7

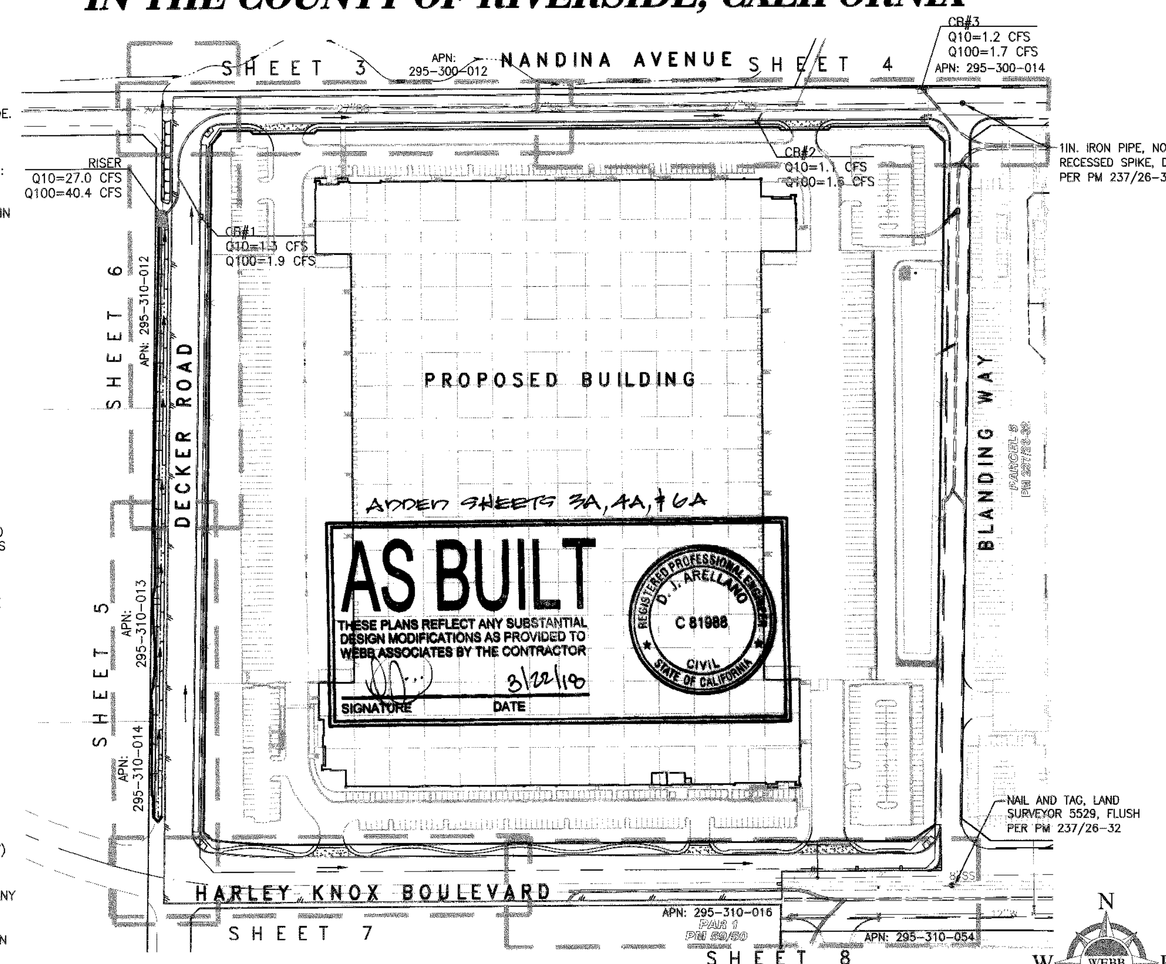
G:\2011\11-0054\DWG & PROD\Design\11-0054SD.pro 1/28/2013

STREET IMPROVEMENT PLANS FOR
TCC NANDINA BUSINESS CENTER
PLOT PLAN NO. 25954
IN THE COUNTY OF RIVERSIDE, CALIFORNIA

GENERAL NOTES

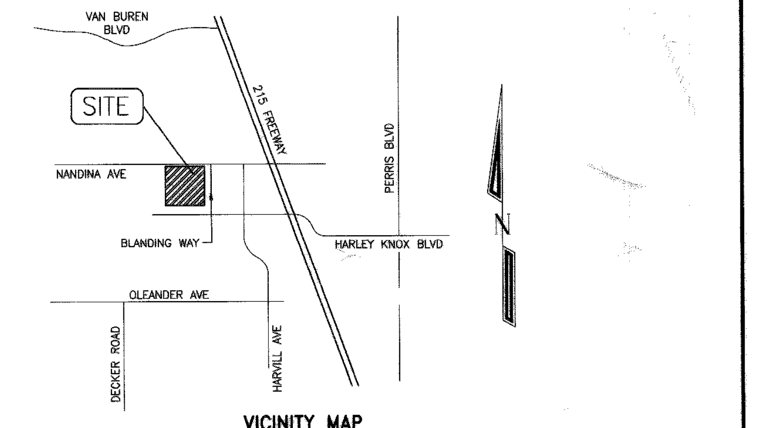
1. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER/OWNER CONTRACTOR TO APPLY TO THE RIVERSIDE COUNTY TRANSPORTATION DEPARTMENT, PERMIT SECTION, FOR AN ENCROACHMENT PERMIT FOR ALL WORK PERFORMED WITHIN PUBLIC RIGHT-OF-WAY, DEDICATED AND ACCEPTED FOR PUBLIC USE; AND TO BE RESPONSIBLE FOR SATISFACTORY COMPLIANCE FOR ALL CURRENT ENVIRONMENTAL REGULATIONS DURING THE LIFE OF CONSTRUCTION ACTIVITIES FOR THIS PROJECT, ADDITIONAL STUDIES AND/OR PERMITS MAY BE REQUIRED.
2. THE CONTRACTOR/DEVELOPER SHALL BE RESPONSIBLE FOR THE CLEARING OF THE WORK AREA, AND RELOCATION COSTS OF ALL EXISTING UTILITIES. THIS INCLUDES UNDERGROUNDING OF EXISTING OVERHEAD LINES ALONG THE PROJECT FRONTAGE AS REQUIRED BY THE CONDITIONS OF APPROVAL. PERMITEE MUST INFORM COUNTY OF CONSTRUCTION SCHEDULE AT LEAST 48 HOURS PRIOR TO BEGINNING OF CONSTRUCTION. PHONE: (951) 955-6790.
3. THE DEVELOPER WILL INSTALL STREET NAME SIGNS CONFORMING TO COUNTY STANDARD NO. 1220 AND 1221.
4. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE RIVERSIDE COUNTY TRANSPORTATION DEPARTMENT IMPROVEMENT STANDARDS AND SPECIFICATIONS, LATEST EDITION, COUNTY ORDINANCE NO. 461 AND SUBSEQUENT AMENDMENTS.
5. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER TO NOTIFY THE ENGINEER TO INSTALL STREET CENTERLINE MONUMENTS AS REQUIRED BY RIVERSIDE COUNTY ORDINANCE NO. 461. IF CONSTRUCTION CENTERLINE DIFFERS, PROVIDE A TIE TO EXISTING CENTERLINE OF RIGHT-OF-WAY. PRIOR TO ROAD CONSTRUCTION, SURVEY MONUMENTS INCLUDING CENTERLINE MONUMENTS, TIE POINTS, PROPERTY CORNERS AND BENCH MARKS SHALL BE REFERENCED OUT AND CORNER RECORDS FILED WITH THE COUNTY SURVEYOR PURSUANT TO SECTION 8771 OF THE BUSINESS & PROFESSIONAL CODE. SURVEY POINTS DESTROYED DURING CONSTRUCTION SHALL BE RESET, AND A SECOND CORNER RECORD FILED FOR THOSE POINTS PRIOR TO COMPLETION AND ACCEPTANCE OF THE IMPROVEMENTS.
6. ALL UNDERGROUND FACILITIES, WITH LATERALS, SHALL BE IN PLACE PRIOR TO PAVING THE STREET, INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING: SEWER, WATER, ELECTRIC, GAS, STORM DRAINS.
7. CURB DEPRESSIONS AND DRIVEWAY APPROACHES WILL BE INSTALLED AND CONSTRUCTED ACCORDING TO COUNTY STANDARD NO. 207A, AS DIRECTED IN THE FIELD.
8. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER OR CONTRACTOR TO INSTALL AND MAINTAIN ALL CONSTRUCTION, REGULATORY, GUIDE AND WARNING SIGNS WITHIN THE PROJECT LIMITS AND ITS SURROUNDINGS TO PROVIDE SAFE PASSAGE FOR THE TRAVELING PUBLIC AND WORKERS UNTIL THE FINAL COMPLETION AND ACCEPTANCE OF THE PROJECT BY THE COUNTY. A TRAFFIC CONTROL PLAN MUST BE SUBMITTED FOR REVIEW TO THE PERMITS SECTION OR INSPECTION SECTION (FOR MAP CASES) PRIOR TO OBTAINING AN ENCROACHMENT PERMIT.
9. ALL STREET SECTIONS ARE TENTATIVE. ADDITIONAL SOIL TESTS MAY BE TAKEN BY THE COUNTY AFTER ROUGH GRADING TO DETERMINE THE EXACT STREET SECTION REQUIREMENTS. USE STANDARD NO. 401 IF EXPANSIVE SOILS ARE ENCOUNTERED.
10. ASPHALTIC EMULSION (FOG SEAL) SHALL BE APPLIED NOT LESS THAN FOURTEEN DAYS FOLLOWING PLACEMENT OF THE ASPHALT SURFACING. FOG SEAL AND PAINT BINDER SHALL BE APPLIED AT A RATE OF 0.05 AND 0.03 GALLON PER SQUARE YARD RESPECTIVELY. ASPHALTIC EMULSION SHALL CONFORM TO SECTION 37, 39 AND 94 OF THE STATE STANDARD SPECIFICATIONS.
11. PRIME COAT IS REQUIRED PRIOR TO PAVING ON ALL GRADES IN EXCESS OF TEN PERCENT.
12. INSTALL STREET TREES IN ACCORDANCE WITH ORDINANCE NO. 461 AND THE COMPREHENSIVE LANDSCAPING GUIDELINES (SEE SEPARATE LANDSCAPE PLANS).
13. STREET LIGHTS SHALL BE INSTALLED IN ACCORDANCE WITH THE APPROVED STREET LIGHTING PLAN.
14. AS DETERMINED BY THE TRANSPORTATION DIRECTOR, THE DEVELOPER IS RESPONSIBLE AS A MINIMUM FOR ROAD IMPROVEMENTS TO CENTERLINE, AND MAY BE REQUIRED TO RECONSTRUCT EXISTING PAVEMENT, INCLUDING BASE, AND MATCHING OVERLAY REQUIRED TO MEET THE STRUCTURAL STANDARDS FOR THE CURRENT ASSIGNED TRAFFIC INDEX.
15. ONLY LANDSCAPING CONSISTING OF GRASS AND PARKWAY TREES MAY BE INSTALLED WITHIN PARKWAYS ON LOCAL RESIDENTIAL STREETS WITHOUT SEPARATE LANDSCAPE PLANS. ALL OTHER TYPES OF LANDSCAPING IN THESE AREAS, AND ALL LANDSCAPING ON ALL OTHER STREETS, SHALL REQUIRE SEPARATE LANDSCAPE PLANS. ALL LANDSCAPING ENCROACHMENTS SHALL CONFORM TO RIVERSIDE COUNTY COMPREHENSIVE LANDSCAPING GUIDELINES DATED OCTOBER 2009.
16. ANY PRIVATE DRAINAGE FACILITIES SHOWN ON THESE PLANS ARE FOR INFORMATION ONLY. BY SIGNING THESE IMPROVEMENT PLANS, NO REVIEW OR APPROVAL OF THOSE PRIVATE FACILITIES IS IMPLIED OR INTENDED BY THE RIVERSIDE COUNTY TRANSPORTATION DEPARTMENT.
17. a. CONSTRUCTION PROJECTS MUST OBTAIN A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT. OWNERS/DEVELOPERS ARE REQUIRED TO FILE A NOTICE OF INTENT (NOI) WITH THE STATE WATER RESOURCES CONTROL BOARD (SWRCB), PREPARE A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) AND MONITORING PLAN FOR THE SITE.

    b. PRIOR TO ANY CONSTRUCTION, THE DEVELOPER SHALL PROVIDE THE COUNTY A COPY OF THE NOI WITH A VALID WDID NUMBER.
18. THE DEVELOPER SHALL BE RESPONSIBLE FOR THE INSTALLATION OF ADDITIONAL SIGNS AND MARKINGS NOT INCLUDED IN THE SIGNING AND STRIPING PLAN WITHIN THE PROJECT AREAS, OR ON ROADWAYS ADJACENT TO THE PROJECT BOUNDARIES, UPON THE REQUEST OF THE DIRECTOR OF TRANSPORTATION OR HIS DESIGNEE TO IMPROVE TRAFFIC SAFETY ON THE ROADS UNDER THE JURISDICTION OF THE DEPARTMENT.
19. EXISTING STORM DRAIN PIPES / CULVERTS (WHETHER TO BE CONNECTED TO, EXTENDED, ADJUSTED, DRAINED TO, OR JUST IN THE PROJECT VICINITY) MUST BE REPAIRED, AND/OR CLEANED TO MAKE THEM FUNCTIONAL AND ACCEPTABLE AS DIRECTED BY THE TRANSPORTATION DEPARTMENT.
20. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER/CONTRACTOR TO APPLY TO RIVERSIDE COUNTY FLOOD CONTROL (RCFC) FOR PERMITS WHEN ANY STORM DRAIN PIPE NEEDS TO BE CONNECTED WITH A RCFC FACILITY AND ADD PERMIT #________ ON THE PLAN.
21. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER OR CONTRACTOR TO APPLY TO THE CITY AND OR CALIFORNIA DEPARTMENT OF TRANSPORTATION (CALTRANS) FOR AN ENCROACHMENT PERMIT FOR ALL WORK PERFORMED WITHIN THEIR RIGHT-OF-WAY.
22. FOR ALL DRIVEWAY RECONSTRUCTION BEYOND RIGHT-OF-WAY, PROOF OF DRIVEWAY OWNER NOTIFICATION IS REQUIRED PRIOR TO CONSTRUCTION.
23. BEDDING PIPE SHALL CONFORM TO RCFC&WCD STD. DWG. M815, EXCEPT FOR COVER <2 FEET. FOR COVER <2 FEET, CONCRETE SLURRY (2000 PSI-2 SACK) SHALL BE USED. THE ENTIRE TRENCH SHALL BE SLURRY EXTENDING 4 INCHES MINIMUM AND 12 INCHES MAXIMUM ABOVE THE TOP OF THE PIPE.
24. ALL CATCH BASINS SHALL BE STENCILED WITH "NO DUMPING – ONLY RAIN IN THE DRAIN" PER R.C.F.C. & W.C.D. STANDARDS.



INDEX MAP
1"=150'

1" = 150'
150 75 0 150 300 450



VICINITY MAP
T3S R4W SEC 35
NOT TO SCALE

CONSTRUCTION NOTES AND QUANTITY ESTIMATE*

1	CONSTRUCT MINIMUM 0.53' AC OVER 0.5' AB CLASS II (86,970 SF)	3,320 1,610	TONS CY
2	CONSTRUCT MINIMUM 0.43' AC OVER 0.50' AB CLASS II (57,850 SF)	1,790 1,070	TONS CY
3	CONSTRUCT MINIMUM 0.39' AC OVER 0.50' AB CLASS II (59,060 SF)	1,660 1,090	TONS CY
4	LEFT INTEIONALLY BLANK	–	–
5	CONSTRUCT TYPE "A-8" CURB & GUTTER PER RIV. CO. STD. NO. 201	1,300	LF
6	CONSTRUCT TYPE "A-6" CURB & GUTTER PER RIV. CO. STD. NO. 200	3,760	LF
7	CONSTRUCT CONCRETE APRON AND TRANSITION PER DETAIL ON SHEET 10	330	SF
8	CONSTRUCT CONCRETE PIPE INLET TYPE GCP PER CALTRANS STD D75B MODIFIED TO 48" RISER PER DETAIL ON SHEET 10	1	EA
9	CONSTRUCT 1.0' CLASS II AB @ EP PER TYP. EDGE OF PAVEMENT DETAIL ON SHEET 2	80	CY
10	SAWCUT & JOIN EX. AC PAVEMENT PER DETAIL ON SHEET 2	450	LF
11	CONSTRUCT CURB RAMP CASE "A" OR "B" (MODIFIED) PER. RIV. CO. STD. NO. 403	3	EA
12	CONSTRUCT 6' SIDEWALK AT CURB PER RIV. CO. STD. NO. 401	132,000	SF
13	CONSTRUCT 5' MEANDERING SIDEWALK PER RIV. CO. STD. NO. 404	27,500	SF
14	CONSTRUCT COMMERCIAL DRIVEWAY APPROACH PER RIV. CO. STD. 207A	5 6,000	EA SF
15	REMOVE EX. AC PAVEMENT	50	SY
16	SAWCUT & REMOVE EX. CURB & GUTTER	160	LF
17	ADJUST TO GRADE	1	EA
18	PROTECTECT IN PLACE	1	EA
19	CONSTRUCT CONCRETE COLLAR PER RCFC&WCD STD. NO. M803	1	EA
20	CONSTRUCT CURB INLET CATCH BASIN WITH FOSSIL FILTER AND LOCAL DEPRESSION PER RIV. CO. STD. 300, 300A, & 311. USE SPECIAL CONNECTIONS PER RCFC&WCD STD NO. CB109 FOR CORNER CONNECTIONS	3	EA
21	CONSTRUCT 3" AC PAVEMENT LINED V-DITCH (12,125 SF)	220 110	TONS CY
40	INSTALL 18" RCP STORM DRAIN (D-LOAD PER PLAN)	65	LF
41	INSTALL 30" RCP STORM DRAIN (D-LOAD PER PLAN)	1,500	LF
42	INSTALL 36" RCP STORM DRAIN (D-LOAD PER PLAN)	15	LF
43	CONSTRUCT MANHOLE NO. 4 PER RCFC&WCD STD. NO. MH254	1	EA
44	CONSTRUCT MANHOLE NO. 1 PER RCFC&WCD STD. NO. MH251	4	EA
45	DEMOLISH EXISITING CATCH BASIN	1	EA

*THE QUANTITY ESTIMATE SHOWN HEREON IS FOR THE USE OF GOVERNING AGENCIES IN DETERMINING BOND AMOUNT AND/OR FEES AND IS NOT TO BE USED FOR BID PURPOSES.

UNDERGROUND UTILITIES NOTE

ALL UNDERGROUND STRUCTURES OR UTILITIES REPORTED BY THE OWNER OR OTHERS AND THOSE SHOWN ON THE RECORDS EXAMINED ARE INDICATED WITH THEIR APPROXIMATE LOCATION AND EXTENT.

THE OWNER, BY ACCEPTING THESE PLANS OR PROCEEDING WITH THE IMPROVEMENTS PURSUANT THERETO AGREES TO ASSUME LIABILITY AND TO HOLD THE UNDERSIGNED HARMLESS FOR ANY DAMAGES RESULTING FROM THE EXISTENCE OF UNDERGROUND UTILITIES OR STRUCTURES NOT REPORTED TO THE UNDERSIGNED, NOT INDICATED ON THE PUBLIC RECORDS EXAMINED, LOCATED AT VARIANCE WITH THAT REPORTED OR SHOWN ON THE RECORDS EXAMINED.

THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO PROTECT THE UTILITIES OR STRUCTURES SHOWN AND ANY OTHER UTILITIES OR STRUCTURES FOUND AT THE SITE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE OWNERS OF THE UTILITIES OR STRUCTURES CONCERNED BEFORE STARTING WORK.

CALL UNDERGROUND SERVICE ALERT (U.S.A.) 1-800-227-2600 AT LEAST 2 WORKING DAYS PRIOR TO EXCAVATION.

UTILITY COMPANIES

WATER:	EASTERN MUNICIPAL WATER DISTRICT
SEWER:	EASTERN MUNICIPAL WATER DISTRICT
ELECTRIC:	SOUTHERN CALIFORNIA EDISON
TELEPHONE:	VERIZON
GAS:	SOUTHERN CALIFORNIA GAS COMPANY

GEOTECHNICAL

GEOTECHNICAL REPORT BY:	MATRIX GEOTECHNICAL CONSULTING INC.
PROJECT NO.:	M1103-006
PRELIMINARY R-VALUE:	25
DATED:	01-21-2016

ENGINEER OF RECORD NOTE

WEBB ASSOCIATES WAS RETAINED AS THE ENGINEER OF RECORD FOR THE DEVELOPMENT AND PROCESSING OF THESE PLANS FOR CONSTRUCTION PURPOSES. SAID PLANS HAVE BEEN REVIEWED AND APPROVED BY THE LOCAL GOVERNING AGENCY TO BE CONSTRUCTIBLE BASED ON LOCAL INDUSTRY STANDARDS. THIS DOES NOT MEAN, HOWEVER, THAT EVERY HORIZONTAL DIMENSION OR VERTICAL ELEVATION NECESSARY FOR CONSTRUCTION IS DELINEATED ON SAID DRAWINGS. ANY PART OF THESE DRAWINGS THAT IS TO BE USED IN STAKING THE PROPERTY HAS BEEN PREPARED BY WEBB WITH THE EXPECTATION AND ASSUMPTION THAT ANY STAKING, WHETHER BY WEBB, OWNER OR A THIRD PARTY, WILL BE PERFORMED UNDER THE SUPERVISION AND CONTROL OF A LICENSED LAND SURVEYOR AND WILL INCLUDE ON-SITE INTERPRETATION, VERIFICATION, CROSS-CHECKING AND FIELD CORRECTIONS OF PLANS, DRAWINGS, SURVEY INFORMATION AND ELECTRONIC DATA AT THE TIME OF ACTUAL STAKING OF THE PROPERTY PRIOR TO CONSTRUCTION.

NOTICE TO CONTRACTORS

CONTRACTOR AGREES THAT HE SHALL ASSUME COMPLETE AND SOLE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER AND ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FROM LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR ENGINEER.

THE EXISTENCE AND LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF AVAILABLE RECORDS. THESE LOCATIONS ARE APPROXIMATE AND SHALL BE CONFIRMED IN FIELD BY THE CONTRACTOR, SO THAT ANY NECESSARY ADJUSTMENT CAN BE MADE IN ALIGNMENT AND/OR GRADE OF THE PROPOSED IMPROVEMENT. THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO PROTECT ANY UTILITY LINES SHOWN AND ANY OTHER LINES NOT SHOWN ON THESE PLANS.

MAJOR ITEMS TO BE REMOVED HAVE BEEN NOTED ON THESE PLANS, HOWEVER THE CONTRACTOR IS TO WALK THE SITE FOR VERIFICATION OF ADDITIONAL SURFACE FEATURES REQUIRING REMOVAL. THE CONTRACTOR IS RESPONSIBLE TO REMOVE ALL OBJECTS AND MATERIALS (AC, CONCRETE, TREES, BUSHES, FENCING, ETC.) THAT ARE IN CONFLICT WITH THE NEW PROPOSED IMPROVEMENTS WHETHER CALLE-OUT OR NOT ON THE PLANS AND DISPOSE OF LEGALLY. CONTRACTOR IS TO BACKFILL ACCORDINGLY AND LEAVE SITE IN A RELATIVELY LEVEL CONDITION.

CASH-IN-LIEU NOTE FOR MEDIAN

AN AMOUNT OF $ 108,657.42 HAS BEEN PLACED INTO ACCOUNT #20000-3130100000-230106 FOR THE FUTURE CONSTRUCTION OF MEDIAN LOCATED ON HARLEY KNOX BLVD. WHICH IS NOT FEASIBLE TO BUILD AT THIS TIME.
RECEIPT NO: 29087-12 , DATE: 1-4-17

BASIS OF BEARINGS

THE BASIS OF BEARINGS FOR THIS SURVEY IS THE CALIFORNIA STATE PLANE COORDINATE SYSTEM, CCS83, ZONE 6, BASED LOCALLY ON CONTROL STATIONS "MLFP", "CNPP" AND "PPBF" NAD 83(NSRS2007) AS SHOWN HEREON. ALL BEARINGS SHOWN ON THIS MAP ARE GRID. QUOTED BEARINGS AND DISTANCES FROM REFERENCE MAPS OR DEEDS ARE AS SHOWN PER THAT RECORD REFERENCE. ALL DISTANCES SHOWN ARE GROUND DISTANCES UNLESS SPECIFIED OTHERWISE. GRID DISTANCES, MAY BE OBTAINED BY MULTIPLYING THE GROUND DISTANCE BY A COMBINATION FACTOR OF 1.00000283. CALCULATIONS ARE MADE AT FOUND MONUMENT LOCATED AT THE CENTERLINE INTERSECTION OF NANDINA AVENUE AND DECKER ROAD WITH COORDINATES OF: N: 2260304.10, E: 6252014.28, USING AN ELEVATION OF 1564.87(NAVD88).

BENCHMARK

USC & GS BENCHMARKS:

Z 1143 1961 (PID #DX2103) + 3¼" BRASS DISK, SET IN TOP OF A CONCRETE MONUMENT.

STATION IS NEAR THE INTERSECTION OF INTERSTATE 215 AND VAN BUREN BLVD. ABOUT 0.10 MILE N OF AVE. A, ABOUT 0.35 S DIRT PATROL ON THE E SIDE OF ATSF RAILROAD TRACKS, 15 FEET SE OF MILEPOST 11, 183 FEET SE OF A SWITCH STAND, 25 FEET E OF TRACKS, 5.4 FEET W OF 215 FWY RIGHT OF WAY, AND 5 INCHES ABOUT GROUND. MARK IS METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA STANDARD DISK STAMPED Z 1143 1961.

ELEV. = 1535.16, (NAVD 88) NAVD88–2.38=NGVD29

CASH IN-LIEU FOR TRAFFIC SIGNAL

AN AMOUNT OF $16,200 AND $13,600 FOR CUMULATIVE IMPACTS TO HARLEY KNOX BLVD. AT THE I-215 SOUTHBOUND RAMPS AND I-215 NORTHBOUND RAMPS, RESPECTIVELY, HAS BEEN PLACED IN ACCOUNT# 20000-3130100000-230106;
RECEIPT NO: 29087-13, 29087-14 , DATE: 1-4-17

RCFC PERMIT NO:

LEGEND

GRIND AND OVERLAY EXISTING PAVEMENT
COMPACTED NATIVE

BCR	BEGIN CURB RETURN	FL	FLOW LINE
BC	BEGIN CURVE	FS	FINISH SURFACE
CB	CATCH BASIN	GB	GRADE BREAK
CL	CENTER LINE	HP	HIGH POINT
DWY	DRIVE WAY	INV	INVERT
EC	END OF CURVE	LS	LANDSCAPE AREA
ECR	END OF CURB RETURN	LP	LOW POINT
EG	EXISTING GROUND	MAX	MAXIMUM
EP	EDGE OF PAVEMENT	MIN	MINIMUM
FG	FINISHED GRADE	PL	PROPERTY LINE
		RL	RIDGELINE
		R/W	RIGHT OF WAY
		SD	STORM DRAIN
		STA	STATION
		TC	TOP OF CURB
		TG	TOP OF GRADE
		TWR	TOP OF WEIR
		TYP	TYPICAL

NOTE:

THIS PROJECT IS BONDED AND WILL BE INSPECTED BY COUNTY PERMIT DEPARTMENT

AS-BUILT PLAN
CORRECTIONS NOTED
SIGNATURE: 9-5-18

SHEET INDEX

SHEET 1	TITLE SHEET
SHEET 2	STREET SECTIONS & DRIVEWAY DETAILS
SHEET 3–4	PLAN AND PROFILE – NANDINA AVENUE
SHEET 5–6	PLAN AND PROFILE – DECKER ROAD
SHEET 7–8	PLAN AND PROFILE – HARLEY KNOX BLVD
SHEET 9–10	STORM DRAIN PLAN AND PROFILE

PP 25954 IP 160028

RECMD | COUNTY OVERSIGHT ENGINEER | REGISTRATION 45702 | DATE SIGNED 1-5-17

APPROVED AS TO COMPLIANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

DIGALERT
DIAL BEFORE YOU DIG
TWO WORKING DAYS BEFORE YOU DIG
TOLL FREE 1-800-227-2600
A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

NOTE:
WORK CONTAINED WITHIN THESE PLANS SHALL NOT COMMENCE UNTIL AN ENCROACHMENT PERMIT AND/OR A GRADING PERMIT HAS BEEN ISSUED.

THE PRIVATE ENGINEER SIGNING THESE PLANS IS RESPONSIBLE FOR ASSURING THE ACCURACY AND ACCEPTABILITY OF THE DESIGN HEREON. IN THE EVENT OF DISCREPANCIES ARISING AFTER COUNTY APPROVAL OR DURING CONSTRUCTION, THE PRIVATE ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY THE COUNTY.

MARK	BY	DATE	REVISIONS	APPR.	DATE
1			Sheet 3A added	MM	4-5-18
ENGINEER				COUNTY	

SEAL – ENGINEER
REGISTERED PROFESSIONAL ENGINEER D.J. ARELLANO NO. 81988 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
ENGINEERING CONSULTANTS
3788 McCRAY STREET
RIVERSIDE CA. 92506
PH. (951) 686-1070

PREPARED UNDER THE SUPERVISION OF:
D.J. ARELLANO
DESIGNED BY: MS CHECKED BY: SL
R.C.E. NO.: 81988
11/1/16
DATE

BENCHMARK:
SEE SHEET 1

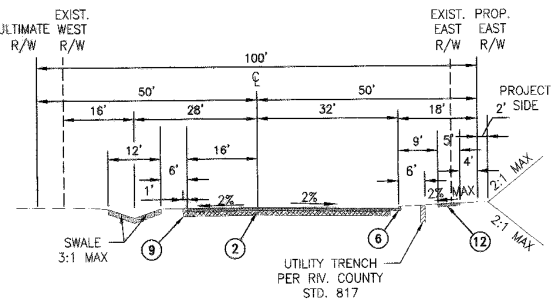
SCALE:
H: AS SHOWN V: N/A

COUNTY OF RIVERSIDE
PLOT PLAN NO. 25954
NANDINA BUSINESS CENTER
STREET IMPROVEMENT PLAN
TITLE SHEET

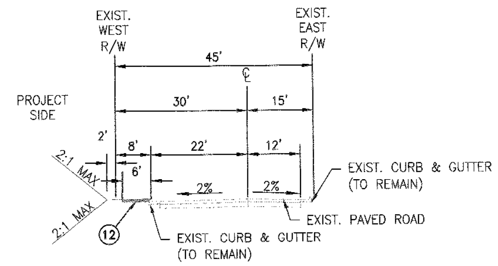
FOR: TRAMMELL CROW COMPANY
W.O. 2015-0324
COUNTY FILE NO. 964B

SHEET NO. 1
OF 10 SHEETS

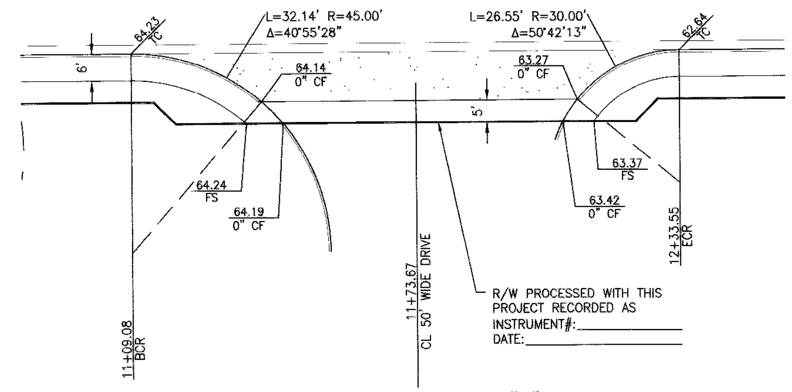
G:\2015\15-0324\DRAWINGS\DESIGN (0D)\15-0324-C-ST.DWG 10/4/2016 11:10 AM



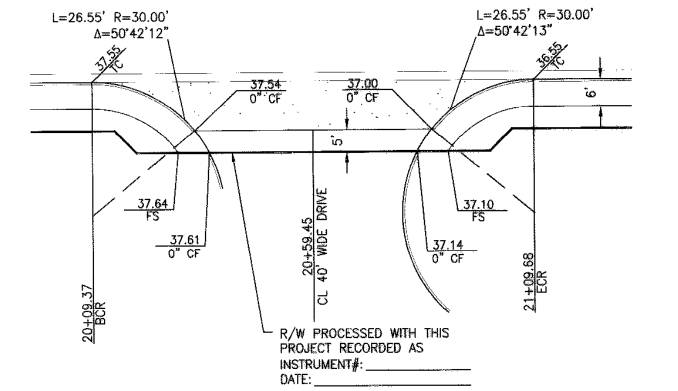
DECKER ROAD
(STA 20+00.00 – STA 33+14.37)
SECONDARY HIGHWAY – STD. NO. 94
T.I.=8.5 R VALUE=60
NOT TO SCALE



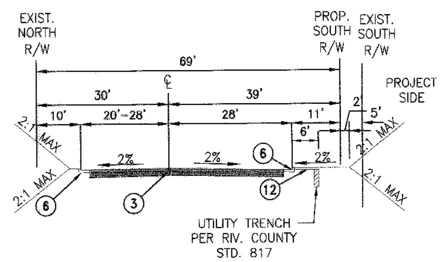
BLANDING WAY
(STA 20+00.00 – STA 33+33.77)
COLLECTOR FRONTAGE ROAD – STD. NO. 107A
T.I.=5.5 R VALUE=60
NOT TO SCALE



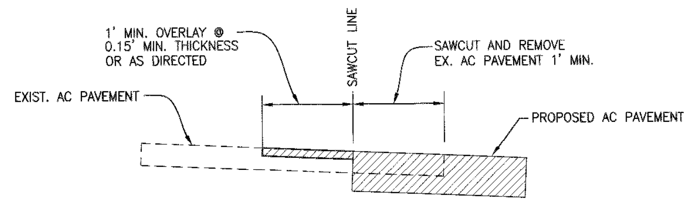
DRIVEWAY DETAIL "A"
NANDINA AVENUE
STA 11+71.39
SCALE 1"=20'



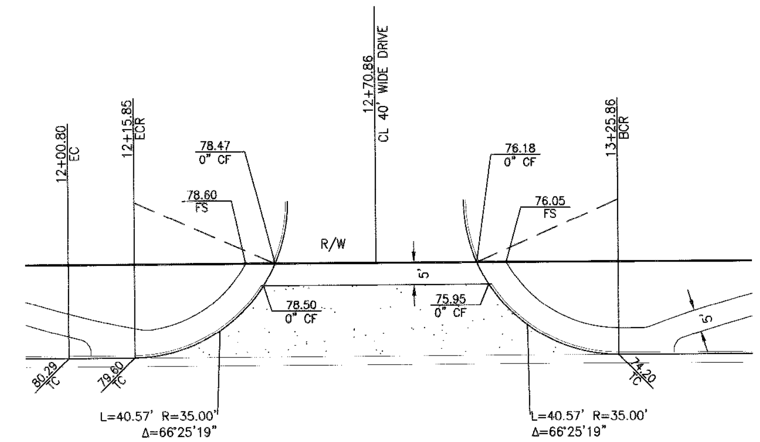
DRIVEWAY DETAIL "B"
NANDINA AVENUE
STA 20+59.45
SCALE 1"=20'



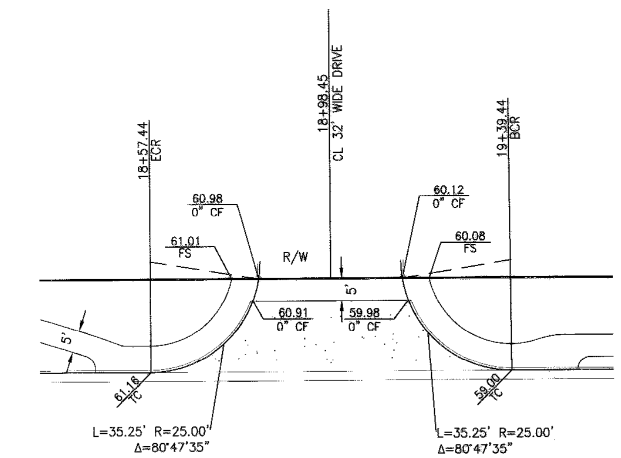
NANDINA AVENUE
(STA 10+00.00 – STA 23+29.37)
INDUSTRIAL COLLECTOR ROAD – STD. NO. 111
T.I.=8.0 R VALUE=60
NOT TO SCALE



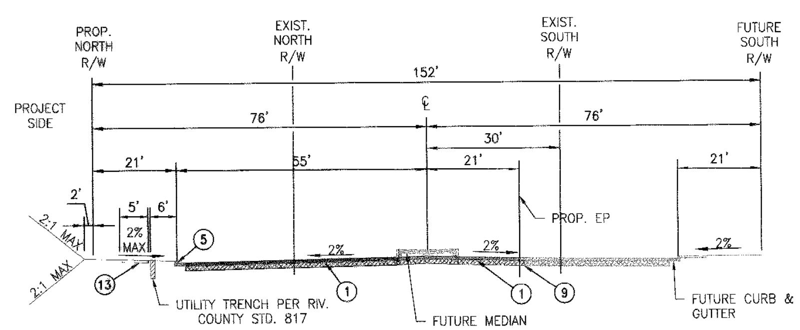
(10) **SAWCUT & JOIN DETAIL**
NOT TO SCALE



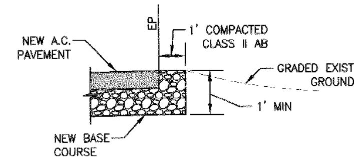
DRIVEWAY DETAIL "C"
HARLEY KNOX BOULEVARD
STA 12+70.86
SCALE 1"=20'



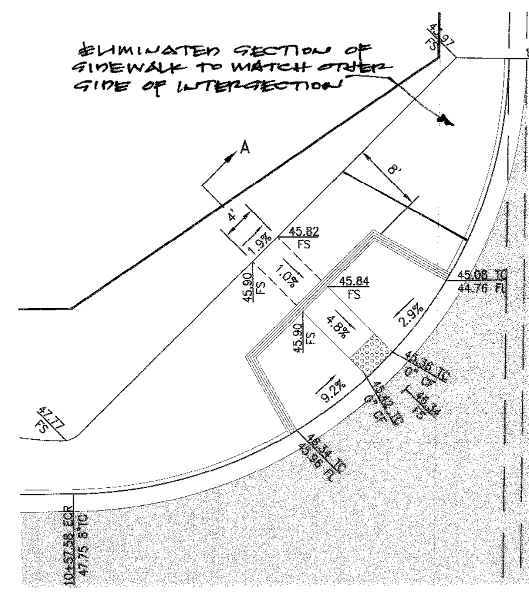
DRIVEWAY DETAIL "D"
HARLEY KNOX BOULEVARD
STA 18+98.45
SCALE 1"=20'



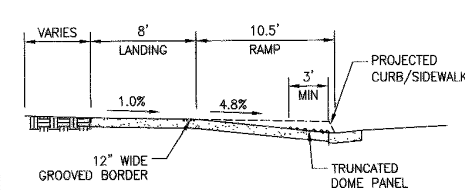
HARLEY KNOX BOULEVARD
(STA 10+00.00 – STA 20+37.21)
URBAN ARTERIAL HIGHWAY – STD. NO. 91
T.I.=10.0 R VALUE=60
NOT TO SCALE



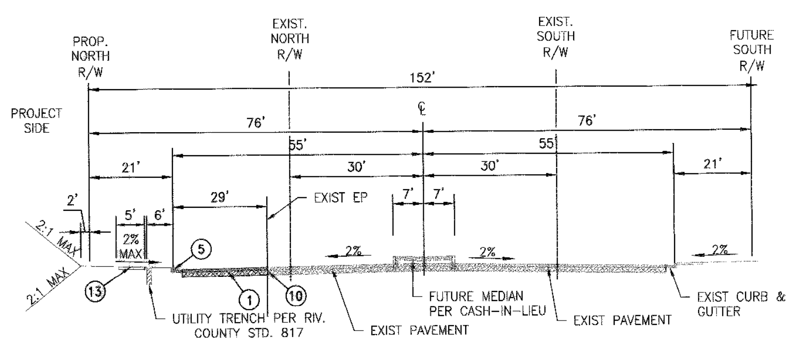
(9) **TYP. EDGE OF PAVEMENT DETAIL**
NOT TO SCALE



CURB RAMP DETAIL "C"
HARLEY KNOX BLVD. & BLANDING WAY
SCALE 1"=10'
REFER TO SHEET 8



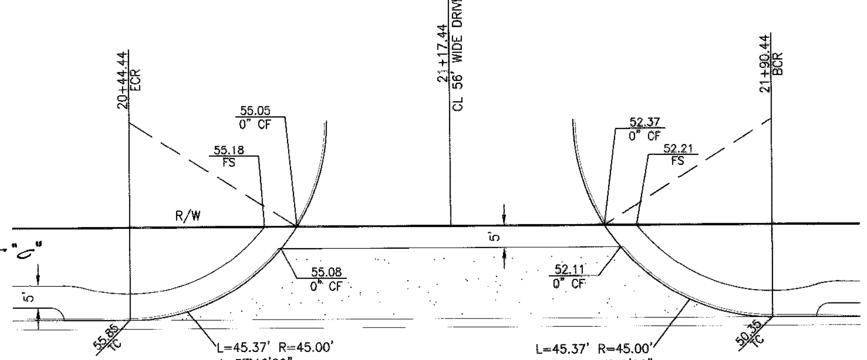
SECTION A–A



HARLEY KNOX BOULEVARD
(STA 20+37.21 – STA 23+27.46)
URBAN ARTERIAL HIGHWAY – STD. NO. 91
T.I.=10.0 R VALUE=60
NOT TO SCALE

MODIFIED SIDEWALK PER CURB RAMP DET "C"

AS BUILT
THESE PLANS REFLECT ANY SUBSTANTIAL DESIGN MODIFICATIONS AS PROVIDED TO WEBB ASSOCIATES BY THE CONTRACTOR
SIGNATURE 3/22/18 DATE
REGISTERED PROFESSIONAL ENGINEER D. J. ARELLANO C 81988 CIVIL STATE OF CALIFORNIA



DRIVEWAY DETAIL "E"
HARLEY KNOX BOULEVARD
STA. 21+17.44
SCALE 1"=20'

AS-BUILT PLAN
CORRECTIONS NOTED
SIGNATURE: 4-5-18

PP 25954
IP 160028

RECMD	COUNTY OVERSIGHT ENGINEER	REGISTRATION	DATE SIGNED
		45702	1-5-17

APPROVED AS TO COMPLIANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

DIGALERT
DIAL BEFORE YOU DIG
TWO WORKING DAYS BEFORE YOU DIG
TOLL FREE 1-800-227-2600
A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

NOTE:
WORK CONTAINED WITHIN THESE PLANS SHALL NOT COMMENCE UNTIL AN ENCROACHMENT PERMIT AND/OR A GRADING PERMIT HAS BEEN ISSUED.

THE PRIVATE ENGINEER SIGNING THESE PLANS IS RESPONSIBLE FOR ASSURING THE ACCURACY AND ACCEPTABILITY OF THE DESIGN HEREON. IN THE EVENT OF DISCREPANCIES ARISING AFTER COUNTY APPROVAL OR DURING CONSTRUCTION, THE PRIVATE ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY THE COUNTY.

MARK	BY	DATE	REVISIONS	APPR.	DATE
ENGINEER				COUNTY	

SEAL – ENGINEER
REGISTERED PROFESSIONAL ENGINEER D.J. ARELLANO NO. 81988 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
ENGINEERING CONSULTANTS
3788 McCRAY STREET
RIVERSIDE CA. 92506
PH. (951) 686-1070

PREPARED UNDER THE SUPERVISION OF:
D.J. ARELLANO
DESIGNED BY: MS CHECKED BY: SA
R.C.E. NO.: 81988
11/1/16 DATE

BENCHMARK:
SEE SHEET 1

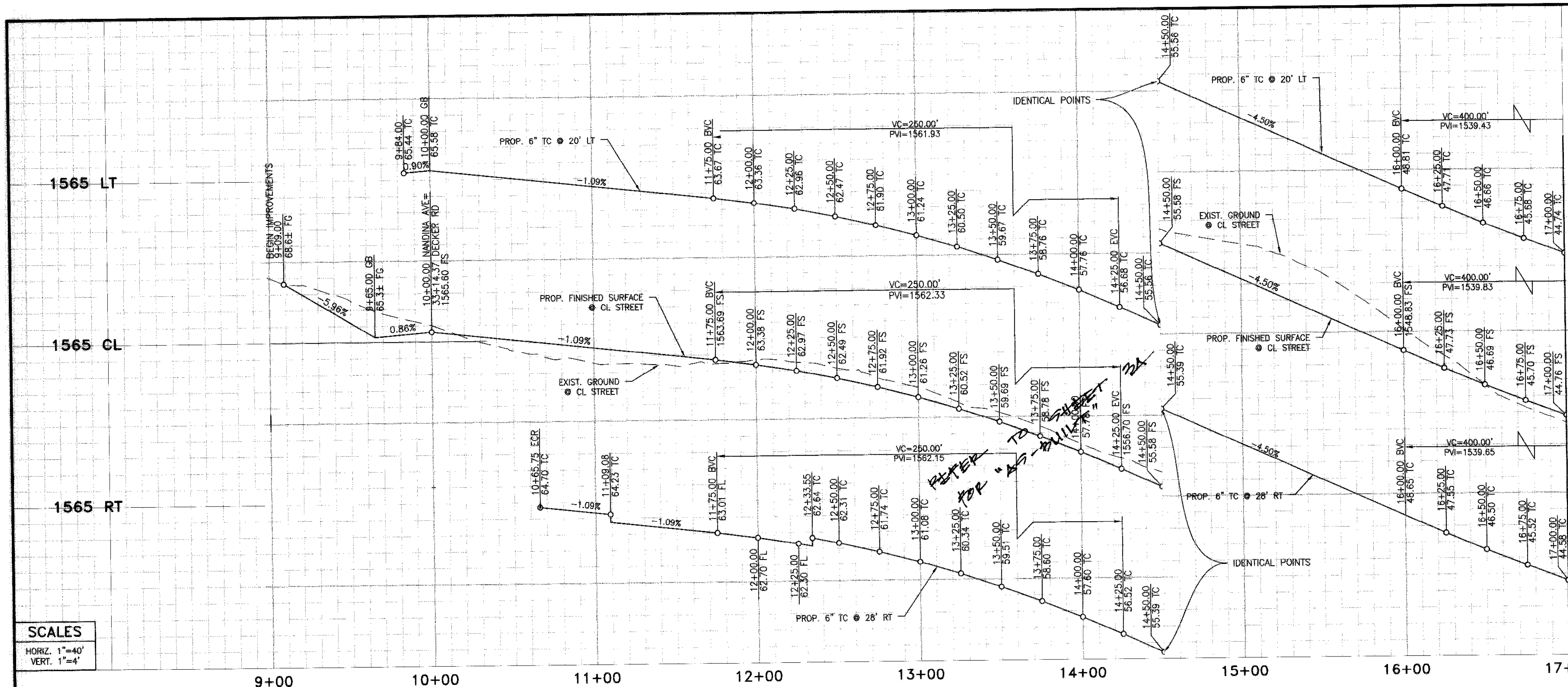
SCALE:
H: AS SHOWN V: N/A

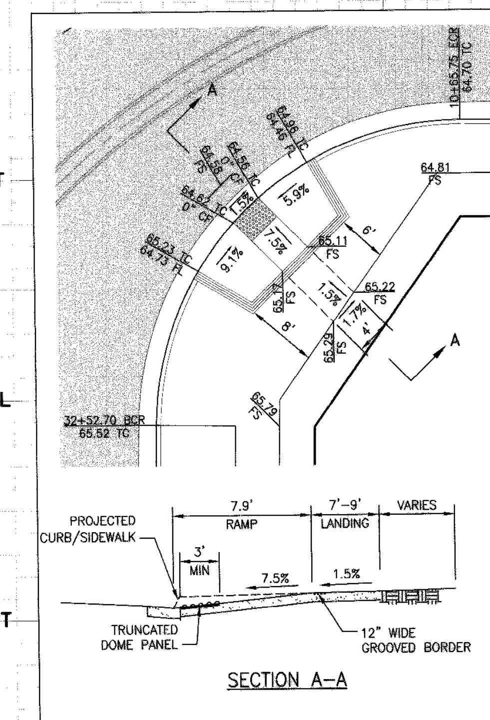
COUNTY OF RIVERSIDE
PLOT PLAN NO. 25954
NANDINA BUSINESS CENTER
STREET IMPROVEMENT PLAN
STREET SECTIONS AND DRIVEWAY DETAILS

FOR: TRAMMELL CROW COMPANY
W.O. 2015–0324
COUNTY FILE NO. 964B

SHEET NO. 2 OF 10 SHEETS

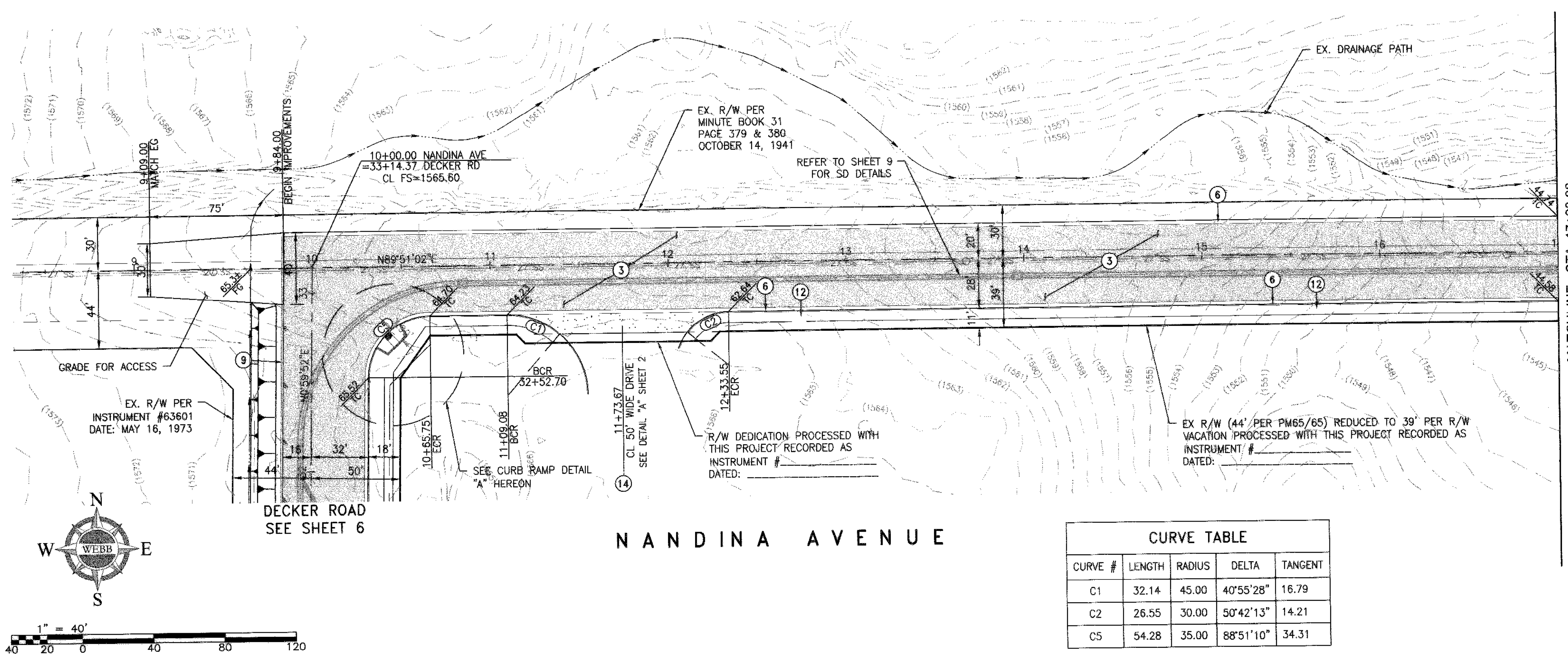
G:\2015\15-0324\DRAWINGS\DESIGN (DD)\15-0324-C-ST.DWG 10/28/2016 11:10 AM





CURB RAMP DETAIL "A"
NANDINA AVE AND DECKER RD
1"=10'

DESIGN SPEED: 40 MPH



CONSTRUCTION NOTES

1. CONSTRUCT MINIMUM 0.53' AC OVER 0.5' AB CLASS II
2. CONSTRUCT MINIMUM 0.43' AC OVER 0.50' AB CLASS II
3. CONSTRUCT 0.39' AC OVER 0.50 AB CLASS II
4. INTENTIONALLY LEFT BLANK
5. CONSTRUCT TYPE "A-8" CURB & GUTTER PER RIV. CO. STD. NO. 201
6. CONSTRUCT TYPE "A-6" CURB & GUTTER PER RIV. CO. STD. NO. 200
7. CONSTRUCT CONCRETE APRON AND TRANSITION PER DETAIL ON SHEET 10
8. CONSTRUCT CONCRETE PIPE INLET TYPE GCP PER CALTRANS STD D75B MODIFIED TO 48" RISER PER DETAIL ON SHEET 10
9. CONSTRUCT 1.0' CLASS II AB @ EP PER TYP. EDGE OF PAVEMENT DETAIL ON SHEET 2
10. SAWCUT & JOIN EX. AC PAVEMENT PER DETAIL ON SHEET 2
11. CONSTRUCT CURB RAMP CASE "A" OR "B" (MODIFIED) PER. RIV. CO. STD. NO. 403
12. CONSTRUCT 6' SIDEWALK AT CURB PER RIV. CO. STD. NO. 401
13. CONSTRUCT 5' MEANDERING SIDEWALK PER RIV. CO. STD. NO. 404
14. CONSTRUCT COMMERCIAL DRIVEWAY APPROACH PER RIV. CO. STD. 207A
15. REMOVE EX. AC PAVEMENT
16. SAWCUT & REMOVE EX. CURB & GUTTER
17. ADJUST TO GRADE
18. PROTECTECT IN PLACE

SUPERCEDED BY SHEET 3A FOR AS-BUILT

AS BUILT
THESE PLANS REFLECT ANY SUBSTANTIAL DESIGN MODIFICATIONS AS PROVIDED TO WEBB ASSOCIATES BY THE CONTRACTOR
SIGNATURE — DATE 3/22/18
REGISTERED PROFESSIONAL ENGINEER D. J. ARELLANO C 81988 CIVIL STATE OF CALIFORNIA

CURVE TABLE				
CURVE #	LENGTH	RADIUS	DELTA	TANGENT
C1	32.14	45.00	40°55'28"	16.79
C2	26.55	30.00	50°42'13"	14.21
C5	54.28	35.00	88°51'10"	34.31

PP 25954 IP 160028

RECMD	COUNTY OVERSIGHT ENGINEER	REGISTRATION	DATE SIGNED
2	Alan French	45702	1-5-17

APPROVED AS TO COMPLIANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

DIGALERT — DIAL BEFORE YOU DIG — TWO WORKING DAYS BEFORE YOU DIG — TOLL FREE 1-800-227-2600 — A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

NOTE:
WORK CONTAINED WITHIN THESE PLANS SHALL NOT COMMENCE UNTIL AN ENCROACHMENT PERMIT AND/OR A GRADING PERMIT HAS BEEN ISSUED.

THE PRIVATE ENGINEER SIGNING THESE PLANS IS RESPONSIBLE FOR ASSURING THE ACCURACY AND ACCEPTABILITY OF THE DESIGN HEREON. IN THE EVENT OF DISCREPANCIES ARISING AFTER COUNTY APPROVAL OR DURING CONSTRUCTION, THE PRIVATE ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY THE COUNTY.

MARK	BY	DATE	REVISIONS	APPR.	DATE
△			See Sheet 3A	mm	4-5-18

ENGINEER — COUNTY

SEAL - ENGINEER: REGISTERED PROFESSIONAL ENGINEER D.J. ARELLANO NO. 81988 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
ENGINEERING CONSULTANTS
3788 McCRAY STREET
RIVERSIDE CA. 92506
PH. (951) 686-1070

PREPARED UNDER THE SUPERVISION OF: D.J. ARELLANO
DESIGNED BY: MS CHECKED BY: SA
R.C.E. NO.: 81988
DATE 11/1/16

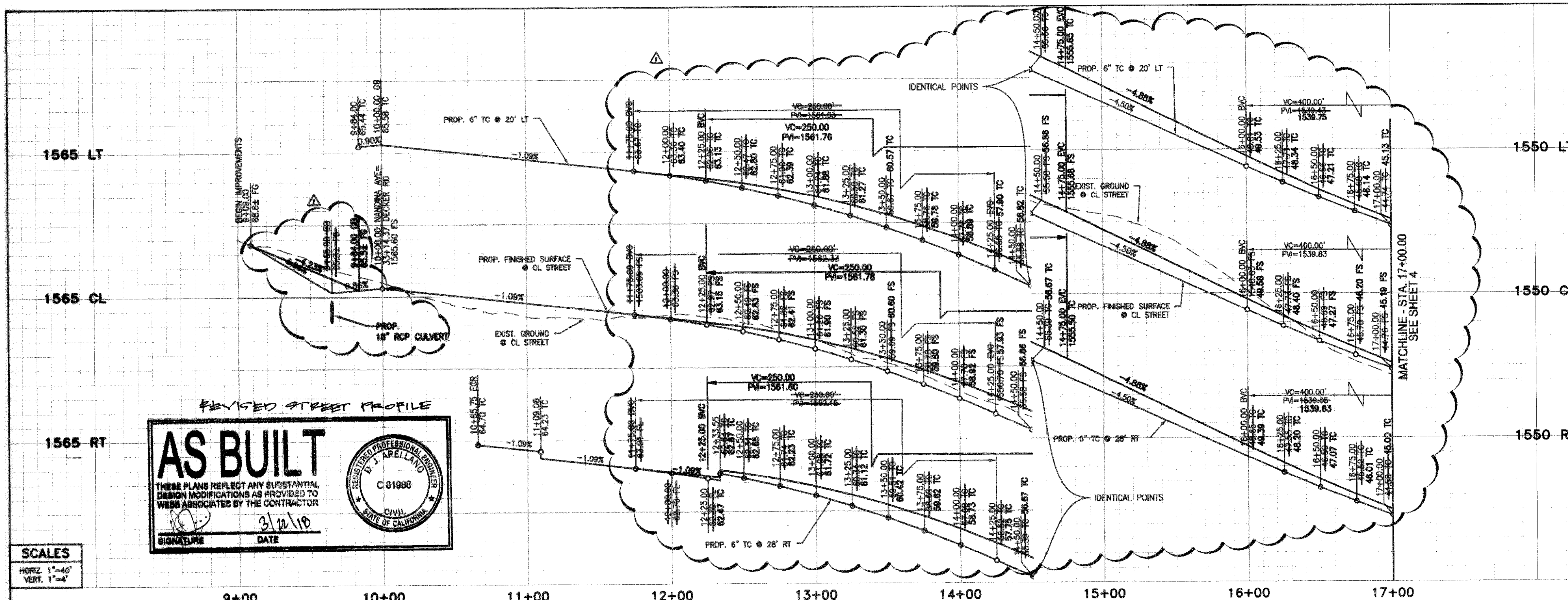
BENCHMARK: SEE SHEET 1
SCALE: H: AS SHOWN V: N/A

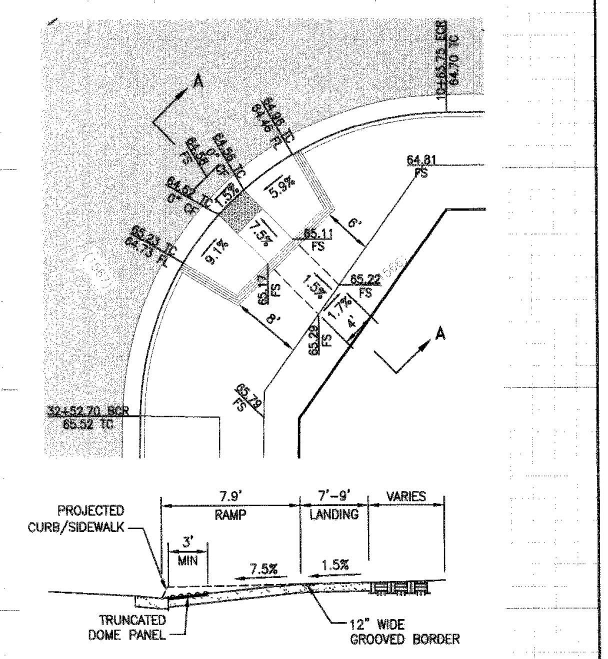
COUNTY OF RIVERSIDE
PLOT PLAN NO. 25954
NANDINA BUSINESS CENTER
STREET IMPROVEMENT PLAN
PLAN SHEET

FOR: TRAMMELL CROW COMPANY
W.O. 2015-0324
COUNTY FILE NO. 964B

SHEET NO. 3 OF 10 SHEETS

G:\2015\15-0324\DRAWINGS\DESIGN (DD)\15-0324-C-ST.DWG 10/28/2016 11:12 AM





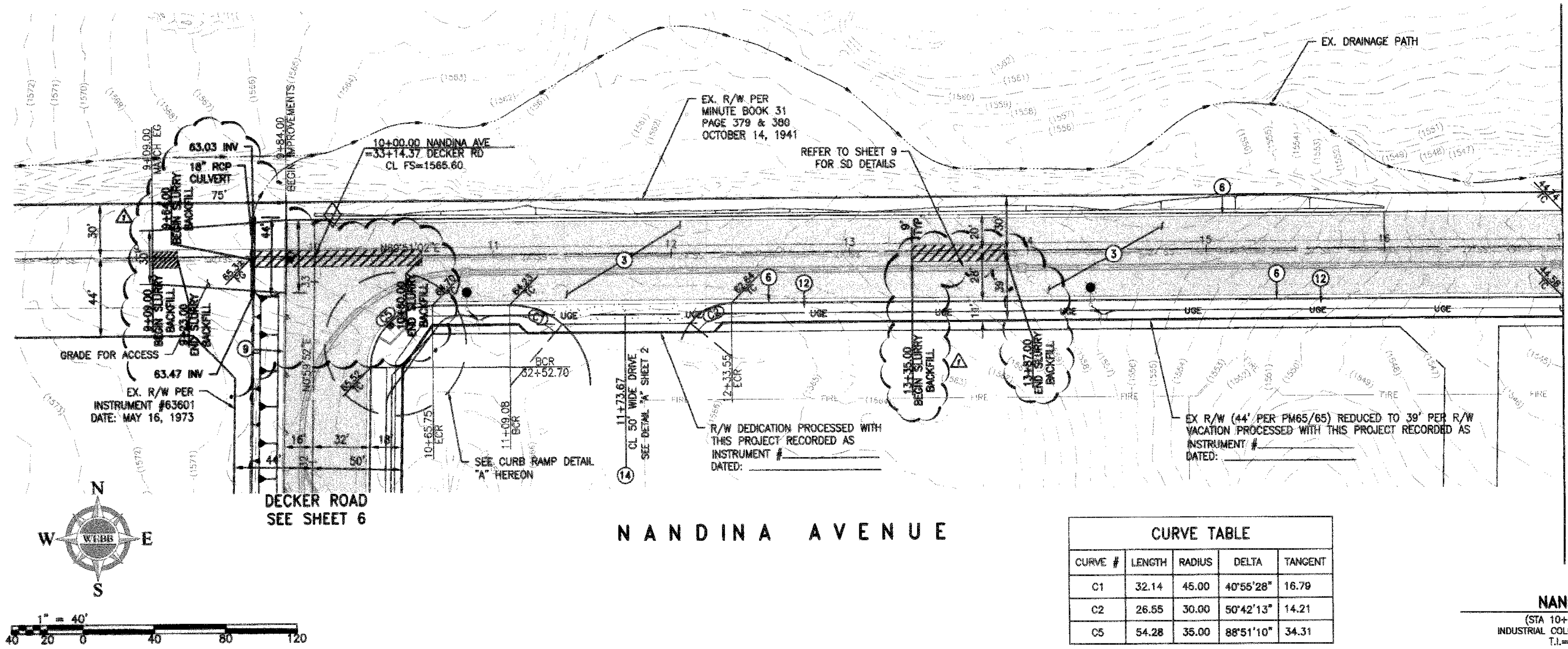
SECTION A-A

CURB RAMP DETAIL "A"
NANDINA AVE AND DECKER RD
1"=10'

DESIGN SPEED: 40 MPH

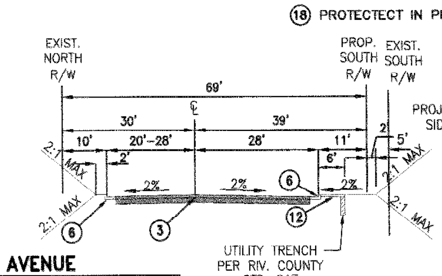
CONSTRUCTION NOTES

1. CONSTRUCT MINIMUM 0.53' AC OVER 0.5' AB CLASS II
2. CONSTRUCT MINIMUM 0.43' AC OVER 0.50' AB CLASS II
3. CONSTRUCT 0.39' AC OVER 0.50 AB CLASS II
4. INTENTIONALLY LEFT BLANK
5. CONSTRUCT TYPE "A-8" CURB & GUTTER PER RIV. CO. STD. NO. 201
6. CONSTRUCT TYPE "A-6" CURB & GUTTER PER RIV. CO. STD. NO. 200
7. CONSTRUCT CONCRETE APRON AND TRANSITION PER DETAIL ON SHEET 10
8. CONSTRUCT CONCRETE PIPE INLET TYPE GCP PER CALTRANS STD D75B MODIFIED TO 48" RISER PER DETAIL ON SHEET 10
9. CONSTRUCT 1.0' CLASS II AB @ EP PER TYP. EDGE OF PAVEMENT DETAIL ON SHEET 2
10. SAWCUT & JOIN EX. AC PAVEMENT PER DETAIL ON SHEET 2
11. CONSTRUCT CURB RAMP CASE "A" OR "B" (MODIFIED) PER. RIV. CO. STD. NO. 403
12. CONSTRUCT 6' SIDEWALK AT CURB PER RIV. CO. STD. NO. 401
13. CONSTRUCT 5' MEANDERING SIDEWALK PER RIV. CO. STD. NO. 404
14. CONSTRUCT COMMERCIAL DRIVEWAY APPROACH PER RIV. CO. STD. 207A
15. REMOVE EX. AC PAVEMENT
16. SAWCUT & REMOVE EX. CURB & GUTTER
17. ADJUST TO GRADE
18. PROTECTECT IN PLACE



CURVE #	LENGTH	RADIUS	DELTA	TANGENT
C1	32.14	45.00	40°55'28"	16.79
C2	26.55	30.00	50°42'13"	14.21
C5	54.28	35.00	88°51'10"	34.31

CURVE TABLE



NANDINA AVENUE
(STA 10+00.00 - STA 23+29.37)
INDUSTRIAL COLLECTOR ROAD - STD. NO. 111
T.I.=8.0 R VALUE=60
NOT TO SCALE

AS-BUILT PLAN
CORRECTIONS NOTED
SIGNATURE: 4-5-18

PP 25954 IP 160028

RECMD | COUNTY OVERSIGHT ENGINEER | REGISTRATION | DATE SIGNED

APPROVED AS TO COMPLIANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

DIGALERT
DIAL BEFORE YOU DIG — TWO WORKING DAYS BEFORE YOU DIG
TOLL FREE 1-800-227-2600
A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

NOTE:
WORK CONTAINED WITHIN THESE PLANS SHALL NOT COMMENCE UNTIL AN ENCROACHMENT PERMIT AND/OR A GRADING PERMIT HAS BEEN ISSUED.

THE PRIVATE ENGINEER SIGNING THESE PLANS IS RESPONSIBLE FOR ASSURING THE ACCURACY AND ACCEPTABILITY OF THE DESIGN HEREON. IN THE EVENT OF DISCREPANCIES ARISING AFTER COUNTY APPROVAL OR DURING CONSTRUCTION, THE PRIVATE ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY THE COUNTY.

MARK	BY	DATE	REVISIONS	APPR.	DATE
1	EJA	8/22/17	REVISED CENTERLINE AND CURB PROFILES, ADDED 18" RCP CULVERT, ADDED SLURRY BACKFILL FOR EX SEWER COVER		
	ENGINEER			COUNTY	

SEAL - ENGINEER
D.J. ARELLANO NO. 81988 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
ENGINEERING CONSULTANTS
3788 McCRAY STREET
RIVERSIDE CA. 92506
PH. (951) 686-1070

PREPARED UNDER THE SUPERVISION OF: D.J. ARELLANO
DESIGNED BY: ____ CHECKED BY: ____
R.C.E. NO.: 81988
DATE

BENCHMARK:
SEE SHEET 1

SCALE:
H: AS SHOWN V: N/A

COUNTY OF RIVERSIDE
PLOT PLAN NO. 25954
NANDINA BUSINESS CENTER
STREET IMPROVEMENT PLAN
PLAN SHEET

FOR: TRAMMELL CROW COMPANY
W.O. 2015-0324
COUNTY FILE NO. 9164 B

SHEET NO. 3A OF 10 SHEETS

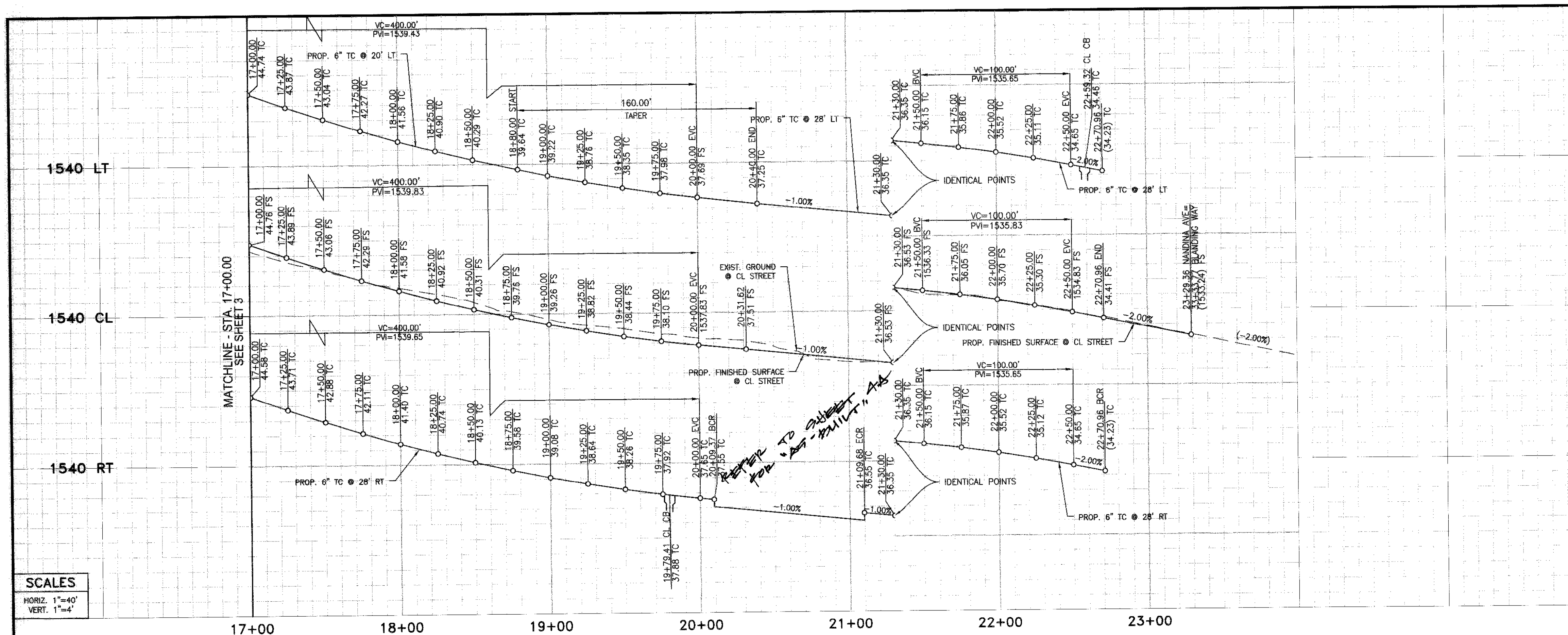
SUPERSEDED BY SHEET 4A FOR AS-BUILT

AS BUILT

THESE PLANS REFLECT ANY SUBSTANTIAL DESIGN MODIFICATIONS AS PROVIDED TO WEBB ASSOCIATES BY THE CONTRACTOR

SIGNATURE 3/22/18 DATE

D. J. ARELLANO C 81988 CIVIL STATE OF CALIFORNIA

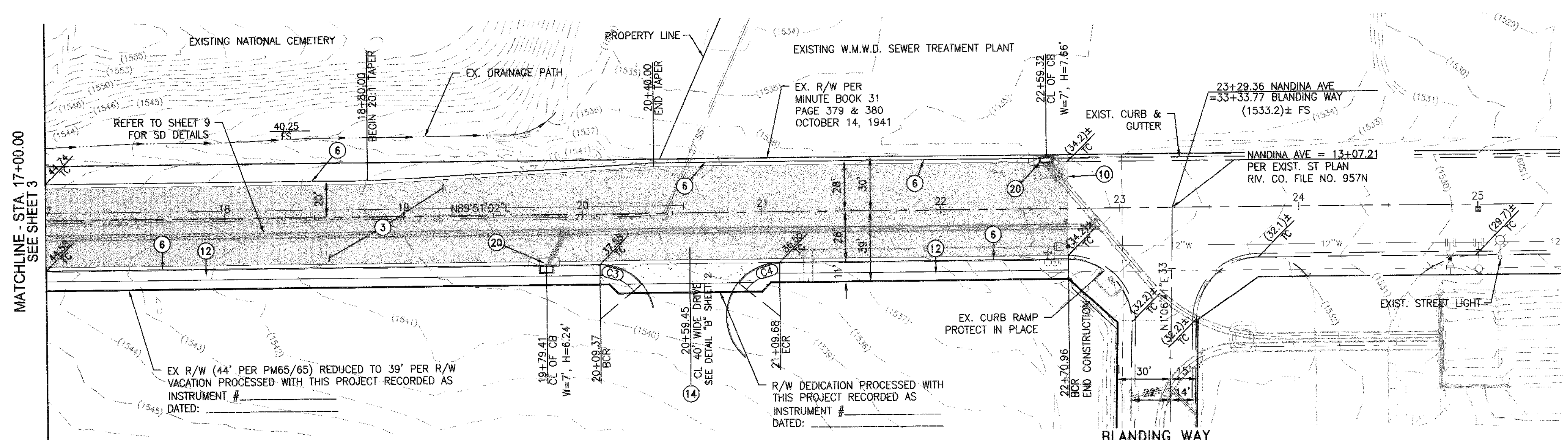


SCALES
HORIZ. 1"=40'
VERT. 1"=4'

DESIGN SPEED: 40 MPH

CONSTRUCTION NOTES

1. CONSTRUCT MINIMUM 0.53' AC OVER 0.5' AB CLASS II
2. CONSTRUCT MINIMUM 0.43' AC OVER 0.50' AB CLASS II
3. CONSTRUCT 0.39' AC OVER 0.50 AB CLASS II
4. INTENTIONALLY LEFT BLANK
5. CONSTRUCT TYPE "A-8" CURB & GUTTER PER RIV. CO. STD. NO. 201
6. CONSTRUCT TYPE "A-6" CURB & GUTTER PER RIV. CO. STD. NO. 200
7. CONSTRUCT CONCRETE APRON AND TRANSITION PER DETAIL ON SHEET 10
8. CONSTRUCT CONCRETE PIPE INLET TYPE GCP PER CALTRANS STD D75B MODIFIED TO 48" RISER PER DETAIL ON SHEET 10
9. CONSTRUCT 1.0' CLASS II AB @ EP PER TYP. EDGE OF PAVEMENT DETAIL ON SHEET 2
10. SAWCUT & JOIN EX. AC PAVEMENT PER DETAIL ON SHEET 2
11. CONSTRUCT CURB RAMP CASE "A" OR "B" (MODIFIED) PER. RIV. CO. STD. NO. 403
12. CONSTRUCT 6' SIDEWALK AT CURB PER RIV. CO. STD. NO. 401
13. CONSTRUCT 5' MEANDERING SIDEWALK PER RIV. CO. STD. NO. 404
14. CONSTRUCT COMMERCIAL DRIVEWAY APPROACH PER RIV. CO. STD. 207A
15. REMOVE EX. AC PAVEMENT
16. SAWCUT & REMOVE EX. CURB & GUTTER
17. ADJUST TO GRADE
18. PROTECTECT IN PLACE
19. CONSTRUCT CONCRETE COLLAR PER RCFC&WCD STD. NO. M803
20. CONSTRUCT CURB INLET CATCH BASIN WITH FOSSIL FILTER AND LOCAL DEPRESSION PER RIV. CO. STD. 300, 300A, & 311. USE SPECIAL CONNECTIONS PER RCFC&WCD STD NO. CB109 FOR CORNER CONNECTIONS



NANDINA AVENUE

CURVE TABLE				
CURVE #	LENGTH	RADIUS	DELTA	TANGENT
C3	26.55	30.00	50°42'12"	14.21
C4	26.55	30.00	50°42'13"	14.21

1" = 40'

PP 25954 IP 160028

RECMD	COUNTY OVERSIGHT ENGINEER	REGISTRATION	DATE SIGNED
	Alan French	45702	1-5-17

APPROVED AS TO COMPLIANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

DIGALERT — DIAL BEFORE YOU DIG — TWO WORKING DAYS BEFORE YOU DIG — TOLL FREE 1-800-227-2600 — A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

NOTE:
WORK CONTAINED WITHIN THESE PLANS SHALL NOT COMMENCE UNTIL AN ENCROACHMENT PERMIT AND/OR A GRADING PERMIT HAS BEEN ISSUED.

THE PRIVATE ENGINEER SIGNING THESE PLANS IS RESPONSIBLE FOR ASSURING THE ACCURACY AND ACCEPTABILITY OF THE DESIGN HEREON. IN THE EVENT OF DISCREPANCIES ARISING AFTER COUNTY APPROVAL OR DURING CONSTRUCTION, THE PRIVATE ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY THE COUNTY.

MARK	BY	DATE	REVISIONS	APPR.	DATE
△			See Sheet 4A		
ENGINEER				COUNTY	

SEAL - ENGINEER: D.J. ARELLANO NO. 81988 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES — ENGINEERING CONSULTANTS, 3788 McCRAY STREET, RIVERSIDE CA. 92506, PH. (951) 686-1070

PREPARED UNDER THE SUPERVISION OF: D.J. ARELLANO

DESIGNED BY: MS CHECKED BY: SA

R.C.E. NO.: 81988 11/1/16 DATE

BENCHMARK: SEE SHEET 1

SCALE: H: AS SHOWN V: N/A

COUNTY OF RIVERSIDE

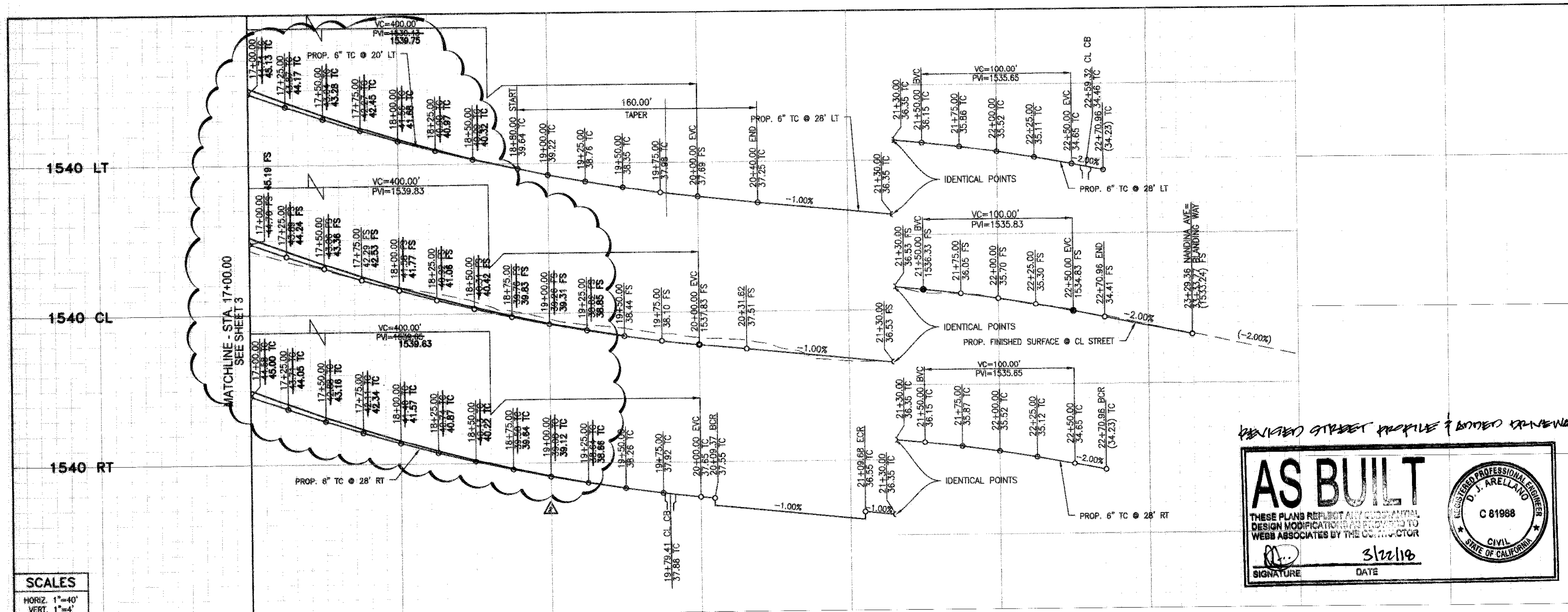
PLOT PLAN NO. 25954

NANDINA BUSINESS CENTER
STREET IMPROVEMENT PLAN
PLAN SHEET

FOR: TRAMMELL CROW COMPANY — W.O. 2015-0324 — COUNTY FILE NO. 964B

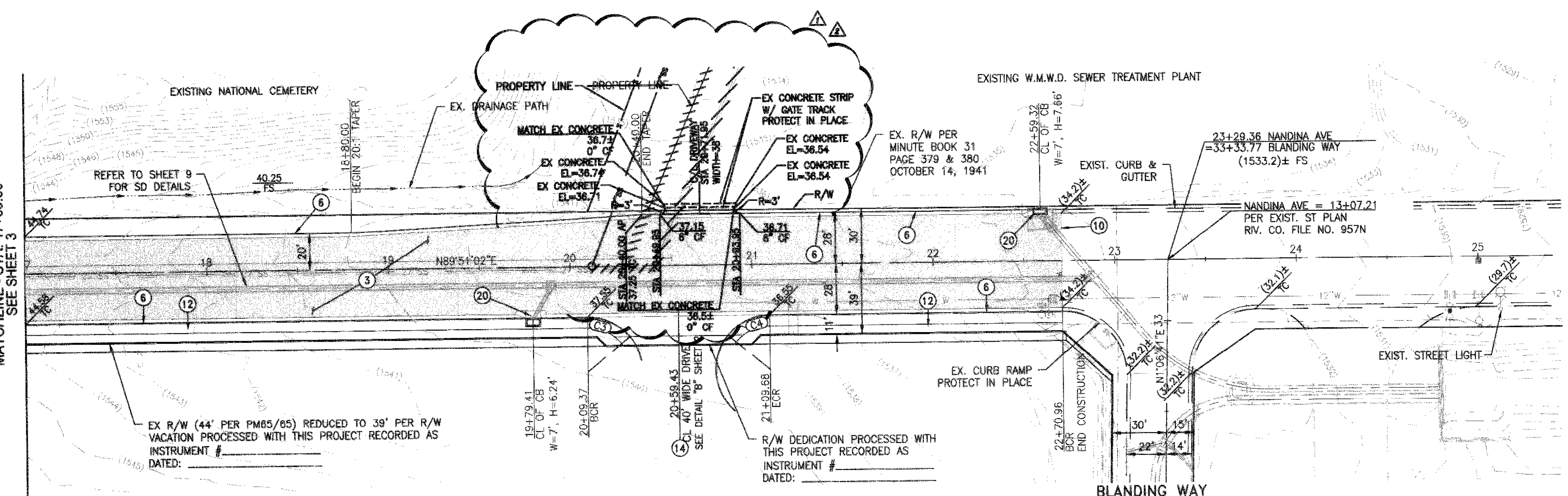
SHEET NO. 4 OF 10 SHEETS

G:\2015\15-0324\DRAWINGS\DESIGN (DD)\15-0324-C-ST.DWG 10/28/2016 11:12 AM



AS BUILT
THESE PLANS REFLECT ANY SUBSTANTIAL DESIGN MODIFICATIONS AS REPORTED TO WEBB ASSOCIATES BY THE CONTRACTOR
SIGNATURE 3/22/18 DATE
REGISTERED PROFESSIONAL ENGINEER D. J. ARELLANO C 81988 CIVIL STATE OF CALIFORNIA

SCALES
HORIZ. 1"=40'
VERT. 1"=4'



NANDINA AVENUE

1" = 40'

CONSTRUCTION NOTES

1. CONSTRUCT MINIMUM 0.53' AC OVER 0.5' AB CLASS II
2. CONSTRUCT MINIMUM 0.43' AC OVER 0.50' AB CLASS II
3. CONSTRUCT 0.39' AC OVER 0.50 AB CLASS II
4. INTENTIONALLY LEFT BLANK
5. CONSTRUCT TYPE "A-8" CURB & GUTTER PER RIV. CO. STD. NO. 201
6. CONSTRUCT TYPE "A-6" CURB & GUTTER PER RIV. CO. STD. NO. 200
7. CONSTRUCT CONCRETE APRON AND TRANSITION PER DETAIL ON SHEET 10
8. CONSTRUCT CONCRETE PIPE INLET TYPE GCP PER CALTRANS STD D75B MODIFIED TO 48" RISER PER DETAIL ON SHEET 10
9. CONSTRUCT 1.0' CLASS II AB @ EP PER TYP. EDGE OF PAVEMENT DETAIL ON SHEET 2
10. SAWCUT & JOIN EX. AC PAVEMENT PER DETAIL ON SHEET 2
11. CONSTRUCT CURB RAMP CASE "A" OR "B" (MODIFIED) PER. RIV. CO. STD. NO. 403
12. CONSTRUCT 6' SIDEWALK AT CURB PER RIV. CO. STD. NO. 401
13. CONSTRUCT 5' MEANDERING SIDEWALK PER RIV. CO. STD. NO. 404
14. CONSTRUCT COMMERCIAL DRIVEWAY APPROACH PER RIV. CO. STD. 207A
15. REMOVE EX. AC PAVEMENT
16. SAWCUT & REMOVE EX. CURB & GUTTER
17. ADJUST TO GRADE
18. PROTECTECT IN PLACE
19. CONSTRUCT CONCRETE COLLAR PER RCFC&WCD STD. NO. M803
20. CONSTRUCT CURB INLET CATCH BASIN WITH FOSSIL FILTER AND LOCAL DEPRESSION PER RIV. CO. STD. 300, 300A, & 311. USE SPECIAL CONNECTIONS PER RCFC&WCD STD NO. CB109 FOR CORNER CONNECTIONS

CURVE TABLE

CURVE #	LENGTH	RADIUS	DELTA	TANGENT
C3	26.55	30.00	50°42'12"	14.21
C4	26.55	30.00	50°42'13"	14.21

AS-BUILT PLAN
CORRECTIONS NOTED 1 & 2
SIGNATURE: 4-5-18

PP 25954
IP 160028

DIGALERT
DIAL BEFORE YOU DIG — TWO WORKING DAYS BEFORE YOU DIG
TOLL FREE 1-800-227-2600
A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

NOTE:
WORK CONTAINED WITHIN THESE PLANS SHALL NOT COMMENCE UNTIL AN ENCROACHMENT PERMIT AND/OR A GRADING PERMIT HAS BEEN ISSUED.

THE PRIVATE ENGINEER SIGNING THESE PLANS IS RESPONSIBLE FOR ASSURING THE ACCURACY AND ACCEPTABILITY OF THE DESIGN HEREON. IN THE EVENT OF DISCREPANCIES ARISING AFTER COUNTY APPROVAL OR DURING CONSTRUCTION, THE PRIVATE ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY THE COUNTY.

MARK	BY	DATE	REVISIONS	APPR.	DATE
2	EJA	9/22/17	REVISED CENTERLINE AND CURB PROFILES, REVISED LOCATION OF EX. SEWER LINE		
1	EJA	7/11/17	ADDED DRIVEWAY CUT-OUT STATION 20+71.95		
ENGINEER				COUNTY	

RECMD | COUNTY OVERSIGHT ENGINEER | REGISTRATION | DATE SIGNED
APPROVED AS TO COMPLIANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

SEAL - ENGINEER
REGISTERED PROFESSIONAL ENGINEER D.J. ARELLANO NO. 81988 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
ENGINEERING CONSULTANTS
3788 McCRAY STREET
RIVERSIDE CA. 92506
PH. (951) 686-1070

PREPARED UNDER THE SUPERVISION OF: D.J. ARELLANO
DESIGNED BY: ____ CHECKED BY: ____
R.C.E. NO.: 81988
DATE

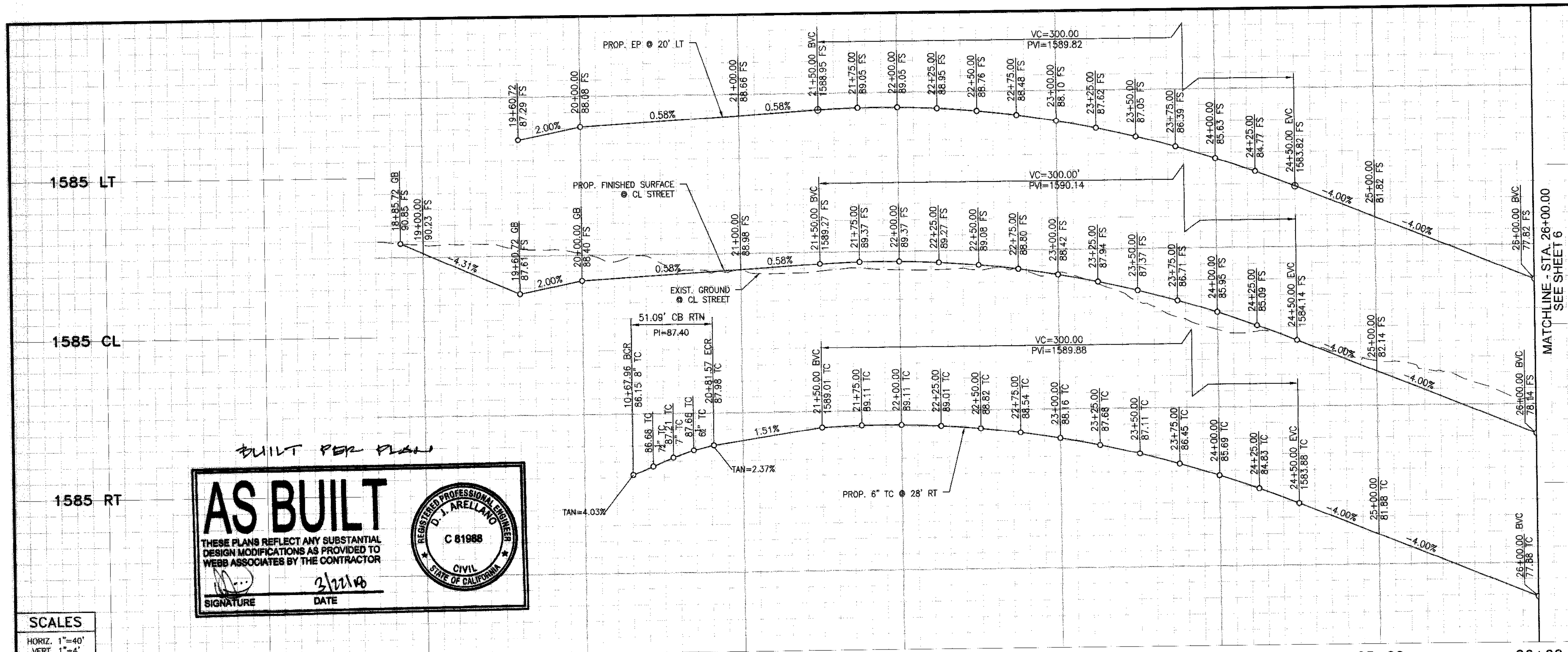
BENCHMARK:
SEE SHEET 1

SCALE:
H: AS SHOWN V: N/A

COUNTY OF RIVERSIDE
PLOT PLAN NO. 25954
NANDINA BUSINESS CENTER
STREET IMPROVEMENT PLAN
PLAN SHEET

FOR: TRAMMELL CROW COMPANY
W.O. 2015-0324
COUNTY FILE NO. 964B

SHEET NO. 4A
OF 10 SHEETS



BUILT PER PLAN

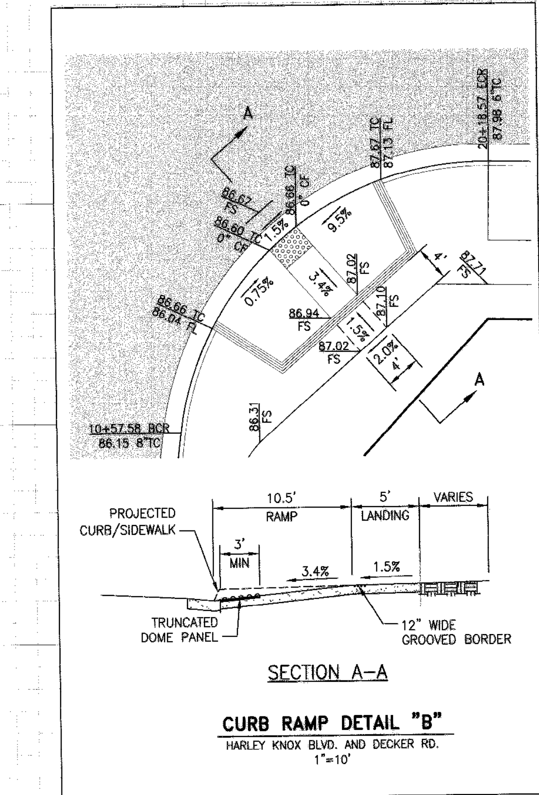
AS BUILT

THESE PLANS REFLECT ANY SUBSTANTIAL DESIGN MODIFICATIONS AS PROVIDED TO WEBB ASSOCIATES BY THE CONTRACTOR

REGISTERED PROFESSIONAL ENGINEER D. J. ARELLANO C 81988 CIVIL STATE OF CALIFORNIA

SIGNATURE DATE 3/22/18

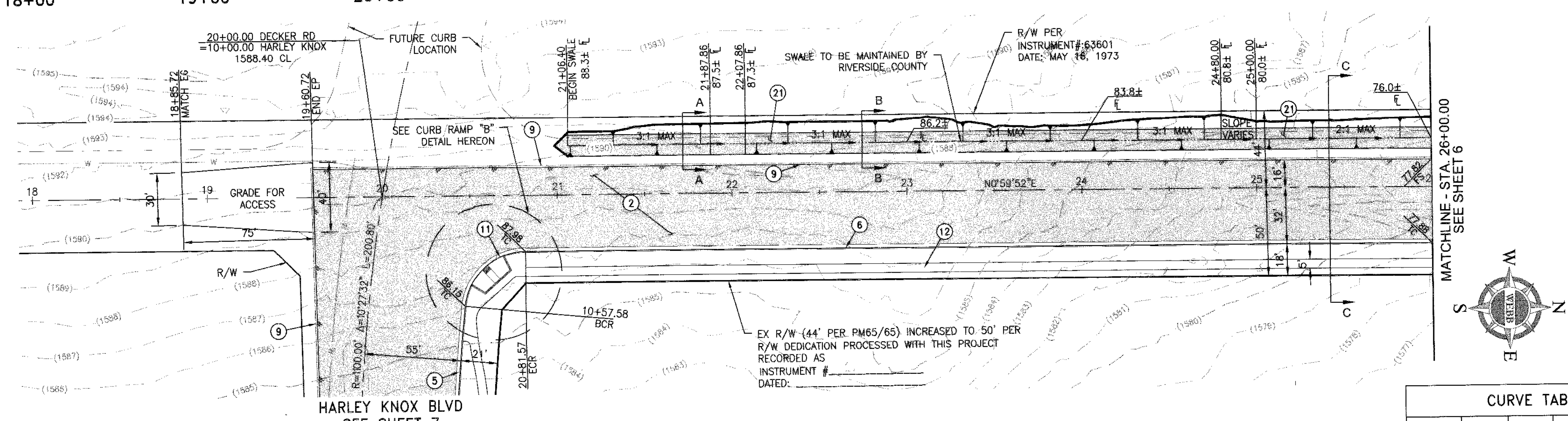
SCALES
HORIZ. 1"=40'
VERT. 1"=4'

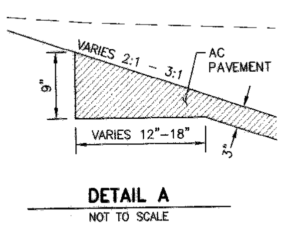


SECTION A–A

CURB RAMP DETAIL "B"
HARLEY KNOX BLVD. AND DECKER RD.
1"=10'

DESIGN SPEED: 40 MPH





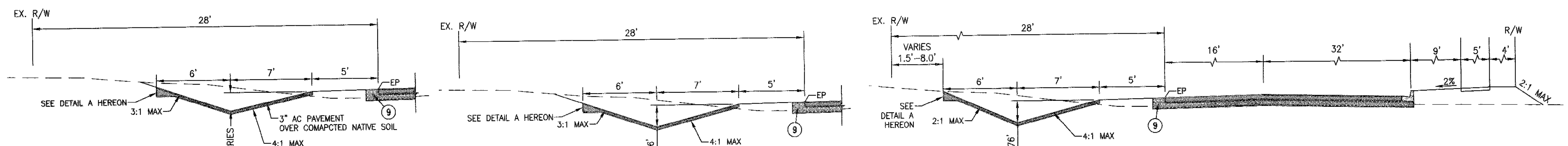
DETAIL A
NOT TO SCALE

CURVE TABLE				
CURVE #	LENGTH	RADIUS	DELTA	TANGENT
C6	51.09	35.00	83°38'30"	31.32

CONSTRUCTION NOTES

1. CONSTRUCT MINIMUM 0.53' AC OVER 0.5' AB CLASS II
2. CONSTRUCT MINIMUM 0.43' AC OVER 0.50' AB CLASS II
3. CONSTRUCT 0.39' AC OVER 0.50 AB CLASS II
4. INTENTIONALLY LEFT BLANK
5. CONSTRUCT TYPE "A–8" CURB & GUTTER PER RIV. CO. STD. NO. 201
6. CONSTRUCT TYPE "A–6" CURB & GUTTER PER RIV. CO. STD. NO. 200
7. CONSTRUCT CONCRETE APRON AND TRANSITION PER DETAIL ON SHEET 10
8. CONSTRUCT CONCRETE PIPE INLET TYPE GCP PER CALTRANS STD D75B MODIFIED TO 48" RISER PER DETAIL ON SHEET 10
9. CONSTRUCT 1.0' CLASS II AB @ EP PER TYP. EDGE OF PAVEMENT DETAIL ON SHEET 2
10. SAWCUT & JOIN EX. AC PAVEMENT PER DETAIL ON SHEET 2
11. CONSTRUCT CURB RAMP CASE "A" OR "B" (MODIFIED) PER. RIV. CO. STD. NO. 403
12. CONSTRUCT 6' SIDEWALK AT CURB PER RIV. CO. STD. NO. 401
13. CONSTRUCT 5' MEANDERING SIDEWALK PER RIV. CO. STD. NO. 404
14. CONSTRUCT COMMERCIAL DRIVEWAY APPROACH PER RIV. CO. STD. 207A
15. REMOVE EX. AC PAVEMENT
16. SAWCUT & REMOVE EX. CURB & GUTTER
17. ADJUST TO GRADE
18. PROTECTECT IN PLACE
19. CONSTRUCT CONCRETE COLLAR PER RCFC&WCD STD. NO. M803
20. CONSTRUCT CURB INLET CATCH BASIN WITH FOSSIL FILTER AND LOCAL DEPRESSION PER RIV. CO. STD. 300, 300A, & 311. USE SPECIAL CONNECTIONS PER RCFC&WCD STD NO. CB109 FOR CORNER CONNECTIONS
21. CONSTRUCT 3" AC PAVEMENT LINED V–DITCH

AS-BUILT PLAN
CORRECTIONS NOTED
SIGNATURE: 1-5-18



SECTION A–A
(STA 21+06.40 – STA 21+87.86)

SECTION B–B
(STA 22+07.86 – STA 24+80.00)

SECTION C–C
(STA 25+00.00 – STA 31+12.36)

1" = 40'

PP 25954 IP 160028

RECMD	COUNTY OVERSIGHT ENGINEER	REGISTRATION	DATE SIGNED
SL	Alan French	45702	1-5-17

APPROVED AS TO COMPLIANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

DIGALERT — DIAL BEFORE YOU DIG — TWO WORKING DAYS BEFORE YOU DIG — TOLL FREE 1-800-227-2600 — A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

NOTE:
WORK CONTAINED WITHIN THESE PLANS SHALL NOT COMMENCE UNTIL AN ENCROACHMENT PERMIT AND/OR A GRADING PERMIT HAS BEEN ISSUED.

THE PRIVATE ENGINEER SIGNING THESE PLANS IS RESPONSIBLE FOR ASSURING THE ACCURACY AND ACCEPTABILITY OF THE DESIGN HEREON. IN THE EVENT OF DISCREPANCIES ARISING AFTER COUNTY APPROVAL OR DURING CONSTRUCTION, THE PRIVATE ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY THE COUNTY.

MARK	BY	DATE	REVISIONS	APPR.	DATE
ENGINEER				COUNTY	

SEAL – ENGINEER: REGISTERED PROFESSIONAL ENGINEER D.J. ARELLANO NO. 81988 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
ENGINEERING CONSULTANTS
3788 McCRAY STREET
RIVERSIDE CA. 92506
PH. (951) 686-1070

PREPARED UNDER THE SUPERVISION OF: D.J. ARELLANO
DESIGNED BY: MS CHECKED BY: JA
R.C.E. NO.: 81988
DATE: 11/1/16

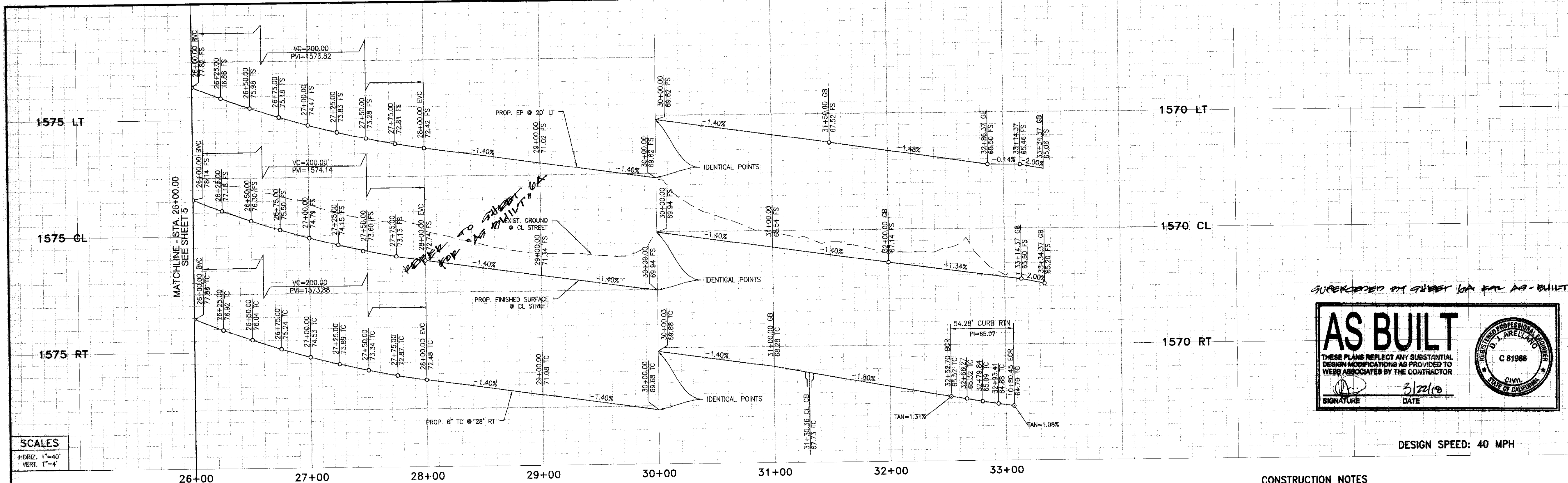
BENCHMARK: SEE SHEET 1
SCALE: H: AS SHOWN V: N/A

COUNTY OF RIVERSIDE
PLOT PLAN NO. 25954
NANDINA BUSINESS CENTER
STREET IMPROVEMENT PLAN
PLAN SHEET

FOR: TRAMMELL CROW COMPANY
W.O. 2015-0324
COUNTY FILE NO. 964B

SHEET NO. 5 OF 10 SHEETS

G:\2015\15-0324\DRAWINGS\DESIGN (00)\15-0324-C-ST.DWG 10/28/2016 11:13 AM

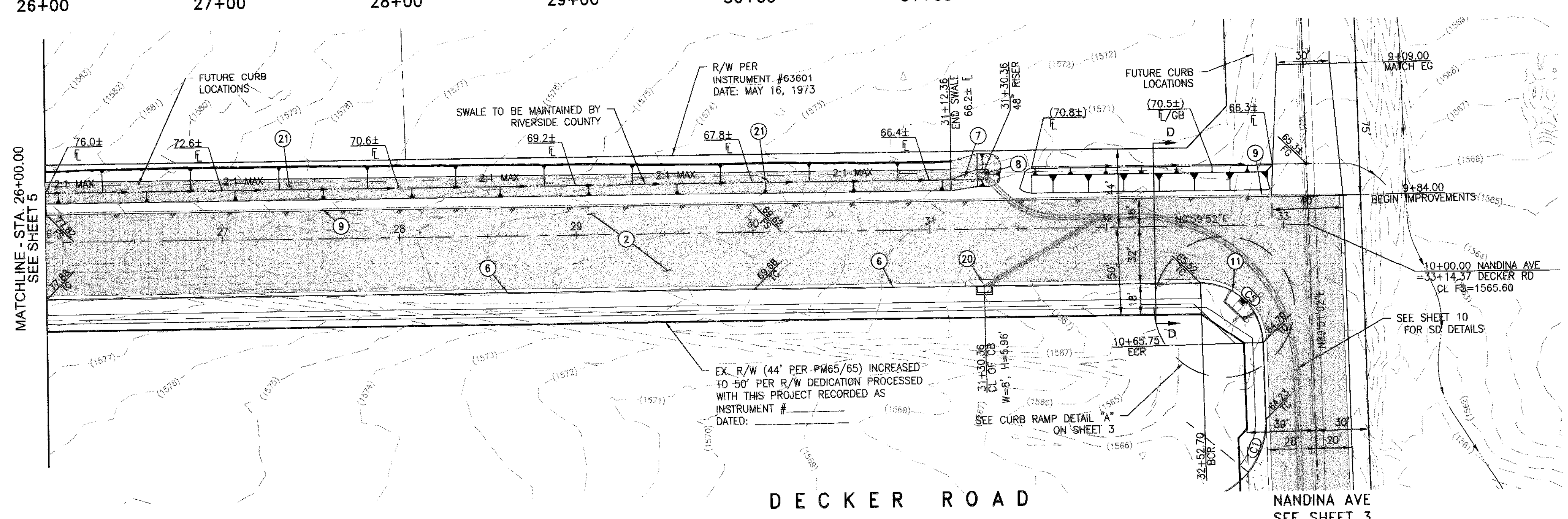


SUPERSEDED BY SHEET 6A FOR AS-BUILT

AS BUILT
THESE PLANS REFLECT ANY SUBSTANTIAL DESIGN MODIFICATIONS AS PROVIDED TO WEBB ASSOCIATES BY THE CONTRACTOR
SIGNATURE — DATE 3/22/18
REGISTERED PROFESSIONAL ENGINEER D. J. ARELLANO C 81988 CIVIL STATE OF CALIFORNIA

SCALES
HORIZ. 1"=40'
VERT. 1"=4'

DESIGN SPEED: 40 MPH

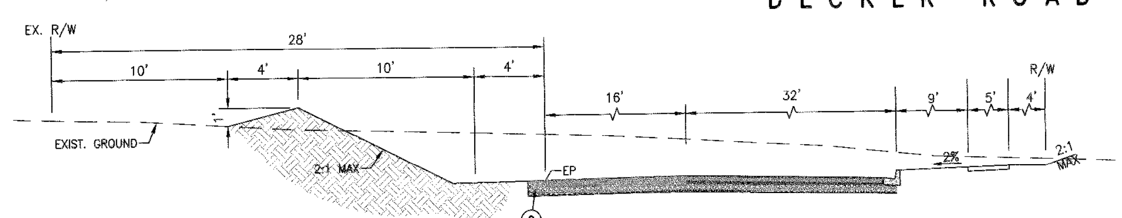


DECKER ROAD

NANDINA AVE
SEE SHEET 3

CONSTRUCTION NOTES

1. CONSTRUCT MINIMUM 0.53' AC OVER 0.5' AB CLASS II
2. CONSTRUCT MINIMUM 0.43' AC OVER 0.50' AB CLASS II
3. CONSTRUCT 0.39' AC OVER 0.50 AB CLASS II
4. INTENTIONALLY LEFT BLANK
5. CONSTRUCT TYPE "A-8" CURB & GUTTER PER RIV. CO. STD. NO. 201
6. CONSTRUCT TYPE "A-6" CURB & GUTTER PER RIV. CO. STD. NO. 200
7. CONSTRUCT CONCRETE APRON AND TRANSITION PER DETAIL ON SHEET 10
8. CONSTRUCT CONCRETE PIPE INLET TYPE GCP PER CALTRANS STD D75B MODIFIED TO 48" RISER PER DETAIL ON SHEET 10
9. CONSTRUCT 1.0' CLASS II AB @ EP PER TYP. EDGE OF PAVEMENT DETAIL ON SHEET 2
10. SAWCUT & JOIN EX. AC PAVEMENT PER DETAIL ON SHEET 2
11. CONSTRUCT CURB RAMP CASE "A" OR "B" (MODIFIED) PER. RIV. CO. STD. NO. 403
12. CONSTRUCT 6' SIDEWALK AT CURB PER RIV. CO. STD. NO. 401
13. CONSTRUCT 5' MEANDERING SIDEWALK PER RIV. CO. STD. NO. 404
14. CONSTRUCT COMMERCIAL DRIVEWAY APPROACH PER RIV. CO. STD. 207A
15. REMOVE EX. AC PAVEMENT
16. SAWCUT & REMOVE EX. CURB & GUTTER
17. ADJUST TO GRADE
18. PROTECTECT IN PLACE
19. CONSTRUCT CONCRETE COLLAR PER RCFC&WCD STD. NO. M803
20. CONSTRUCT CURB INLET CATCH BASIN WITH FOSSIL FILTER AND LOCAL DEPRESSION PER RIV. CO. STD. 300, 300A, & 311. USE SPECIAL CONNECTIONS PER RCFC&WCD STD NO. CB109 FOR CORNER CONNECTIONS
21. CONSTRUCT 3" AC PAVEMENT LINED V-DITCH



SECTION D-D
NTS

CURVE TABLE				
CURVE #	LENGTH	RADIUS	DELTA	TANGENT
C5	54.28	35.00	88°51'10"	34.31

AS-BUILT PLAN
CORRECTIONS NOTED See Sh 6A
SIGNATURE: 4-5-18

PP 25954 IP 160028

RECMD SC | COUNTY OVERSIGHT ENGINEER Alan French | REGISTRATION 45702 | DATE SIGNED 1-5-17
APPROVED AS TO COMPLIANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

DIGALERT
DIAL BEFORE YOU DIG — TWO WORKING DAYS BEFORE YOU DIG
TOLL FREE 1-800-227-2600
A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

NOTE:
WORK CONTAINED WITHIN THESE PLANS SHALL NOT COMMENCE UNTIL AN ENCROACHMENT PERMIT AND/OR A GRADING PERMIT HAS BEEN ISSUED.

THE PRIVATE ENGINEER SIGNING THESE PLANS IS RESPONSIBLE FOR ASSURING THE ACCURACY AND ACCEPTABILITY OF THE DESIGN HEREON. IN THE EVENT OF DISCREPANCIES ARISING AFTER COUNTY APPROVAL OR DURING CONSTRUCTION, THE PRIVATE ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY THE COUNTY.

MARK	BY	DATE	REVISIONS	APPR.	DATE
△			See Sheet 6A		
ENGINEER				COUNTY	

SEAL - ENGINEER
REGISTERED PROFESSIONAL ENGINEER D.J. ARELLANO NO. 81988 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
ENGINEERING CONSULTANTS
3788 McCRAY STREET
RIVERSIDE CA. 92506
PH. (951) 686-1070

PREPARED UNDER THE SUPERVISION OF: D.J. ARELLANO
DESIGNED BY: MS CHECKED BY:
R.C.E. NO.: 81988
DATE 11/1/16

BENCHMARK:
SEE SHEET 1

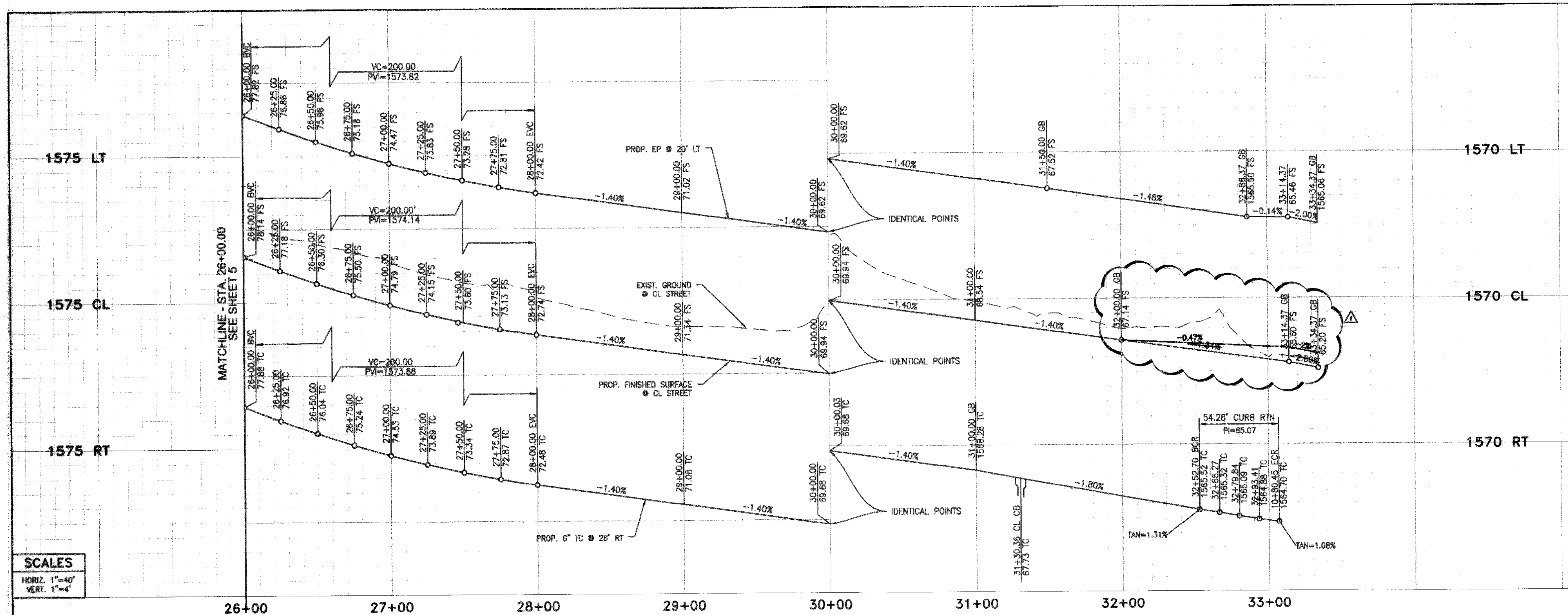
SCALE:
H: AS SHOWN V: N/A

COUNTY OF RIVERSIDE
PLOT PLAN NO. 25954
NANDINA BUSINESS CENTER
STREET IMPROVEMENT PLAN
PLAN SHEET

FOR: TRAMMELL CROW COMPANY
W.O. 2015-0324
COUNTY FILE NO. 964B

SHEET NO. 6
OF 10 SHEETS

G:\2015\15-0324\DRAWINGS\DESIGN (DD)\15-0324-C-ST.DWG 10/31/2016 9:05 AM



MODIFIED STREET PROFILE AS SHOWN

AS BUILT

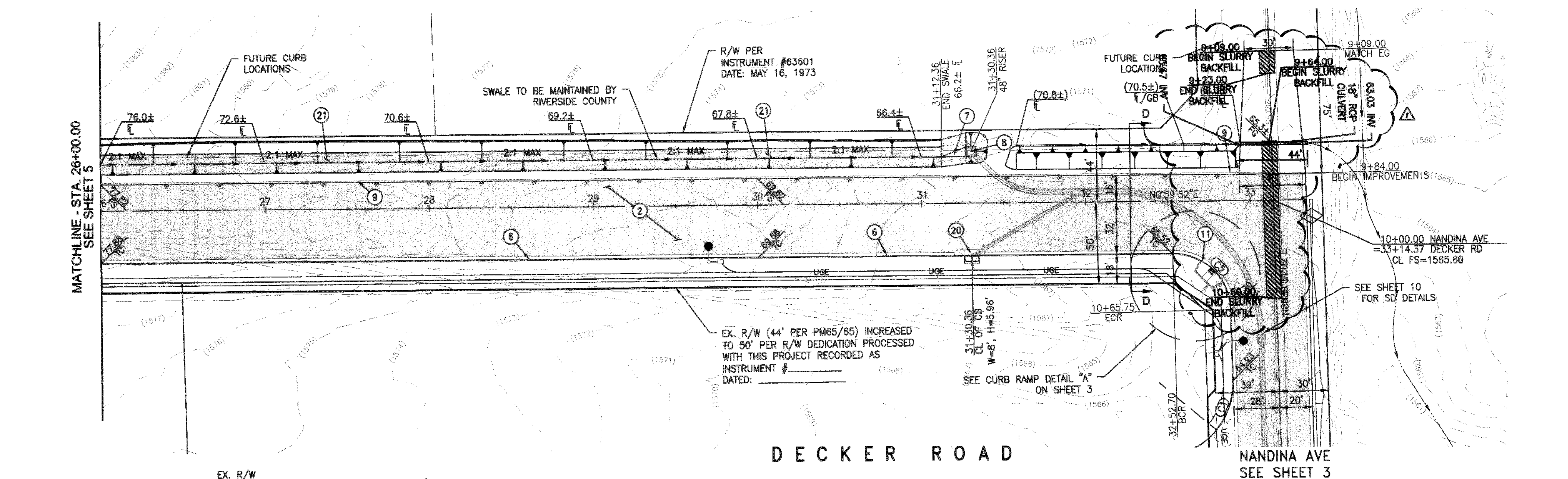
THESE PLANS REFLECT ANY SUBSTANTIAL DESIGN MODIFICATIONS AS PROVIDED TO WEBB ASSOCIATES BY THE CONTRACTOR

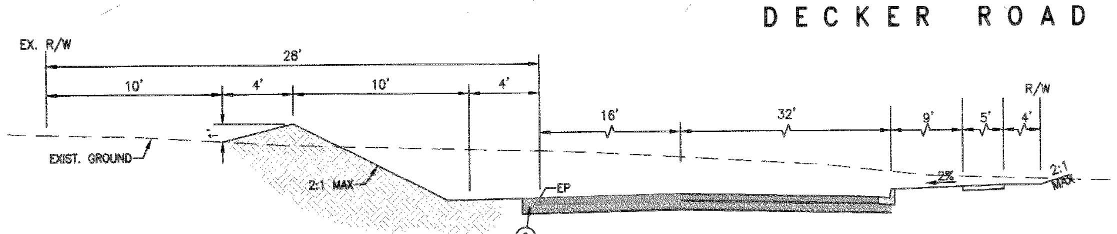
SIGNATURE 3/22/18 DATE

D. J. ARELLANO C 81988 CIVIL STATE OF CALIFORNIA

DESIGN SPEED: 40 MPH

SCALES
HORIZ. 1"=40'
VERT. 1"=4'





SECTION D-D
NTS

1" = 40'

CONSTRUCTION NOTES

1. CONSTRUCT MINIMUM 0.53' AC OVER 0.5' AB CLASS II
2. CONSTRUCT MINIMUM 0.43' AC OVER 0.50' AB CLASS II
3. CONSTRUCT 0.39' AC OVER 0.50 AB CLASS II
4. INTENTIONALLY LEFT BLANK
5. CONSTRUCT TYPE "A-8" CURB & GUTTER PER RIV. CO. STD. NO. 201
6. CONSTRUCT TYPE "A-6" CURB & GUTTER PER RIV. CO. STD. NO. 200
7. CONSTRUCT CONCRETE APRON AND TRANSITION PER DETAIL ON SHEET 10
8. CONSTRUCT CONCRETE PIPE INLET TYPE GCP PER CALTRANS STD D75B MODIFIED TO 48" RISER PER DETAIL ON SHEET 10
9. CONSTRUCT 1.0' CLASS II AB @ EP PER TYP. EDGE OF PAVEMENT DETAIL ON SHEET 2
10. SAWCUT & JOIN EX. AC PAVEMENT PER DETAIL ON SHEET 2
11. CONSTRUCT CURB RAMP CASE "A" OR "B" (MODIFIED) PER. RIV. CO. STD. NO. 403
12. CONSTRUCT 6' SIDEWALK AT CURB PER RIV. CO. STD. NO. 401
13. CONSTRUCT 5' MEANDERING SIDEWALK PER RIV. CO. STD. NO. 404
14. CONSTRUCT COMMERCIAL DRIVEWAY APPROACH PER RIV. CO. STD. 207A
15. REMOVE EX. AC PAVEMENT
16. SAWCUT & REMOVE EX. CURB & GUTTER
17. ADJUST TO GRADE
18. PROTECTECT IN PLACE
19. CONSTRUCT CONCRETE COLLAR PER RCFC&WCD STD. NO. M803
20. CONSTRUCT CURB INLET CATCH BASIN WITH FOSSIL FILTER AND LOCAL DEPRESSION PER RIV. CO. STD. 300, 300A, & 311. USE SPECIAL CONNECTIONS PER RCFC&WCD STD NO. CB109 FOR CORNER CONNECTIONS
21. CONSTRUCT 3" AC PAVEMENT LINED V-DITCH

AS-BUILT PLAN
CORRECTIONS NOTED
SIGNATURE

CURVE TABLE

CURVE #	LENGTH	RADIUS	DELTA	TANGENT
C5	54.28	35.00	88°51'10"	34.31

PP 25954 IP 160028

RECMD	COUNTY OVERSIGHT ENGINEER	REGISTRATION	DATE SIGNED

APPROVED AS TO COMPLIANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

DIGALERT
DIAL BEFORE YOU DIG
TWO WORKING DAYS BEFORE YOU DIG
TOLL FREE 1-800-227-2600
A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

NOTE:
WORK CONTAINED WITHIN THESE PLANS SHALL NOT COMMENCE UNTIL AN ENCROACHMENT PERMIT AND/OR A GRADING PERMIT HAS BEEN ISSUED.

THE PRIVATE ENGINEER SIGNING THESE PLANS IS RESPONSIBLE FOR ASSURING THE ACCURACY AND ACCEPTABILITY OF THE DESIGN HEREON. IN THE EVENT OF DISCREPANCIES ARISING AFTER COUNTY APPROVAL OR DURING CONSTRUCTION, THE PRIVATE ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY THE COUNTY.

MARK	BY	DATE	REVISIONS	APPR.	DATE
1	EJA	8/22/17	REVISED CENTERLINE AND CURB PROFILES, ADDED 18" RCP CULVERT, ADDED SLURRY BACKFILL FOR EX SEWER COVER		
ENGINEER				COUNTY	

SEAL - ENGINEER
D.J. ARELLANO NO. 81988 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
ENGINEERING CONSULTANTS
3788 McCRAY STREET
RIVERSIDE CA. 92506
PH. (951) 686-1070

PREPARED UNDER THE SUPERVISION OF: D.J. ARELLANO
DESIGNED BY: ____ CHECKED BY: ____
R.C.E. NO.: 81988
DATE

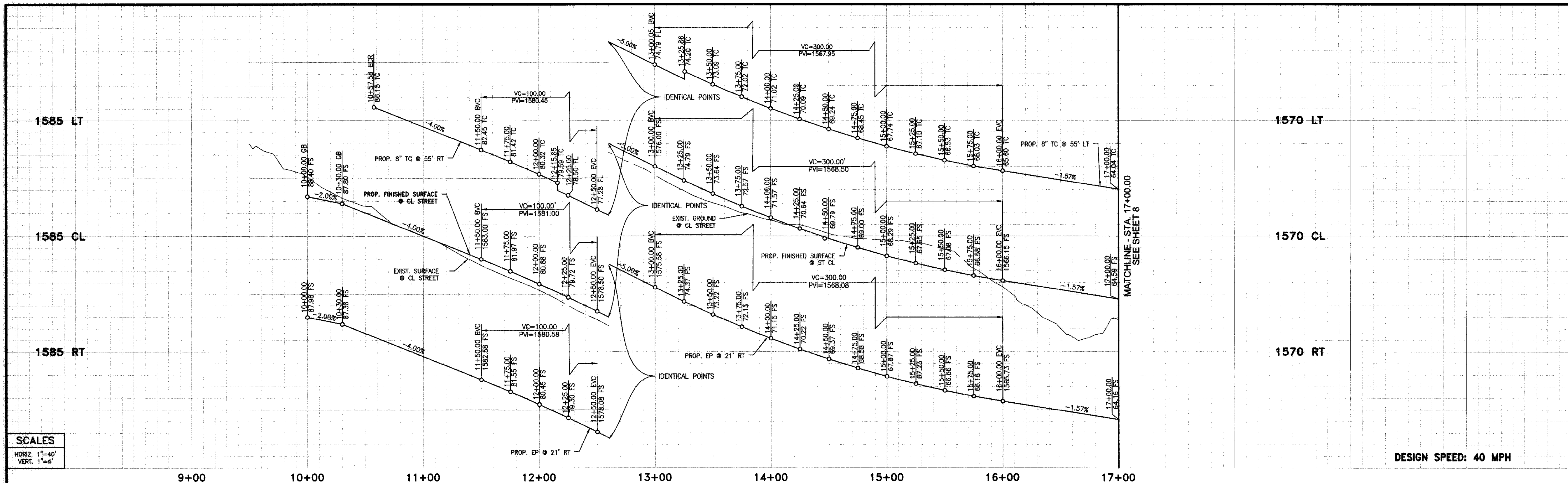
BENCHMARK:
SEE SHEET 1

SCALE:
H: AS SHOWN V: N/A

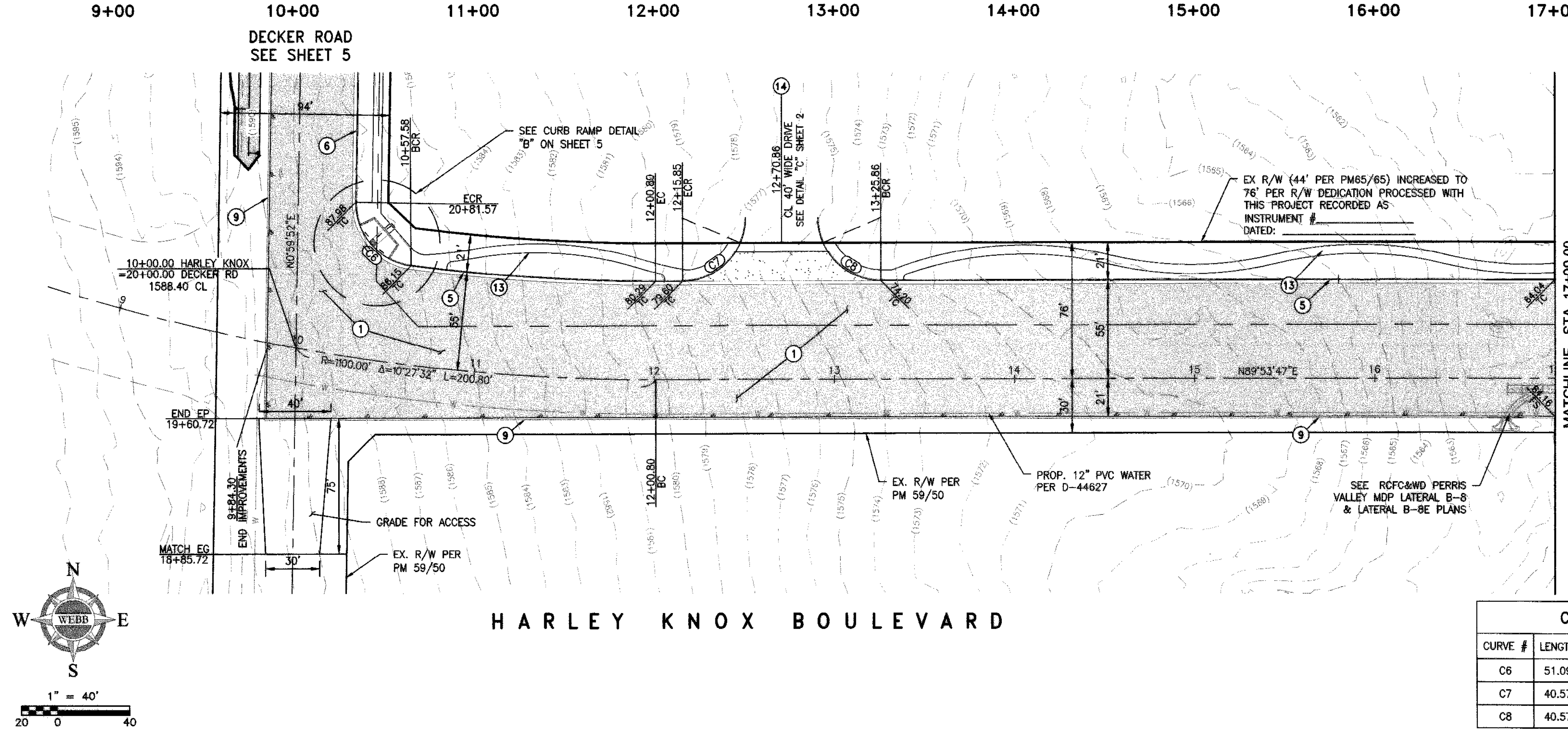
COUNTY OF RIVERSIDE
PLOT PLAN NO. 25954
NANDINA BUSINESS CENTER
STREET IMPROVEMENT PLAN
PLAN SHEET

FOR: TRAMMELL CROW COMPANY
W.O. 2015-0324
COUNTY FILE NO. 964B

SHEET NO. 6A OF 10 SHEETS



SCALES
HORIZ. 1"=40'
VERT. 1"=4'



CONSTRUCTION NOTES

1. CONSTRUCT MINIMUM 0.53' AC OVER 0.5' AB CLASS II
2. CONSTRUCT MINIMUM 0.43' AC OVER 0.50' AB CLASS II
3. CONSTRUCT 0.39' AC OVER 0.50 AB CLASS II
4. INTENTIONALLY LEFT BLANK
5. CONSTRUCT TYPE "A-8" CURB & GUTTER PER RIV. CO. STD. NO. 201
6. CONSTRUCT TYPE "A-6" CURB & GUTTER PER RIV. CO. STD. NO. 200
7. CONSTRUCT CONCRETE APRON AND TRANSITION PER DETAIL ON SHEET 10
8. CONSTRUCT CONCRETE PIPE INLET TYPE GCP PER CALTRANS STD D75B MODIFIED TO 48" RISER PER DETAIL ON SHEET 10
9. CONSTRUCT 1.0' CLASS II AB @ EP PER TYP. EDGE OF PAVEMENT DETAIL ON SHEET 2
10. SAWCUT & JOIN EX. AC PAVEMENT PER DETAIL ON SHEET 2
11. CONSTRUCT CURB RAMP CASE "A" OR "B" (MODIFIED) PER. RIV. CO. STD. NO. 403
12. CONSTRUCT 6' SIDEWALK AT CURB PER RIV. CO. STD. NO. 401
13. CONSTRUCT 5' MEANDERING SIDEWALK PER RIV. CO. STD. NO. 404
14. CONSTRUCT COMMERCIAL DRIVEWAY APPROACH PER RIV. CO. STD. 207A

AS-BUILT PLAN
CORRECTIONS NOTED
SIGNATURE: 4-5-18

BUILT PER PLAN

AS BUILT
THESE PLANS REFLECT ANY SUBSTANTIAL DESIGN MODIFICATIONS AS PROVIDED TO WEBB ASSOCIATES BY THE CONTRACTOR
SIGNATURE 3/22/18 DATE

REGISTERED PROFESSIONAL ENGINEER D. J. ARELLANO C 81988 CIVIL STATE OF CALIFORNIA

CURVE TABLE

CURVE #	LENGTH	RADIUS	DELTA	TANGENT
C6	51.09	35.00	83°38'30"	31.32
C7	40.57	35.00	66°25'19"	22.91
C8	40.57	35.00	66°25'19"	22.91

PP 25954 IP 160028

RECMD | COUNTY OVERSIGHT ENGINEER | REGISTRATION 45702 | DATE SIGNED 1-5-17
APPROVED AS TO COMPLIANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

DIGALERT — DIAL BEFORE YOU DIG — TWO WORKING DAYS BEFORE YOU DIG — TOLL FREE 1-800-227-2600 — A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

NOTE:
WORK CONTAINED WITHIN THESE PLANS SHALL NOT COMMENCE UNTIL AN ENCROACHMENT PERMIT AND/OR A GRADING PERMIT HAS BEEN ISSUED.

THE PRIVATE ENGINEER SIGNING THESE PLANS IS RESPONSIBLE FOR ASSURING THE ACCURACY AND ACCEPTABILITY OF THE DESIGN HEREON. IN THE EVENT OF DISCREPANCIES ARISING AFTER COUNTY APPROVAL OR DURING CONSTRUCTION, THE PRIVATE ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY THE COUNTY.

MARK	BY	DATE	REVISIONS	APPR.	DATE
ENGINEER				COUNTY	

SEAL - ENGINEER

ALBERT A. WEBB ASSOCIATES
ENGINEERING CONSULTANTS
3788 McCRAY STREET
RIVERSIDE CA. 92506
PH. (951) 686-1070

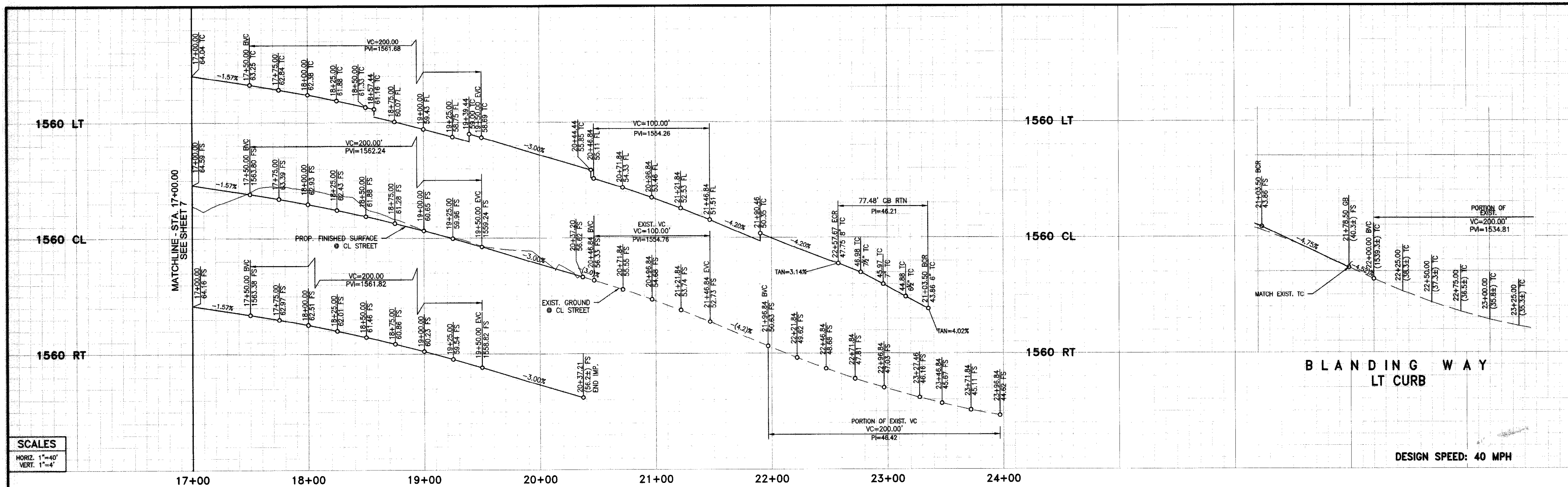
PREPARED UNDER THE SUPERVISION OF: D.J. ARELLANO
DESIGNED BY: CHECKED BY:
R.C.E. NO.: 81988
11/22/16 DATE

BENCHMARK: SEE SHEET 1
SCALE: H: AS SHOWN V: N/A

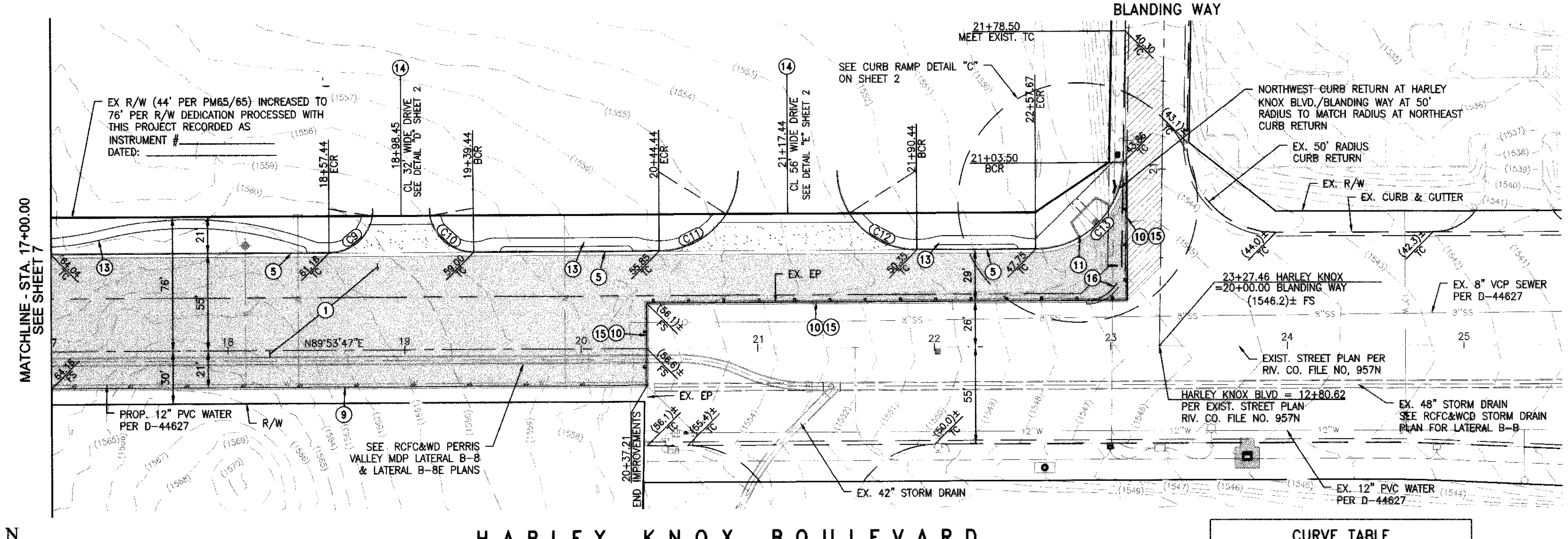
COUNTY OF RIVERSIDE
PLOT PLAN NO. 25954
NANDINA BUSINESS CENTER
STREET IMPROVEMENT PLAN
PLAN SHEET
FOR: TRAMMELL CROW COMPANY
W.O. 2015-0324
COUNTY FILE NO. 964B

SHEET NO. 7 OF 10 SHEETS

G:\2015\15-0324\DRAWINGS\DESIGN (00)\15-0324-C-ST.DWG 11/22/2016 4:32 PM



SCALES
HORIZ. 1"=40'
VERT. 1"=4'



1" = 40'

CONSTRUCTION NOTES

1. CONSTRUCT MINIMUM 0.53' AC OVER 0.5' AB CLASS II
2. CONSTRUCT MINIMUM 0.43' AC OVER 0.50' AB CLASS II
3. CONSTRUCT 0.39' AC OVER 0.50 AB CLASS II
4. INTENTIONALLY LEFT BLANK
5. CONSTRUCT TYPE "A-8" CURB & GUTTER PER RIV. CO. STD. NO. 201
6. CONSTRUCT TYPE "A-6" CURB & GUTTER PER RIV. CO. STD. NO. 200
7. CONSTRUCT CONCRETE APRON AND TRANSITION PER DETAIL ON SHEET 10
8. CONSTRUCT CONCRETE PIPE INLET TYPE GCP PER CALTRANS STD D75B MODIFIED TO 48" RISER PER DETAIL ON SHEET 10
9. CONSTRUCT 1.0' CLASS II AB @ EP PER TYP. EDGE OF PAVEMENT DETAIL ON SHEET 2
10. SAWCUT & JOIN EX. AC PAVEMENT PER DETAIL ON SHEET 2
11. CONSTRUCT CURB RAMP CASE "A" OR "B" (MODIFIED) PER. RIV. CO. STD. NO. 403
12. CONSTRUCT 6' SIDEWALK AT CURB PER RIV. CO. STD. NO. 401
13. CONSTRUCT 5' MEANDERING SIDEWALK PER RIV. CO. STD. NO. 404
14. CONSTRUCT COMMERCIAL DRIVEWAY APPROACH PER RIV. CO. STD. 207A
15. REMOVE EX. AC PAVEMENT
16. SAWCUT & REMOVE EX. CURB & GUTTER

BUILT PER PLAN

AS-BUILT PLAN
CORRECTIONS NOTED
SIGNATURE: 4-5-18

CURVE TABLE

CURVE #	LENGTH	RADIUS	DELTA	TANGENT
C9	35.25	25.00	80°47'35"	21.27
C10	35.25	25.00	80°47'35"	21.27
C11	45.37	45.00	57°46'09"	24.83
C12	45.37	45.00	57°46'09"	24.83
C13	77.48	50.00	88°47'25"	48.95

AS BUILT
THESE PLANS REFLECT ANY SUBSTANTIAL DESIGN MODIFICATIONS AS PROVIDED TO WEBB ASSOCIATES BY THE CONTRACTOR
SIGNATURE 3/22/19 DATE
REGISTERED PROFESSIONAL ENGINEER D. J. ARELLANO C 81988 CIVIL STATE OF CALIFORNIA

PP 25954 IP 160028

RECMD	COUNTY OVERSIGHT ENGINEER	REGISTRATION	DATE SIGNED
X	Alan French	45702	1-5-17

APPROVED AS TO COMPLIANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

DIGALERT
DIAL BEFORE YOU DIG — TWO WORKING DAYS BEFORE YOU DIG
TOLL FREE 1-800-227-2600
A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

NOTE:
WORK CONTAINED WITHIN THESE PLANS SHALL NOT COMMENCE UNTIL AN ENCROACHMENT PERMIT AND/OR A GRADING PERMIT HAS BEEN ISSUED.

THE PRIVATE ENGINEER SIGNING THESE PLANS IS RESPONSIBLE FOR ASSURING THE ACCURACY AND ACCEPTABILITY OF THE DESIGN HEREON. IN THE EVENT OF DISCREPANCIES ARISING AFTER COUNTY APPROVAL OR DURING CONSTRUCTION, THE PRIVATE ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY THE COUNTY.

MARK	BY	DATE	REVISIONS	APPR.	DATE
ENGINEER				COUNTY	

SEAL - ENGINEER
REGISTERED PROFESSIONAL ENGINEER D.J. ARELLANO NO. 81988 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
ENGINEERING CONSULTANTS
3788 McCRAY STREET
RIVERSIDE CA. 92506
PH. (951) 686-1070

PREPARED UNDER THE SUPERVISION OF:
D.J. ARELLANO
DESIGNED BY: ____ CHECKED BY: ____
R.C.E. NO.: 81988
11/22/16
DATE

BENCHMARK:
SEE SHEET 1

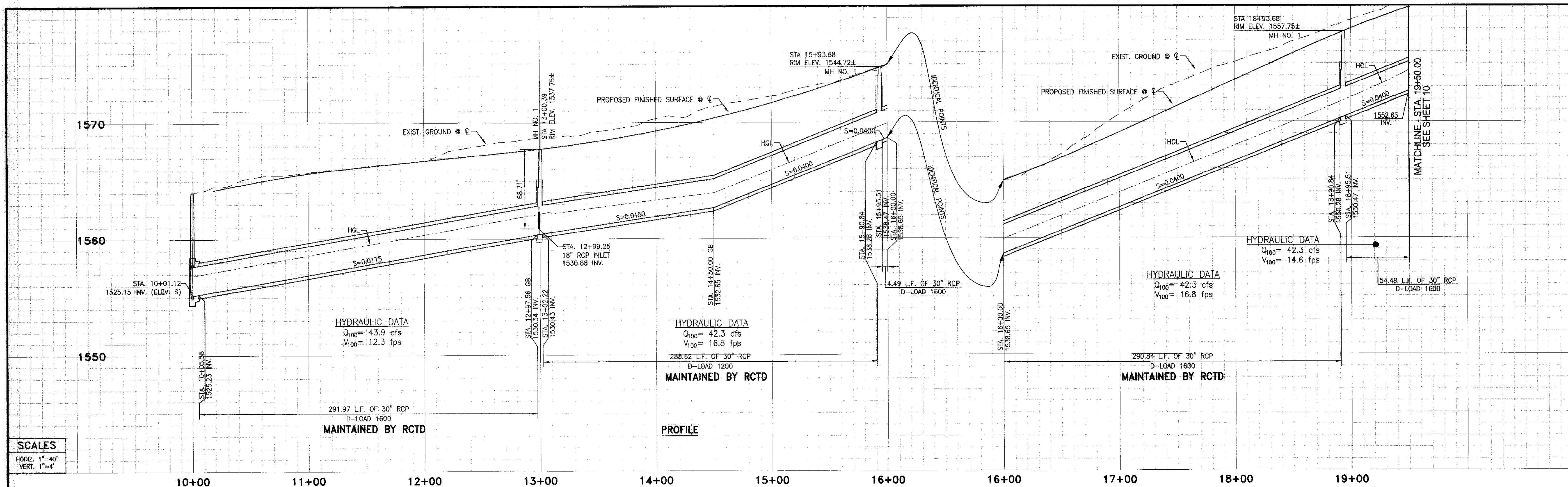
SCALE:
H: AS SHOWN V: N/A

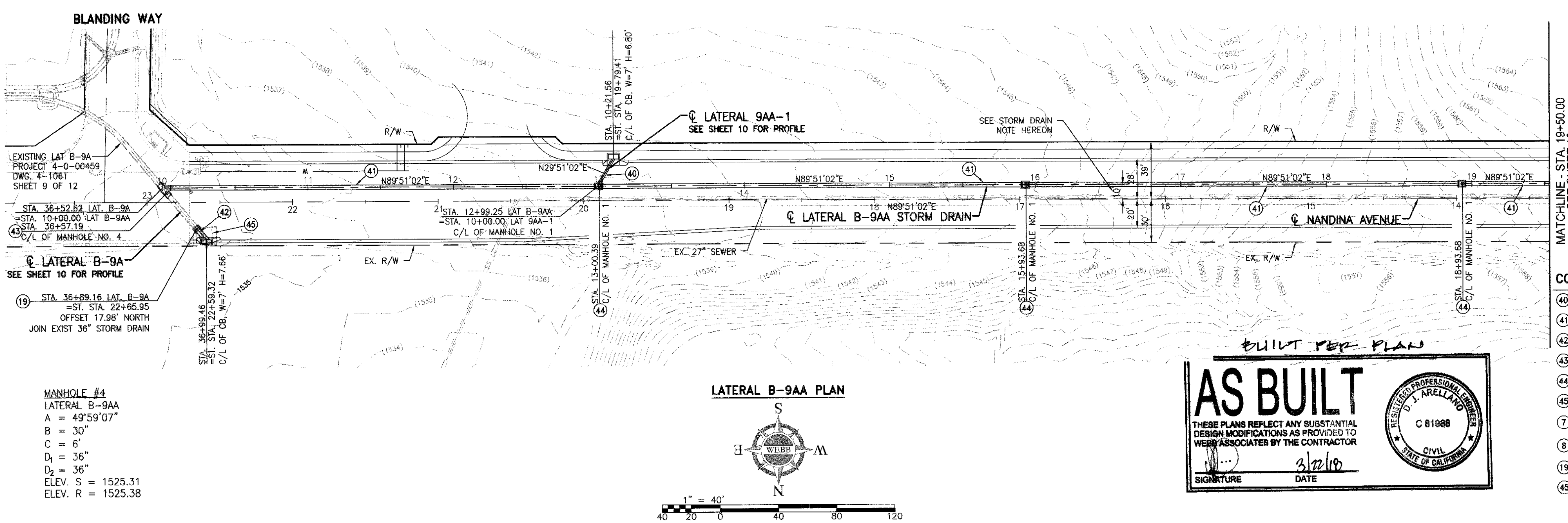
COUNTY OF RIVERSIDE
PLOT PLAN NO. 25954
NANDINA BUSINESS CENTER
STREET IMPROVEMENT PLAN
PLAN SHEET

FOR: TRAMMELL CROW COMPANY
W.O. 2015-0324
COUNTY FILE NO. 9644 B

SHEET NO. 8
OF 10 SHEETS

G:\2015\15-0324\DRAWINGS\DESIGN (00)\15-0324-C-ST.DWG





STORM DRAIN NOTE:

PROPOSED STORM DRAIN ALIGNMENT SET AT 10' SOUTH OF STREET CENTERLINE TO PROVIDE MAINTENANCE ACCESS TO EXISTING 27" SEWER MAIN, LOCATED 1.5' SOUTH OF STREET CENTERLINE.

AS-BUILT PLAN
CORRECTIONS NOTED
SIGNATURE: [signature] 1-5-18

CONSTRUCTION NOTES

- (40) INSTALL 18" RCP STORM DRAIN (D-LOAD PER PLAN)
- (41) INSTALL 30" RCP STORM DRAIN (D-LOAD PER PLAN)
- (42) INSTALL 36" RCP STORM DRAIN (D-LOAD PER PLAN)
- (43) CONSTRUCT MANHOLE NO. 4 PER RCFC&WCD STD. NO. MH254
- (44) CONSTRUCT MANHOLE NO. 1 PER RCFC&WCD STD. NO. MH251
- (45) CONSTRUCT JUNCTION NO. 2 PER RCFC&WCD STD. NO. JS227
- (7) CONSTRUCT CONCRETE APRON AND TRANSITION PER DETAIL HEREON
- (8) CONSTRUCT CONCRETE PIPE INLET TYPE GCP PER CALTRANS STD D75B MODIFIED TO 48" DIAMETER
- (19) CONSTRUCT CONCRETE COLLAR PER RCFC&WCD STD. NO. M803
- (45) DEMOLISH EXISITNG CATCH BASIN

BUILT PER PLAN

AS BUILT
THESE PLANS REFLECT ANY SUBSTANTIAL DESIGN MODIFICATIONS AS PROVIDED TO WEBB ASSOCIATES BY THE CONTRACTOR
SIGNATURE [signature] DATE 3/22/18

REGISTERED PROFESSIONAL ENGINEER D. J. ARELLANO C 81988 CIVIL STATE OF CALIFORNIA

PP 25954 IP 160028

RECMD | COUNTY OVERSIGHT ENGINEER | REGISTRATION | DATE SIGNED
[initials] | [signature] | 45702 | 1-5-17

APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

DIGALERT
DIAL BEFORE YOU DIG — TWO WORKING DAYS BEFORE YOU DIG
TOLL FREE 1-800-227-2600
A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

NOTE:
WORK CONTAINED WITHIN THESE PLANS SHALL NOT COMMENCE UNTIL AN ENCROACHMENT PERMIT AND/OR A GRADING PERMIT HAS BEEN ISSUED.

THE PRIVATE ENGINEER SIGNING THESE PLANS IS RESPONSIBLE FOR ASSURING THE ACCURACY AND ACCEPTABILITY OF THE DESIGN HEREON. IN THE EVENT OF DISCREPANCIES ARISING AFTER COUNTY APPROVAL OR DURING CONSTRUCTION, THE PRIVATE ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY THE COUNTY.

MARK	BY	DATE	REVISIONS	APPR.	DATE
ENGINEER				COUNTY	

SEAL - ENGINEER
REGISTERED PROFESSIONAL ENGINEER D. J. ARELLANO NO. 81988 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
ENGINEERING CONSULTANTS
3788 McCRAY STREET
RIVERSIDE CA. 92506
PH. (951) 686-1070

PREPARED UNDER THE SUPERVISION OF:
D.J. ARELLANO
DESIGNED BY: MS CHECKED BY: SA
R.C.E. NO.: 81988
DATE 11/1/16

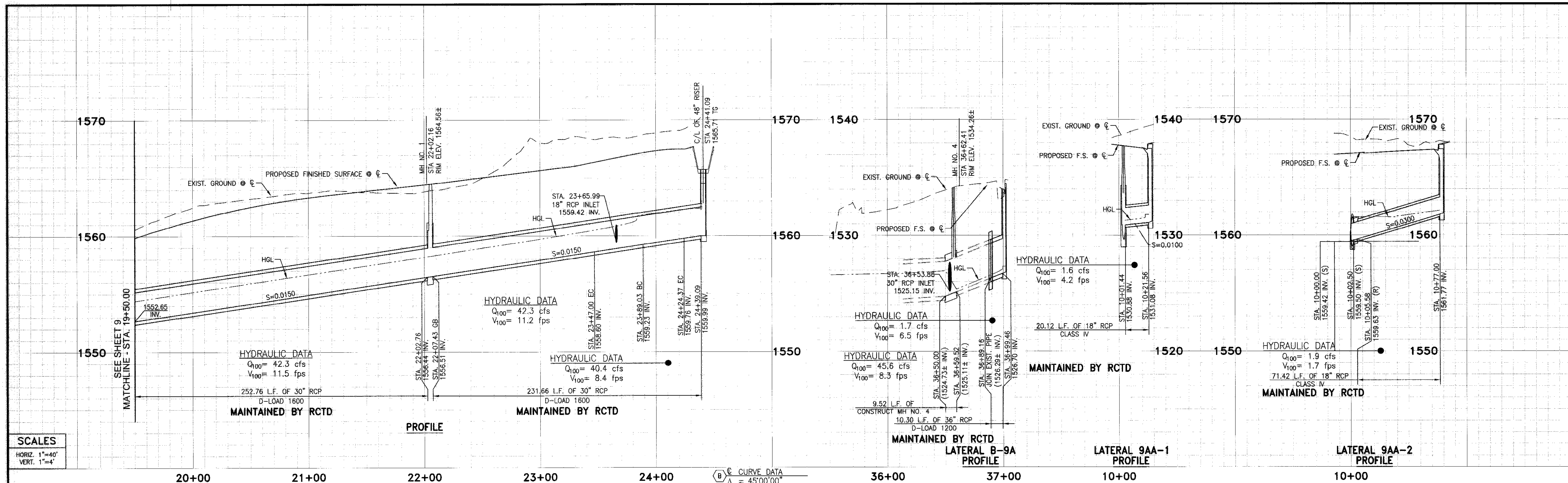
BENCHMARK:
SEE SHEET 1
SCALE:
H: AS SHOWN V: N/A

COUNTY OF RIVERSIDE
PLOT PLAN NO. 25954
NANDINA BUSINESS CENTER
STREET IMPROVEMENT PLAN
PLAN SHEET

FOR: TRAMMELL CROW COMPANY | W.O. 2015-0324 | COUNTY FILE NO. 964B

SHEET NO. 9 OF 10 SHEETS

G:\2015\15-0324\DRAWINGS\DESIGN (00)\15-0324-C-OFFSITE-SD.DWG 10/28/2016 11:15 AM



PROFILE

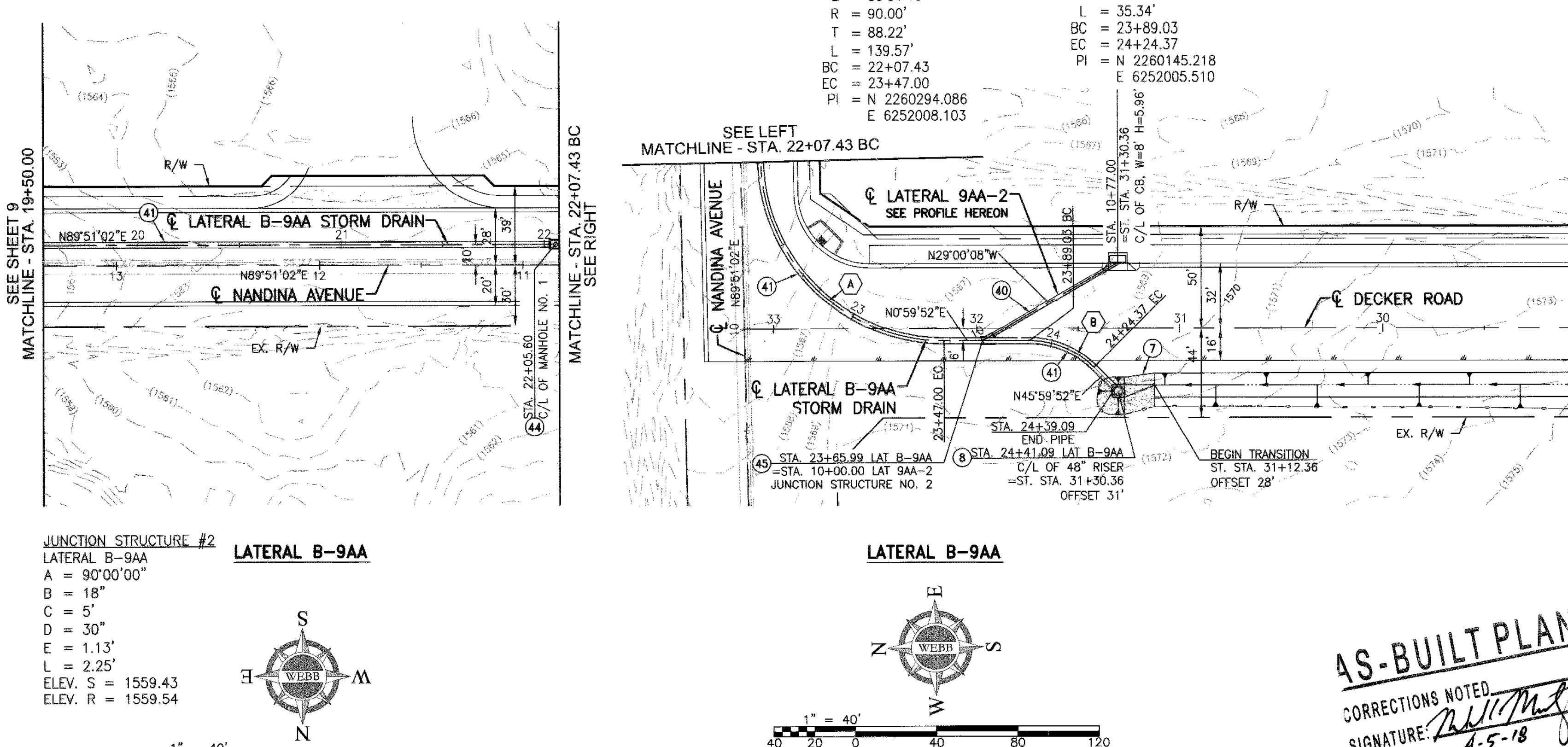
LATERAL B-9A PROFILE

LATERAL 9AA-1 PROFILE

LATERAL 9AA-2 PROFILE

SCALES

HORIZ. 1"=40'
VERT. 1"=4'



(A) ℄ CURVE DATA
Δ = 88°51'10"
R = 90.00'
T = 88.22'
L = 139.57'
BC = 22+07.43
EC = 23+47.00
PI = N 2260294.086
E 6252008.103

(B) ℄ CURVE DATA
Δ = 45°00'00"
R = 45.00'
T = 18.64'
L = 35.34'
BC = 23+89.03
EC = 24+24.37
PI = N 2260145.218
E 6252005.510

JUNCTION STRUCTURE #2
LATERAL B-9AA
A = 90°00'00"
B = 18"
C = 5'
D = 30"
E = 1.13'
L = 2.25'
ELEV. S = 1559.43
ELEV. R = 1559.54

LATERAL B-9AA

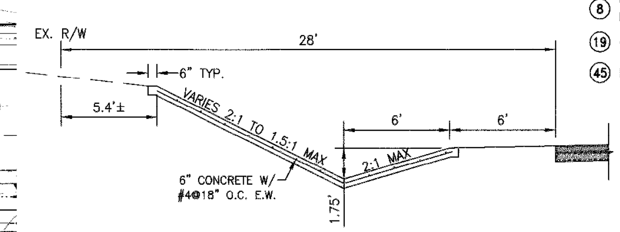
LATERAL B-9AA

1" = 40'

AS-BUILT PLAN
CORRECTIONS NOTED
SIGNATURE: 4-5-18

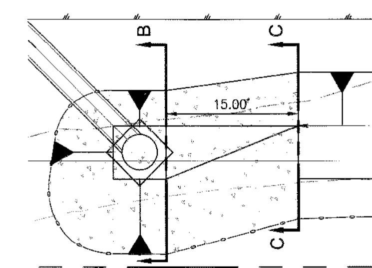
CONSTRUCTION NOTES

(40) INSTALL 18" RCP STORM DRAIN (D-LOAD PER PLAN)
(41) INSTALL 30" RCP STORM DRAIN (D-LOAD PER PLAN)
(42) INSTALL 36" RCP STORM DRAIN (D-LOAD PER PLAN)
(43) CONSTRUCT MANHOLE NO. 4 PER RCFC&WCD STD. NO. MH254
(44) CONSTRUCT MANHOLE NO. 1 PER RCFC&WCD STD. NO. MH251
(45) CONSTRUCT JUNCTION NO. 2 PER RCFC&WCD STD. NO. JS227
(7) CONSTRUCT CONCRETE APRON AND TRANSITION PER DETAIL HEREON
(8) CONSTRUCT CONCRETE PIPE INLET TYPE GCP PER CALTRANS STD D75B MODIFIED TO 48" DIAMETER
(19) CONSTRUCT CONCRETE COLLAR PER RCFC&WCD STD. NO. M803
(45) DEMOLISH EXISITNG CATCH BASIN BUILT PER PLAN

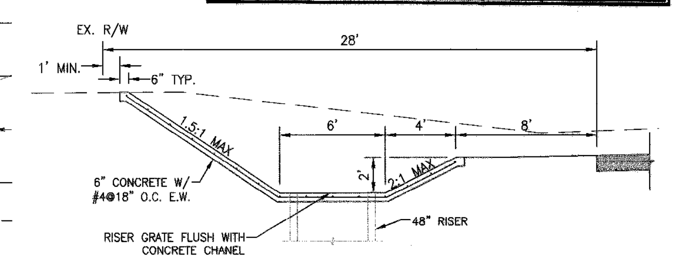


SECTION C-C
NOT TO SCALE

AS BUILT
THESE PLANS REFLECT ANY SUBSTANTIAL DESIGN MODIFICATIONS AS PROVIDED TO WEBB ASSOCIATES BY THE CONTRACTOR
SIGNATURE 3/22/18 DATE
REGISTERED PROFESSIONAL ENGINEER D. J. ARELLANO C 81988 CIVIL STATE OF CALIFORNIA



(7) CONCRETE INLET TRANSITION
NOT TO SCALE



SECTION B-B
NOT TO SCALE

PP 25954 IP 160028

RECMD	COUNTY OVERSIGHT ENGINEER	REGISTRATION	DATE SIGNED
SC	Alan French	45702	1-5-17

APPROVED AS TO CONFORMANCE WITH APPLICABLE COUNTY STANDARDS AND PRACTICES.

DIGALERT — DIAL BEFORE YOU DIG — TWO WORKING DAYS BEFORE YOU DIG — TOLL FREE 1-800-227-2600 — A PUBLIC SERVICE BY UNDERGROUND SERVICE ALERT

NOTE:
WORK CONTAINED WITHIN THESE PLANS SHALL NOT COMMENCE UNTIL AN ENCROACHMENT PERMIT AND/OR A GRADING PERMIT HAS BEEN ISSUED.

THE PRIVATE ENGINEER SIGNING THESE PLANS IS RESPONSIBLE FOR ASSURING THE ACCURACY AND ACCEPTABILITY OF THE DESIGN HEREON. IN THE EVENT OF DISCREPANCIES ARISING AFTER COUNTY APPROVAL OR DURING CONSTRUCTION, THE PRIVATE ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY THE COUNTY.

MARK	BY	DATE	REVISIONS	APPR.	DATE
	ENGINEER			COUNTY	

SEAL - ENGINEER
REGISTERED PROFESSIONAL ENGINEER D. J. ARELLANO NO. 81988 CIVIL STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
ENGINEERING CONSULTANTS
3788 McCRAY STREET
RIVERSIDE CA. 92506
PH. (951) 686-1070

PREPARED UNDER THE SUPERVISION OF:
D.J. ARELLANO
DESIGNED BY: MS CHECKED BY: SA
R.C.E. NO.: 81988
11/1/16 DATE

BENCHMARK:
SEE SHEET 1

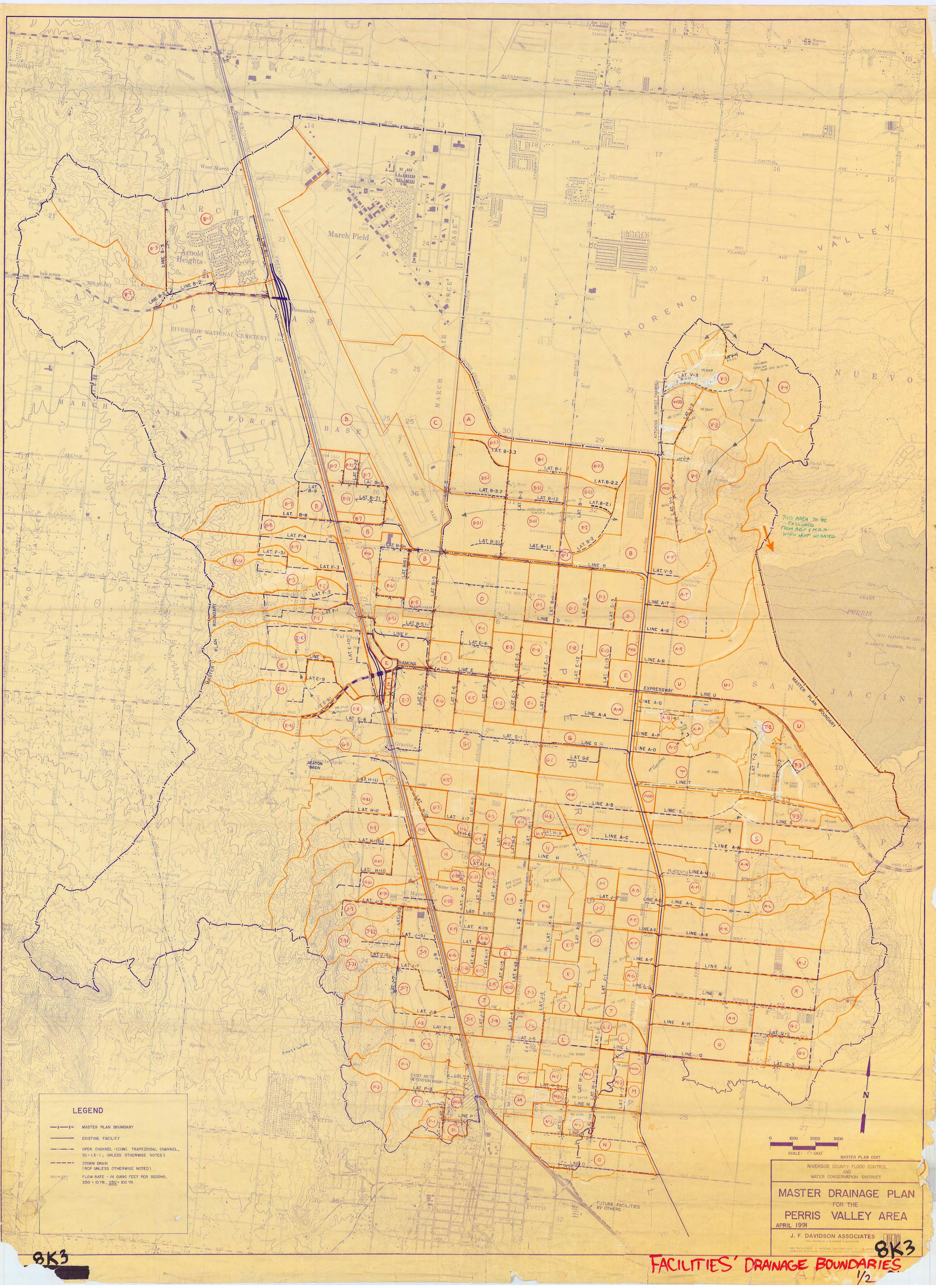
SCALE:
H: AS SHOWN V: N/A

COUNTY OF RIVERSIDE
PLOT PLAN NO. 25954
NANDINA BUSINESS CENTER
STREET IMPROVEMENT PLAN
PLAN SHEET

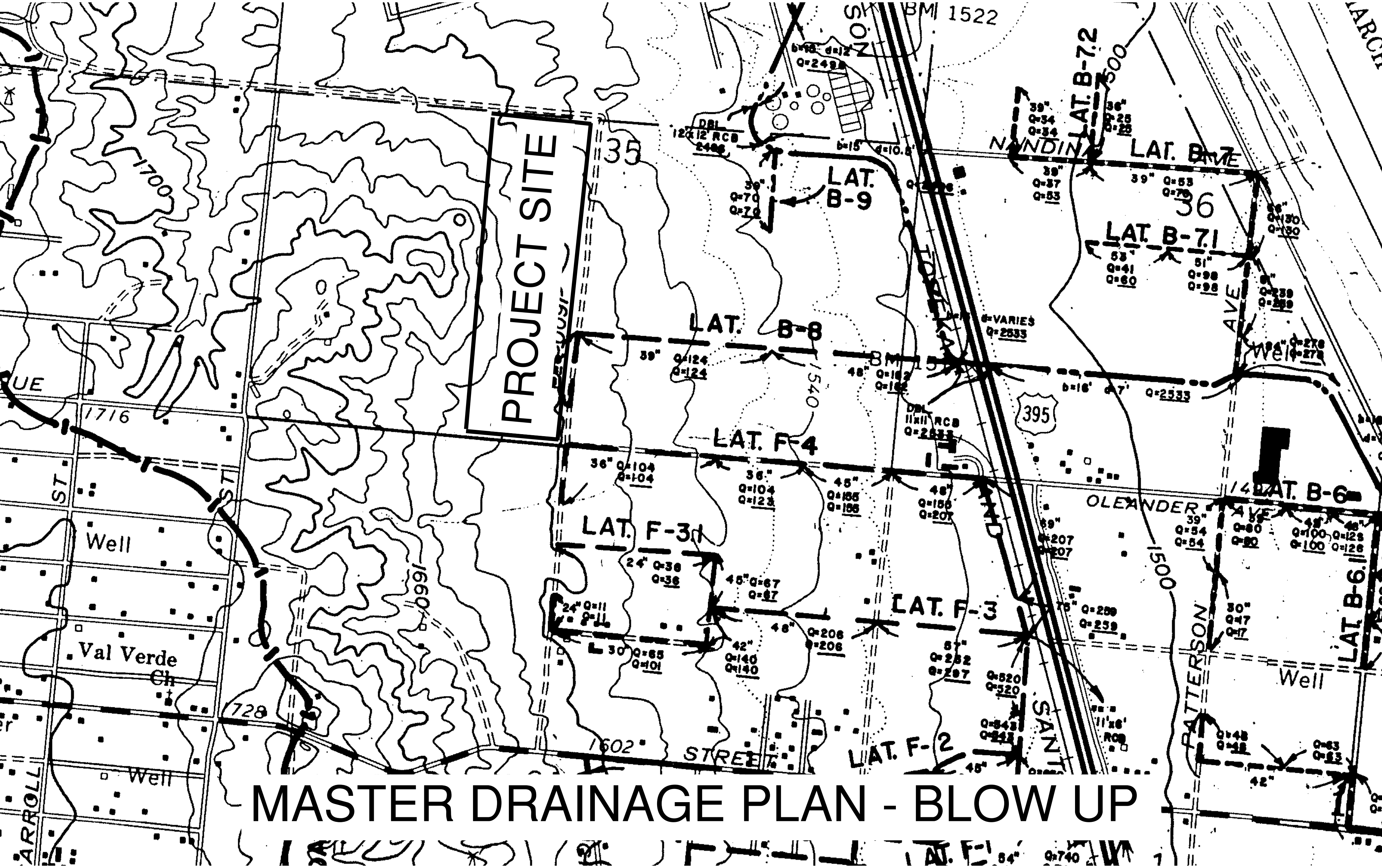
FOR: TRAMMELL CROW COMPANY
W.O. 2015-0324

SHEET NO. 10 OF 10 SHEETS
COUNTY FILE NO. 964B

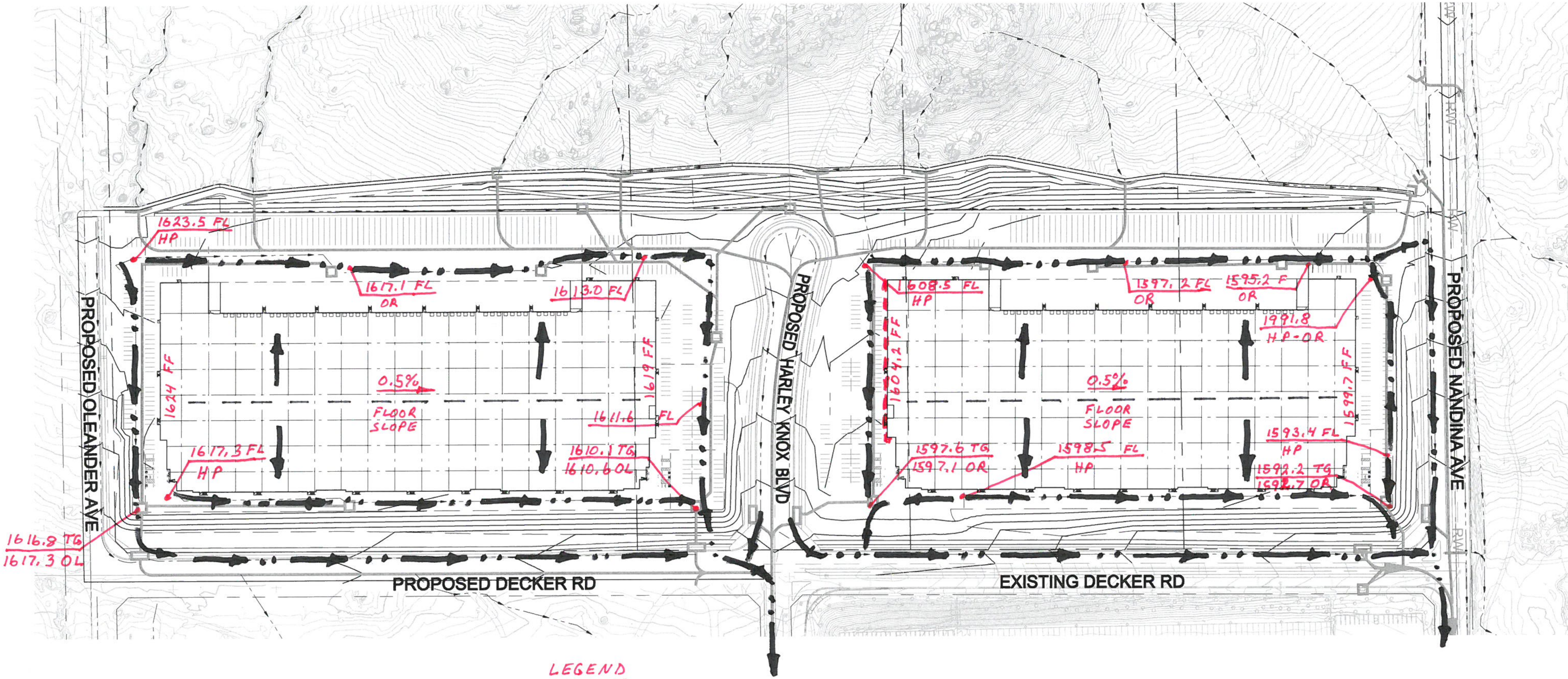
G:\2015\15-0324\DRAWINGS\DESIGN (00)\15-0324-C-OFFSITE-SD.DWG 10/31/2016 9:05 AM


MASTER DRAINAGE PLAN
FOR THE
PERRIS VALLEY AREA
APRIL 1991
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
MASTER PLAN COST
SCALE: 1" = 1000'
0 1000 2000 3000
J. F. DAVIDSON ASSOCIATES
LEGEND
MASTER PLAN BOUNDARY
EXISTING FACILITY
OPEN CHANNEL (CONC. TRAPEZOIDAL CHANNEL, SS = 1.5:1, UNLESS OTHERWISE NOTED)
STORM DRAIN (RCP UNLESS OTHERWISE NOTED)
FLOW RATE - IN CUBIC FEET PER SECOND, 250 = 10 YR, 250 = 100 YR.
FUTURE FACILITIES BY OTHERS
MASTER PLAN BOUNDARY
March Field
Arnold Heights
RIVERSIDE NATIONAL CEMETERY
MORENO VALLEY
SAN JACINTO
LINE A-A
LINE A-B
LINE A-C
EXPRESSWAY
LINE U
LINE S
THIS AREA TO BE EXCLUDED FROM ADP / M.D.P. WHEN NEXT UPDATED
FACILITIES' DRAINAGE BOUNDARIES
1/2
8K3
8K3


LEGEND
MASTER PLAN BOUNDARY
EXISTING FACILITY
OPEN CHANNEL -(CONC. TRAPEZOIDAL CHANNEL, SS = 1.5 : 1 ; UNLESS OTHERWISE NOTED)
STORM DRAIN (RCP UNLESS OTHERWISE NOTED)
250 or 250
FLOW RATE - IN CUBIC FEET PER SECOND, 250 = DESIGN Q, 250 = 100 YR. Q
N
1" = 1200'
MASTER PLAN COST $ 142,832,000
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
MASTER DRAINAGE PLAN
FOR THE
PERRIS VALLEY AREA
JULY 1987 (REVISED JUNE 1991)
J. F. DAVIDSON ASSOCIATES
CIVIL ENGINEERS • PLANNERS • SURVEYORS
MARCH AIR FORCE BASE
March Field
Arnold Heights
RIVERSIDE NATIONAL CEMETERY
MORENO VALLEY
PERRIS RESERVOIR
SAN JACINTO
PERRIS VALLEY
Perris
MASTER PLAN BOUNDARY
FUTURE FACILITIES BY OTHERS



MASTER DRAINAGE PLAN - BLOW UP



LEGEND

OR = OVERLAND RELIEF
FL = FLOW LINE
HP = HIGH POINT
TG = TOP OF GRATE INLET
= STEMWALL ABOVE FS PROTECTING BUILDING

LEGEND

PROPOSED STORM DRAIN SYSTEM

DIRECTION OF OVERLAND RELIEF

EXISTING AND PROPOSED SWALES

200 100 0 200 400 600

SCALE: 1"=200'

THE ASSUPTION IS THAT EVERY INLET IS TOTALLY CLOGGED AND THE 100-YEAR STORM EVENT MUST FLOW OFF-SITE WITHOUT DAMAGE TO INFRASTRUCTURE.

Prepared By:

Michael Baker INTERNATIONAL

5 Hutton Centre Drive, Suite 500
Santa Ana CA 92707
Phone: (949) 472-3505
MBAKERINTL.COM

MEAD VALLEY BUSINESS PARK
OVERLAND RELIEF MAP
PROPOSED CONDITION
RIVERSIDE COUNTY, CA
JULY 2019

JN:	1" = 200'	DATE:	7/5/2019

H:\PDATA\152480\CADD\LAND\DLV\HYDRO\PRELIMINARY\MAPS\152480-PRELIM-OVERLAND-RELIEF-MAP.DWG RHOWE 7/5/19 3:52 pm


OFF-SITE RUNOFF FROM EXISTING SUBAREAS T AND U ARE CURRENTLY DIVERTED NORTH OF NANDINA THROUGH AN 18" CULVERT INSTALLED CIRCA 2017. THE RUNOFF FLOWS 1300' EASTERLY TO LATERAL B-9A. IN THE PROPOSED CONDITION THE CULVERT WILL BE REMOVED AND OFF-SITE RUNOFF FROM THESE SUBAREAS WILL BE INTERCEPTED, CONVEYED, AND COMBINED WITH ON-SITE RUNOFF (AFTER FILTRATION FOR WQMP PURPOSES) TO LATERAL B-9AA HERE. TO PROPERLY COMPARE EXISTING RUNOFF RATES AND VOLUMES TO PROPOSED RUNOFF RATES AND VOLUMES IT IS ASSUMED THAT ALL RUNOFF COMBINES AT LATERAL B-9AA HERE. RUNOFF VALUES SHOWN IGNORE THE 18" CULVERT AND ASSUME ALL RUNOFF COMBINES AS A SINGLE 34.7 AC WATERSHED.
THE PEAK RUNOFF RATE TO LATERAL B-9AA PER ASBUILT DWG NO. 964B WAS Q100=42.3 CFS. PER THIS STUDY Q100=55.25 CFS WHICH IS THE SUMMATION OF (Q100=53.35 CFS) PLUS N.A.P. LATERAL B-9AA-2 (Q100=1.90 CFS).
EXISTING LATERAL B-9A
36" RCP SD
PER DWG NO. 4-1061
Q100=71.5 CFS IS N.A.P.
EX 18" CULVERT IGNORED, RUNOFF ASSUMED TO JOIN AT LATERAL 9AA.
EXISTING NANDINA AVE
LATERAL B-9AA
FUTURE NANDINA AVE
EX 30" SD
LATERAL B-9AA
LATERAL B-9AA-2 (N.A.P.)
Q100-SUBAREA=1.90 CFS
18" RCP SD PER RIVERSIDE COUNTY FILE NO. 964B
WATERSHED B-9AA RUNOFF VOLUME AND PEAK RATES. HISTORICALLY RUNOFF FROM WATERSHED B-9AA FLOWED EASTERLY AND PER MASTER DRAINAGE PLAN FOR PERRIS VALLEY AREA JUNE 1991 WAS INTENDED TO BE TRIBUTARY TO STORM DRAIN LATERAL B-9. HERE EXISTING UPON CONSTRUCTION OF STORM DRAIN LATERAL B-9AA PER RIVERSIDE COUNTY FILE NO. 964B RUNOFF IS PICKED UP IN A DECKER RD ADJACENT 48" RISER TRIBUTARY TO STORM DRAIN LATERAL B-9AA AND ULTIMATELY LATERAL B-9.
34.7 ACRE WATERSHED B-9AA:
TOTAL RUNOFF VOLUME 10 YR/24 HR STORM=4.03 AC-FT AND RUNOFF RATES Q10=33.67 CFS, Q100=53.35 CFS
EXISTING BLANDING WAY
SUMMATION OF EXISTING CONDITION 105.7 ACRE HYDROLOGIC BOUNDARY:
TOTAL RUNOFF VOLUME 10 YR/24 HR STORM=12.28 AC-FT AND RUNOFF RATES Q10=97.33 CFS, Q100=152.08 CFS
RUNOFF FROM HERE AND WEST OF HERE FLOWS NORTHERLY ACROSS FUTURE NANDINA OFF-SITE BEYOND OUR HYDROLOGIC BOUNDARY
B-9AA
34.7 AC
EXISTING DECKER RD
EXISTING INDUSTRIAL WAREHOUSE FACILITY
WATERSHED B-8 RUNOFF VOLUME AND PEAK RATES. HISTORICALLY RUNOFF FROM WATERSHED B-8 FLOWED EASTERLY AND PER MASTER DRAINAGE PLAN FOR PERRIS VALLEY AREA JUNE 1991 WAS INTENDED TO BE TRIBUTARY TO STORM DRAIN LATERAL B-8. HERE EXISTING UPON CONSTRUCTION OF HARLEY KNOX BLVD TO DECKER RD AND EXTENSION OF STORM DRAIN LATERAL B-8 PER RIVERSIDE COUNTY FLOOD CONTROL DISTRICT DRAWING NO. 4-1060 RUNOFF IS PICKED UP AND IS ULTIMATELY TRIBUTARY TO STORM DRAIN LATERAL B-8.
FROM THE 71.0 ACRE WATERSHED B-8:
TOTAL RUNOFF VOLUME 10 YR/24 HR STORM=8.25 AC-FT AND RUNOFF RATES Q10=63.66 CFS, Q100=98.73 CFS
THE PEAK RUNOFF RATE TO LATERAL B-8 PER RIVERSIDE COUNTY FLOOD CONTROL DISTRICT ASBUILT DRAWING NO. 4-1060DWG NO. 964B WAS APPROVED FOR Q100=182.00 CFS. PER THIS STUDY Q10=90.85 CFS, Q100=140.90 CFS (THE SUMMATION OF WATERSHED B-8 PLUS WATERHSED B-8A).
FUTURE DAY ST
FUTURE HARLEY KNOX BLVD
EXISTING HARLEY KNOX BLVD
EX 48" SD
LATERAL B-8
EX 48" SD
LATERAL B-8
FROM B-8A ONLY
Q10-TOTAL=27.19 CFS
Q100-TOTAL=42.17 CFS
31.9 ACTOTAL
HISTORICALLY RUNOFF FROM WATERSHED B-8A FLOWED EASTERLY AND PER MASTER DRAINAGE PLAN FOR PERRIS VALLEY AREA JUNE 1991 WAS INTENDED TO BE TRIBUTARY TO STORM DRAIN LATERAL B-8. HERE EXISTING UPON CONSTRUCTION OF STORM DRAIN LATERAL B-8A PER RIVERSIDE COUNTY FLOOD CONTROL DISTRICT DRAWING NO. 4-1060 RUNOFF IS.
FUTURE DECKER RD
B-8
71.0 AC
B-8A
31.9 AC
NOTE:
TO PREPARE A HYDROLOGY REPORT AND COMPARE THE EXISTING CONDITION TO THE PROPOSED CONDITION RUNOFF FROM WEST OF DECKER RD AND TRIBUTARY TO THE SITE (WATERSHED B-8) IS ANALYZED SEPARATELY FROM RUNOFF EAST OF DECKER RD AND NOT TRIBUTARY TO THE SITE (WATERSHED B-8A).
EX 48" SD
LATERAL B-8A
EXISTING INDUSTRIAL WAREHOUSE FACILITY
EXISTING DAY ST
FUTURE INDUSTRIAL WAREHOUSE FACILITY
FUTURE OLEANDER AVE
FUTURE OLEANDER AVE
LEGEND
WATERSHED BOUNDARY
WATERSHED NO.
SUB-AREA BOUNDARY
EX SD SYSTEM
SUB-AREA NO. SUB-AREA-ACREAGE
NODE NO.
INITIAL AREA FLOW-LINE
L=270' LENGTH OF FLOW-LINE OR PIPE
S=0.8% SLOPE OF STREET OR PIPE
SCALE: 1"=120'
PREPARED BY:
Michael Baker INTERNATIONAL
5 Hutton Centre Drive, Suite 500
Santa Ana, CA 926707
Phone: (949) 472-3505
MBAKERINTL.COM
MEAD VALLEY BUSINESS PARK
PRELIMINARY HYDROLOGY MAP
EXISTING CONDITION
RIVERSIDE COUNTY, CA
JULY 2019
SCALE: 1" = 120'
PROJECT NO. 152480
DATE: 7/8/2019

PREPARED BY:

Michael Baker INTERNATIONAL
5 Hutton Centre Drive, Suite 500
Santa Ana, CA 926707
Phone: (949) 472-3505
MBAKERINTL.COM

MEAD VALLEY BUSINESS PARK
PRELIMINARY HYDROLOGY MAP
PROPOSED CONDITION
RIVERSIDE COUNTY, CA
JULY 2019

SCALE: 1" = 120'
PROJECT NO. 152480
DATE: 7/8/2019