APPENDIX E

HYDROLOGY & WATER QUALITY

APPENDIX E.1

WEBB-A

Preliminary Drainage Analysis (Proposed)

Ethanac Logistics Center
DPR22-00030
Perris, California

Preliminary Drainage Study

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Original Date Prepared: January 2023
Revision Date(s): April 2023, September 2023, December 2023, January 2024

DRAFT

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Illinois Avenue Line A Storm Drain Plan P8-921
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Development Plan Review 22-00030

SECTION 1 - SUMMARY

PURPOSE

The purpose of this report is to document the hydrologic and hydraulic analyses performed in support of the Ethanac Logistics Center project located in City of Perris, County of Riverside, California. The project site is located north of Ethanac Road, bounded by Sherman Road to east, Trumble Road to the west, vacant land and an industrial development to the north. The project applicant proposes to build a commercial/industrial building on approximately 21 gross acres. This report will summarize the hydrologic and hydraulic analyses that were conducted in order to determine the necessary drainage improvements required to provide flood protection for the proposed building and safely convey the runoff through the site.

The scope of this report will include the following:

- Determine the peak 100-year and 10-year flow rates for the developed condition using the Riverside County Flood Control and Water Conservation District (RCFC&WCD) Rational Method.
- Determine the required storm drain facilities, alignment, and sizes required to flood protect the project site.
- Determine the volume required for water quality treatment and to mitigate for increases in runoff.
- Preparation of a preliminary report summarizing the hydrology and hydraulic results.

DESCRIPTION OF WATERSHED

As previously described, the project applicant is proposing a commercial/industrial building (approximately 400,000 square feet) on approximately 21 gross acres of vacant land. Existing elevations across the site vary from 1433 in the southeast corner of the site to 1427.7 in the west end (NAVD88 datum). The site currently slopes down at approximately 1% grade to the west. The existing drainage pattern for the site and the general area is characterized by sheet flows that follow the slope to the west towards Trumble Road. The project site is not located within a specific plan, but it is within the Romoland Master Drainage Plan watershed area.

PROPOSED CONDITIONS

ONSITE

In the proposed condition of Ethanac Logistics Center (Project) onsite runoff will be conveyed throughout the site via proposed ribbon gutters and curbs and gutters. Onsite runoff will then be captured by a network of drainage inlets provided at low points. Proposed private underground storm drain Lines 1 and 2 convey captured flows towards underground storage chambers before being pumped to a proposed biotreatment device for water quality treatment. Treated stormwater will then gravity flow to proposed storm drain Line 4 in Trumble Road, that connects to the existing City Line A in Illinois Avenue. City Line A then connects to MDP Line A-11 via 6'x5' RCB under the I-215 per the "Perris Crossing Temporary Earth Channel, Romoland MDP Line A11 and Laterals" P-397 plans, referenced in Appendix D. This RCB yields a flow capacity of approximately 404 CFS to MDP Line A-11. The total confluence flows through City Line A in Illinois, including Ethanac Logistics Center flows, tributary flows, and surrounding area flows is approximately 358 CFS.

This Project is subject to HCOC mitigation. The 2-Year, 24-Hour unit hydrograph storm event was calculated and it was determined that the site would need to mitigate for volume of approximately 93,600 cubic feet. The underground chambers onsite have been sized to accommodate the HCOC volume. In addition to this and the water quality volume, the underground chambers have been sized to

accommodate the onsite 100-year storm volume (unit hydrograph calculations provided in Appendix A). The 100-year storm will gravity to the proposed Line 4.

OFFSITE

The Project receives runoff from approximately 65 acres easterly of Sherman Road. This tributary area is an existing residential area that is characterized by sheetflow runoff as the streets have no curb and gutters to contain and convey runoff. While there are some minor roadside swales in this tributary area, there is no defined drainage system within the tributary area. Once runoff from the tributary area intersects Sherman Road, runoff ponds on the east side of Sherman Road until enough runoff has accumulated to spillover the centerline of the street and continues to sheetflow across the Project area towards Interstate 215. A number of low flow cross-gutters have been constructed across Sherman Road to relieve the low flow ponding that occurs at several areas along the easterly side of Sherman Road.

Per the Romoland MDP, this area east of Sherman Road is to be picked up by MDP Line A-1 that is to be located in Sherman Road traveling north from the existing MDP Line A channel located just north of McLaughlin Avenue. A preliminary profile for MDP Line A-1 was ran from the existing MDP Line A north in Sherman Road to the mid-point of the Ethanac Logistics Center project frontage, utilizing a minimum grade of 0.3% and preliminary MDP facilities sizes ranging from 39″ to 72″ RCP. This approach showed that once the pipe was to reach Ethanac Road, as a 48″ RCP, the cover over the storm drain pipe was approximately one foot. As the pipe extended north of Ethanac Road it was modeled as a 42″ RCP and the cover over the facility became non-existent with approximately 1-2′ of the 42″ RCP above the existing street surface. In addition to the vertical constraints, existing utilities within the Ethanac Road and Sherman Road intersection, and traveling north in Sherman Road, present several horizontal constraints. Some the existing utilities consist of, but are not limited to, gas lines ranging from 2″ to 6″, water lines ranging from 8″ to 20″, sewer lines ranging from 6″ to 18″, 18″ raw water lines, and communications conduit.

Runoff from the Project, the area tributary to the Project, and the surrounding area northerly and westerly of the Project all naturally drain to a culvert crossing of Interstate 215. A total of approximately 235 acres is tributary to the existing Caltrans dual 6′x5′ box culvert crossing underneath Interstate 215 at the west end of Illinois Avenue. Runoff from the area tributary to the box crossing is predominately sheetflow that is collected in a linear basin along the easterly side of Interstate 215 that was constructed with the Classic Pacific Business Park (PM 34082). The Classic Pacific Business Park (PM 34082) also constructed City Line A storm drain in Illinois Avenue (Classic Pacific Business Park Storm Drain Improvement Plans, P8-921 in Appendix D, attached to this memorandum) to collect local runoff, but is not designed to collect the runoff from the approximately 235 acres that is tributary to the Interstate 215 box crossing.

Due to the constructability constraints described above, it was decided to perpetuate the natural drainage pattern of the area. The offsite runoff from the approximately 65 acres of residential land to the east of Sherman Road that is naturally tributary to the Project will be perpetuated across the proposed Project to Trumble Road. The proposed catch basins in Trumble Road will collect as much runoff as possible while the higher flows will continue to sheetflow westerly to Interstate 215 consistent with the direction from the City of Perris. Offsite flows that are collected by the catch basin system will then be conveyed by the proposed Line 4 storm drain in Trumble Road to the Illinois Avenue storm drain. It has been discussed with the City of Perris that a parallel storm drain in Illinois Avenue may be provided for additional capacity if so, required by the City of Perris.

METHODOLOGY

HYDROLOGY

Hydrologic calculations were performed in accordance with the RCFC&WCD Hydrology Manual, dated April 1978. The Rational Method was utilized in determining peak flow rates.

The hydrological parameters, including rainfall values and soil types were derived from the RCFC&WCD Hydrology Manual. The isohyetal maps and soil map have been included in Section 2.

Rational Method calculations were performed using a computer program developed by CivilDesign Corporation and Joseph E. Bonadiman and Associates Inc. The computer program is commonly referred to as CivilD which incorporates the hydrological parameters outlined in the RCFC&WCD Hydrology Manual.

The Rational Method was used to determine the peak flow rates to size and design the drainage facilities need to convey onsite flows through the site to the proposed underground chamber. The flow rates were computed by generating a hydrologic "link-node" model in which the overall area is divided into separate drainage sub-areas, each tributary to a concentration point (node) determined by the proposed layout and grading.

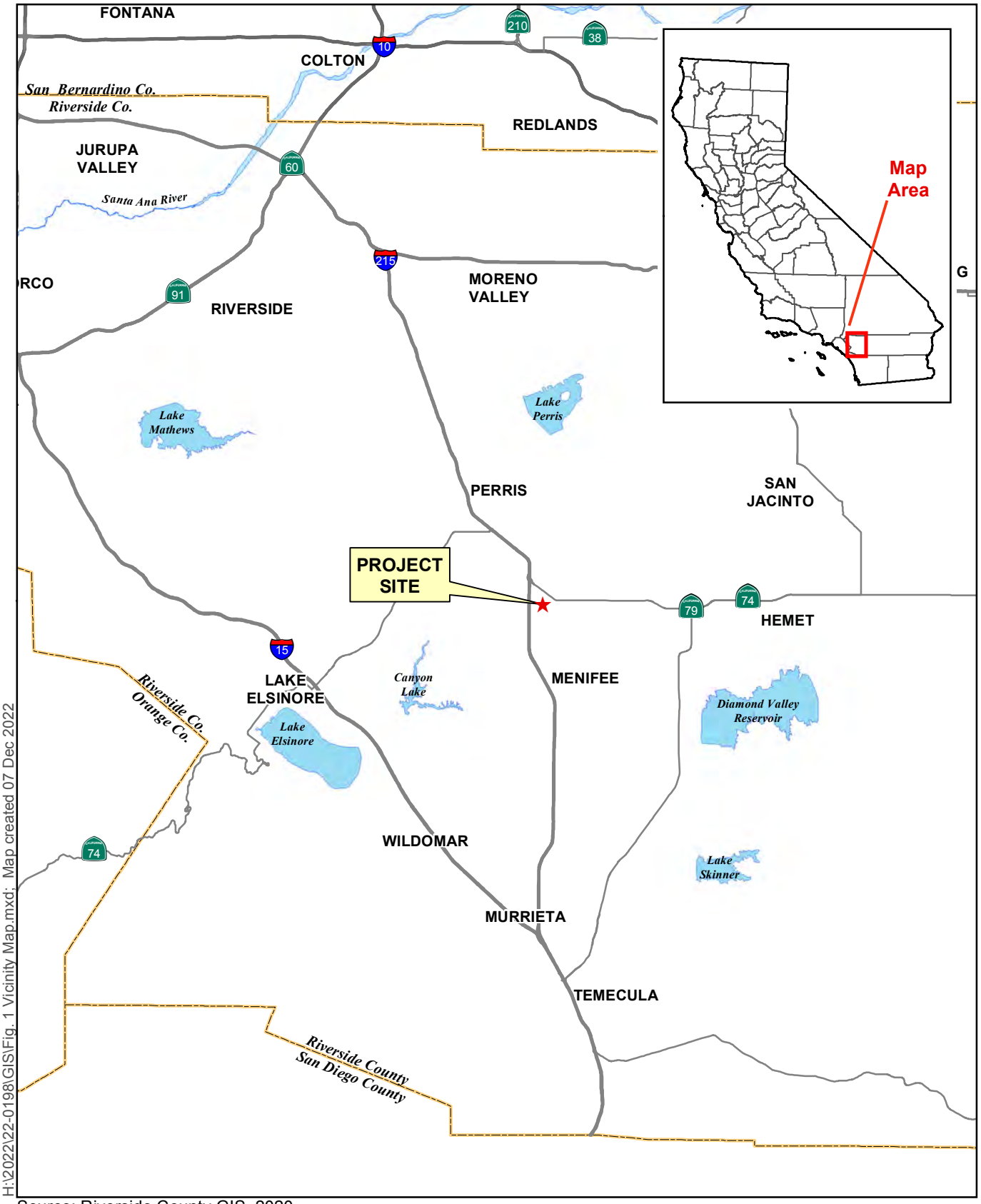
The Unit Hydrograph Method was used to determine the peak flow rates and volumes associated with the 2-year, 24-hour storm events for the site. Calculations were performed for both the existing condition and developed condition to be used in the HCOC mitigation analysis.

HYDRAULICS

Hydraulic calculations to determine the required pipe sizes of proposed storm drain facilities will be provided in the Final Drainage Study.

Preliminary hydraulic calculations to determine capacity of City Line A with added project flows are provided in Appendix B.

FIG. 1 VICINITY MAP
FIG. 2 USGS TOPOGRAPHY MAP
FIG. 3 AERIAL PHOTOGRAPH
FIG. 4 RECEIVING WATERBODIES
FIG. 5 SOILS MAP



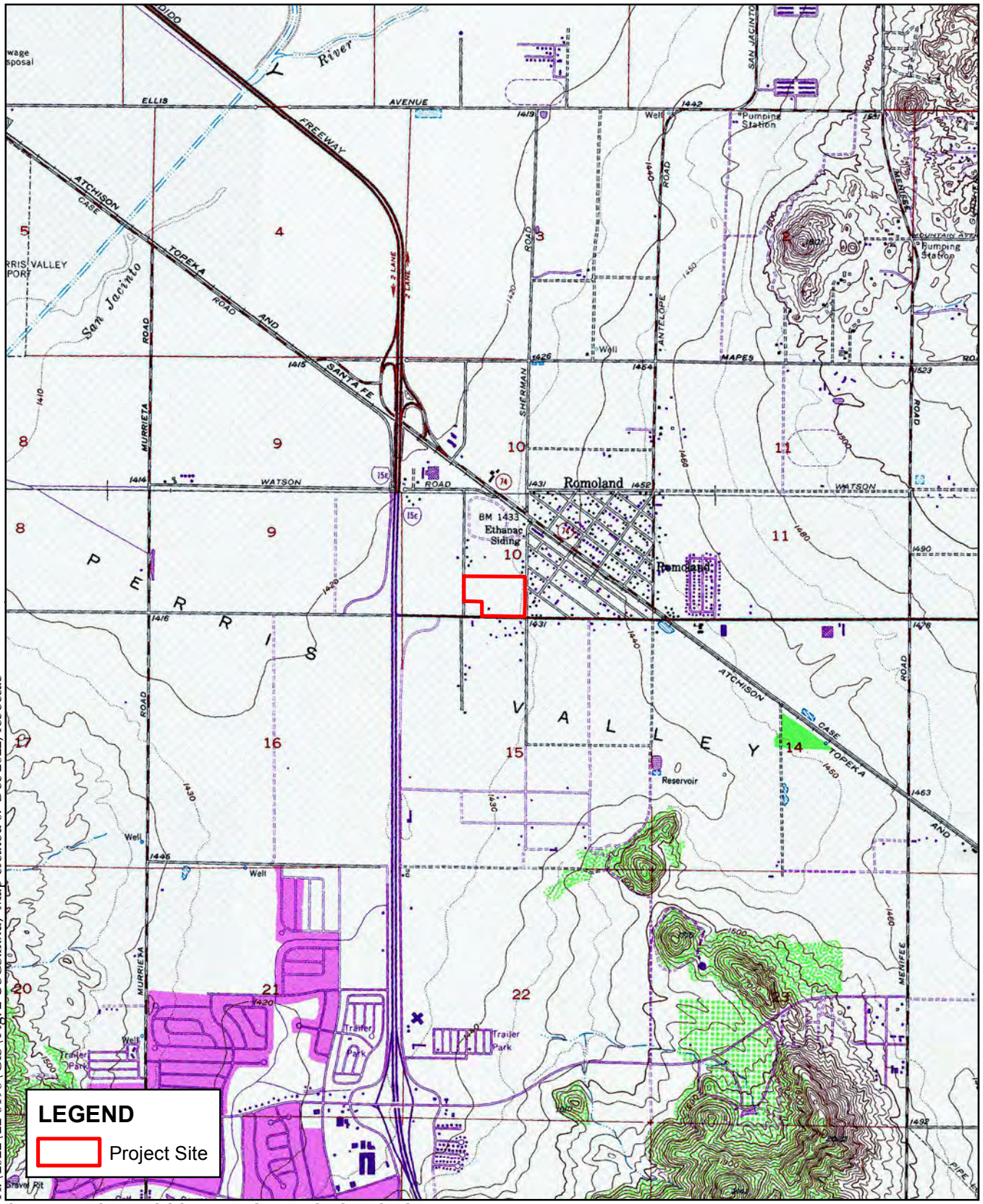
H:\2022\22-0198\GIS\Fig. 1 Vicinity Map.mxd; Map created 07 Dec 2022

Source: Riverside County GIS, 2020

Figure 1 – Vicinity Map

Ethanac Logistics Center

ALBERT A. WEBB ASSOCIATES



H:\2022\22-0198\GIS\Fig. 2 USGS.mxd; Map created 07 Dec 2022; rebeccab

Sources: ESRI / USGS 7.5min Quads: CUCAMONGA PEAK, DEVORE, GUASTI, FONTANA

Figure 2 - USGS Map

Ethanac Logistics Center

ALBERT A. WEBB ASSOCIATES

H:\2022\22-0198\GIS\Pro\Pro\Pro.aprx; Map created 17 Apr 2023

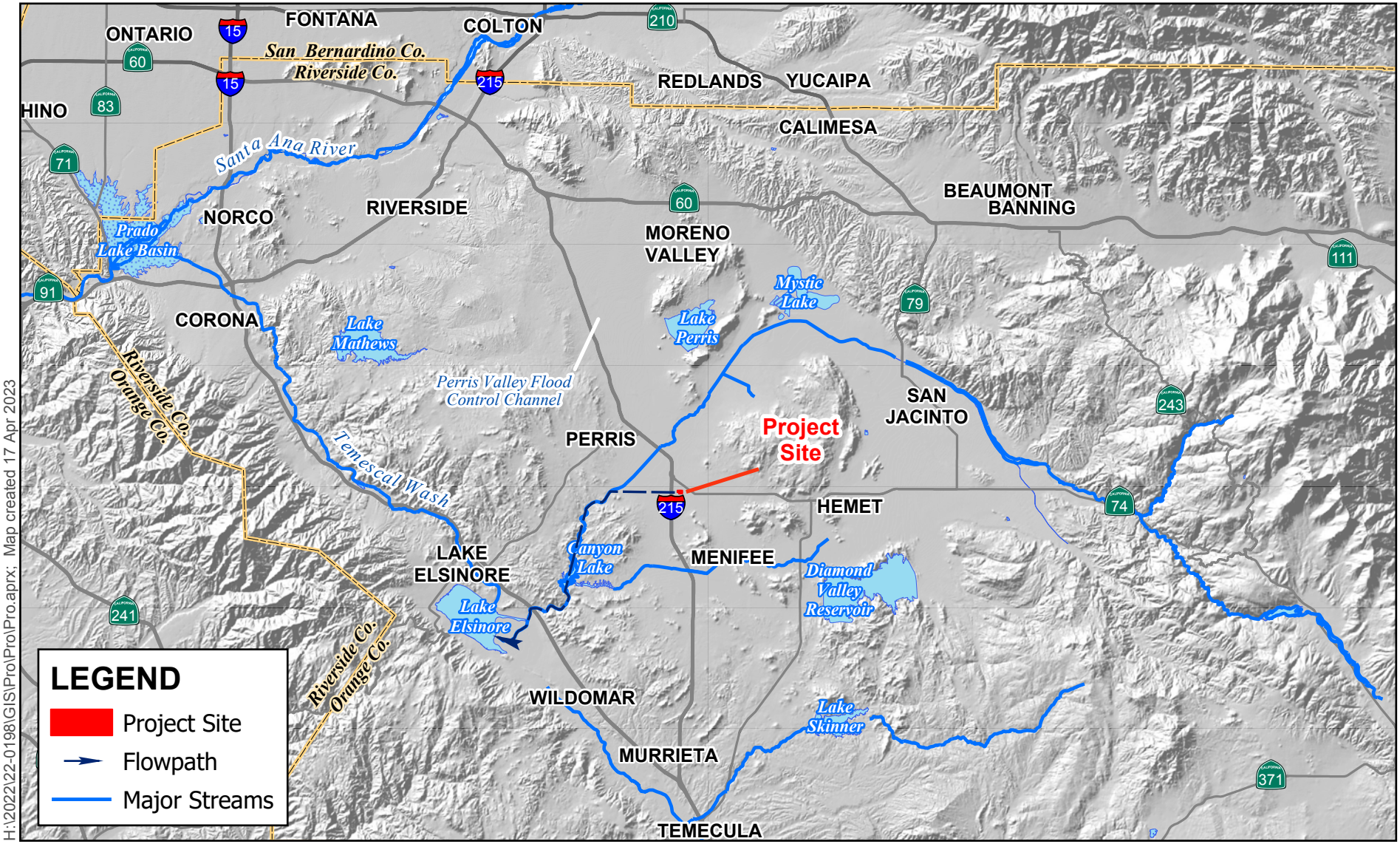
Sources: Riverside Co. GIS, 2022.

0 500 1,000 1,500 Feet

Figure 3 - Aerial Map

Ethanac Logistics Center

ALBERT A. WEBB ASSOCIATES



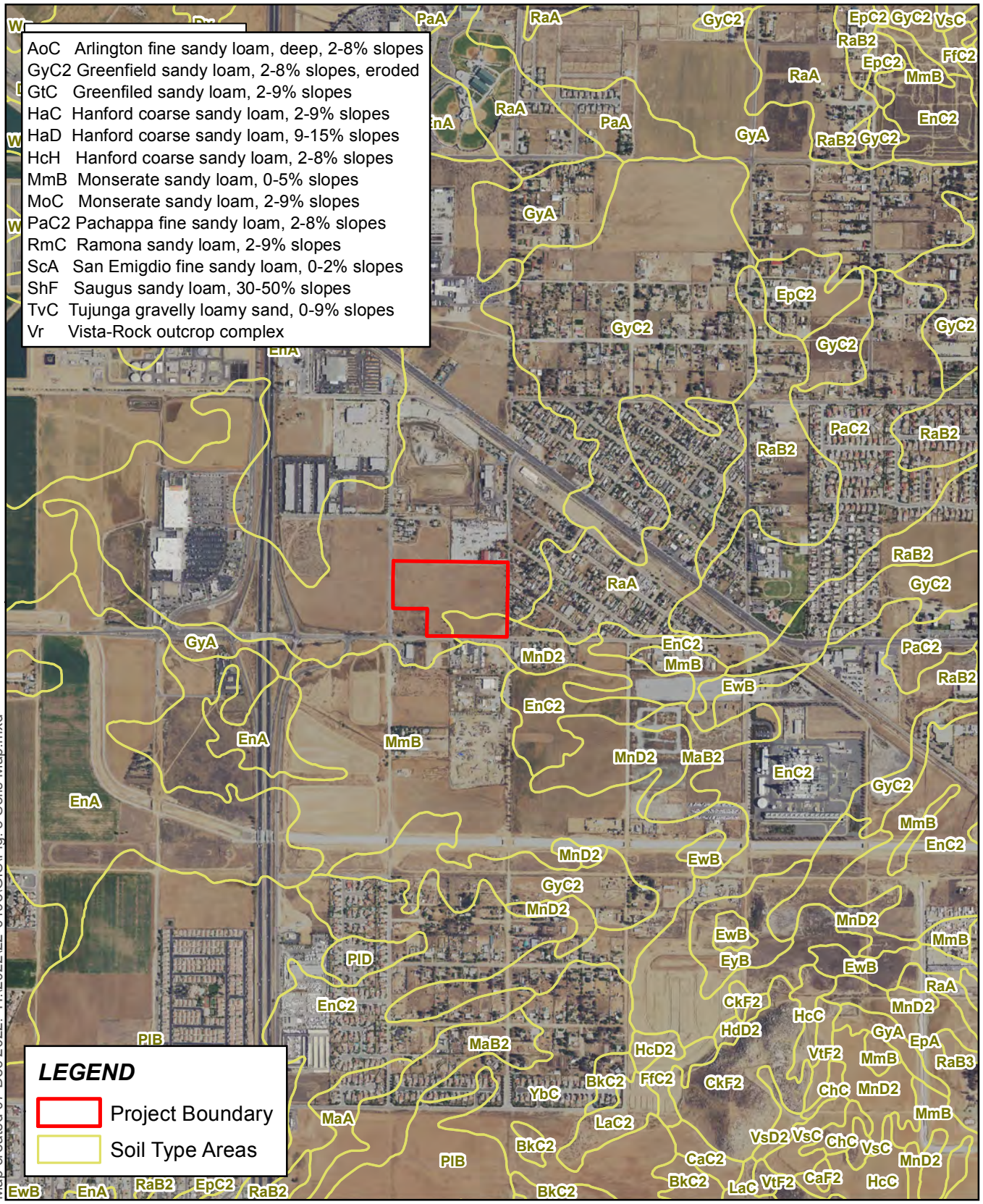
H:\2022\22-0198\GIS\Pro\Pro.aprx; Map created 17 Apr 2023

Sources: US NHD; USGS 30 Meter DEM

Figure 4 – Receiving Waterbodies

Ethanac Logistics Center

ALBERT A. WEBB ASSOCIATES



Sources: USDA NRCS SSURGO, 2015;
Riverside Co. GIS, 2020; USDA NAIP, 2016.

0 1,000 2,000 3,000 Feet

Figure 5 – Soils Map

Ethanac Logistics Center

ALBERT A. WEBB ASSOCIATES

SECTION 2 - HYDROLOGY ANALYSIS

HYDROLOGY PARAMETERS

The RCFC&WCD Hydrology Manual was used to determine several of the hydrological parameters. The following rainfall depths were utilized in the hydrology analyses, which were obtained from the isohyetal maps provided in the RCFC&WCD Hydrology Manual:

Table 1 – Precipitation

	Duration	
Storm Event	1-Hour (inches)	24-Hour (inches)
2-Year	0.46	1.6
100-Year	1.24	4.0

The value for slope of intensity was determined to be 0.61. The isohyetal maps have been included in Appendix A.

Based on the Plate C-1.42 - Romoland in the RCFC&WCD Hydrology Manual, the project site is classified as soil type D. The soils map is included in Appendix A.

The cover type was determined based on the existing land cover and proposed land use of the site. Hydrological computations for the existing condition were done using 'Natural Grass'. The Commercial Landscaping cover type was used to represent the developed condition. The table below summarizes the runoff index values and the recommended values for percentage of impervious cover for each category:

Table 2 – Cover Type

Cover Type	Soil Group A	Soil Group B	Soil Group C	Soil Group D	Percentage of Impervious Cover
Existing Condition Natural Grass	67	78	86	89	0.0%
Developed Condition Commercial Landscaping	32	56	69	75	90%

ON-SITE RATIONAL METHOD HYDROLOGY

The rational method was used to determine peak flow rates in order to adequately size the proposed subsurface storm drains and associated inlets used to convey on-site flows to the underground storage chamber.

There are two onsite storm drain systems, Line 1 (200-series nodes) and Line 2 (300-series nodes) that drain into the underground chambers. Line 1 drains from the southwest portion of the building and Line 2 drains from the east side of the building. There are also a few inlets on the west side trailer parking area with short laterals punching directly into the underground chamber. These three areas make up one

DMA for the site. The underground storage chamber is pumped through a treatment box and then leaves the site via proposed storm drain Line 4 in Trumble Road, that connects to City Line A in Illinois Avenue per P8-921. City Line A ultimately connects to MDP Line A-11. The water quality pump is estimated to be 86 GPM; a maximum of 1 CFS of onsite flows will be pumped into Line 4 at a time. Flows in Line 4 will be discussed further below.

The following table summarizes the rational method results at key points:

Table 3 – Onsite Rational Method Results

Point of Interest	10-Year Peak Flow Rate (cfs)	100-Year Peak Flow Rate (cfs)
Node 201 – Line 1 Total Flows	2.7	4.1
Node 304 – Line 2 Total Flows	14.9	22.5
Node 104 – Total Flows for the Site	28.4	44.0

The rational method output files and hydrology map have been included in Appendix A.

OFF-SITE RATIONAL METHOD HYDROLOGY

The rational method was used to determine peak flow rates in order to adequately size the proposed subsurface storm drains and associated inlets used to convey off-site flows to the proposed storm drain connection. As mentioned previously, offsite flows are collected by reverse under-sidewalk drains in Sherman Road, represented by Nodes 402-404 on the Rational Hydrology Map. The peak flow from the offsite area totals 111 CFS, per the 100-year 1-hour unit hydrograph for the offsite area, as shown in "A11TRIB1000SERIES" in Appendix A.

As previously stated in Section 1, these flows were originally planned to go to MDP Line A-1. However, as discussed in Section 1, the construction of Line A-1 has been deemed infeasible. These flows will be conveyed from the under-sidewalk drains via proposed channel to the north end of the site, and then westerly across the site along the northern driveway. The proposed catch basins in Trumble Road will collect as much runoff as possible while the higher flows will continue to sheetflow westerly to Interstate 215 consistent with the direction from the City of Perris. Offsite flows that are collected by the catch basin system will then be conveyed by the proposed Line 4 storm drain in Trumble Road to the Illinois Avenue storm drain. It has been discussed with the City of Perris that a parallel storm drain in Illinois Avenue may be provided for additional capacity if so, required by the City of Perris.

Offsite flows from the improved half of Trumble Road are collected by a catch basin at Node 501. These flows are conveyed in Line 4 with the pumped Project flow. Rational method calculations for this area can be found in Appendix A.

As described in the previous section, Line 4 connects to the existing City Line A in Illinois Avenue, denoted by Node 406 on the Rational Hydrology map. The invert elevation at this point of connection is shown on the Line A storm drain plan as approximately 1419.3 (NGVD29) and it is called out as 1421.8 (NAVD88) on the Rational Method Hydrology map. City Line A then connects to MDP Line A-11 via 6'x5' RCB under the I-215 per the "Perris Crossing Temporary Earth Channel, Romoland MDP Line A11 and Laterals" P-397 plans, referenced in Appendix D. This RCB yields a flow capacity of approximately 404 CFS to MDP Line A-11. The total confluence flows through City Line A in Illinois, including Ethanac Logistics Center flows, tributary flows, and surrounding area flows is approximately 358 CFS. The

existing condition unit hydrograph calculations for this tributary area can be found in Appendix A and summarized in Table 5 and 6 below.

The following table summarizes the rational method results at key points:

Table 4 – Offsite Rational Method Results

Point of Interest	10-Year Peak Flow Rate (cfs)	100-Year Peak Flow Rate (cfs)
Node 405 – Offsite Tributary Area	-	110.0
Node 501 – Trumble Road Half Improvement Flows		2.7
Node 407 – City Line A Existing Flows	-	8.9

Table 5 – Offsite Unit Hydrograph Results

		Existing Condition		Proposed Condition	
Analysis Area	Storm Event	Volume (Ac-ft)	Peak Flow (cfs)	Volume (Ac-ft)	Peak Flow (cfs)
Ethanac Logistics Center Project	100-Year, 1-Hour	1.75	47.1	1.89	67.7
	100-Year, 3-Hour	2.44	28.6	2.86	34.9
	100-Year, 6-Hour	2.75	24.0	3.65	30.7
	100-Year, 24-Hour	3.06	8.3	5.59	9.9
Area East of Sherman Rd Tributary to Ethanac Logistics Center	100-Year, 1-Hour	5.2	110.8	-	-
	100-Year, 3-Hour	6.9	73.3	-	-
	100-Year, 6-Hour	8.3	64.8	-	-
	100-Year, 24-Hour	11.2	20.7	-	-
Total Area Tributary to A-11	100-Year, 1-Hour	20.62	404.4	-	-
	100-Year, 3-Hour	28.78	289.3	-	-
	100-Year, 6-Hour	33.97	249.8	-	-
	100-Year, 24-Hour	46.18	93.0	-	-

Table 6 summarizes the flows for the total area tributary to the existing Caltrans dual 6'x5' box culvert crossing in post-development condition of the Project. The total proposed flow rate is calculated by subtracting out the existing Project flows and replacing with the proposed pumped Project flow of 1 cfs.

Table 6 –Total Area Proposed Condition Flows

		Proposed Condition
Analysis Area	**Storm Event**	**Peak Flow (cfs)**
Total Area Tributary to A-11	100-Year, 1-Hour	358.3
	100-Year, 3-Hour	261.7
	100-Year, 6-Hour	226.8
	100-Year, 24-Hour	85.7

See Appendix A for the output files of the off-site rational method analysis and unit hydrograph analysis. See Appendix B for hydraulic calculations regarding sizing of offsite storm drain facilities.

SECTION 3 - HYDRAULIC ANALYSIS

ON-SITE STORM DRAIN FACILITIES

Onsite hydraulic analysis was not taken into consideration for the preliminary drainage.

OFF-SITE STORM DRAIN FACILITIES

Offsite hydraulic analysis was taken into consideration for the preliminary drainage. Due to the nature of adding onsite project flows and offsite tributary flows to the existing City Line A in Illinois Avenue, the capacity of City Line A needed to be evaluated for its ability to handle the additional flows prior to outletting into the MDP Line A-11.

The existing city-maintained Line A in Illinois Avenue consists of 36" RCP at the proposed connection location and 48" RCP downstream, before it outlets at Station 10+00 to a forebay structure which then connects MDP Line A-11 via 6'x5' double RCB, per P8-921, referenced in Appendix D.

The WSPG Program was run for City Line A, simply adding in 17 CFS from Line 4 in Trumble Road. The addition of the proposed Ethanac Logistics Center pumped project flows, chamber emergency escape flows, and Trumble Road flows put the existing City Line A under pressure, but it would not cause ponding at the existing catch basins in Illinois Avenue. The WSPG calculations are referenced in Appendix B.

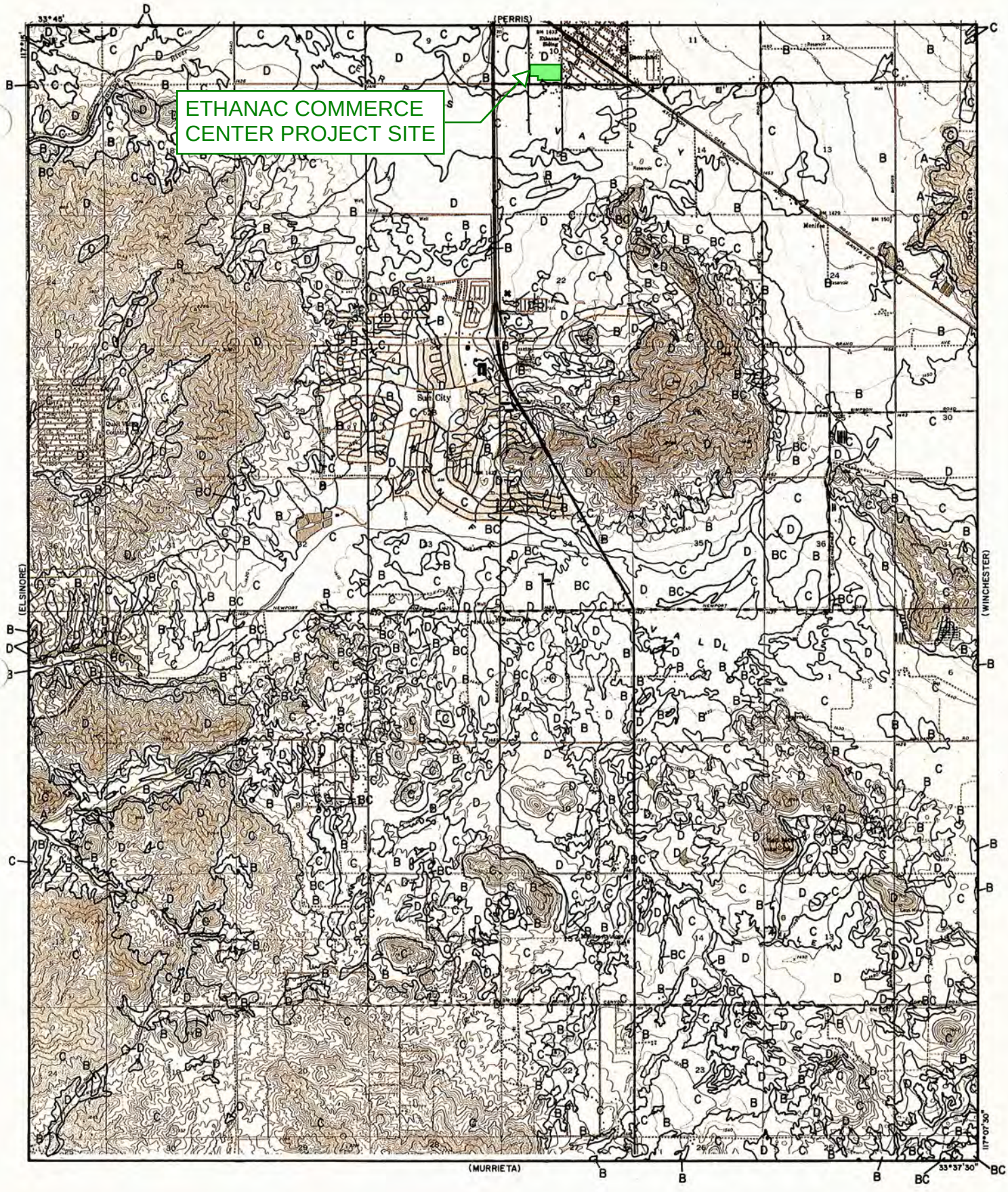
SECTION 4 - CONCLUSION

Based on the analyses and results of this report, the following conclusions were derived from the hydrology and hydraulic results:

- The proposed drainage improvements will adequately convey flows to the underground chamber and provide flood protection for the 100-year storm event.
- The proposed treatment box will provide adequate water quality treatment.
- Offsite flows will be perpetuated across the site and remain comparable to the existing drainage pattern.
- The proposed project will not impact flooding condition to upstream or downstream properties.

APPENDIX A – HYDROLOGY ANALYSIS

HYDROLOGIC SOILS GROUP MAP (PLATE C-1.42)



LEGEND

——— SOILS GROUP BOUNDARY

A SOILS GROUP DESIGNATION

RCFC & WCD

HYDROLOGY MANUAL

0 FEET 5000

HYDROLOGIC SOILS GROUP MAP FOR ROMOLAND

PLATE C-1.42

ISOHYETAL MAPS

R 07 W | R 06 W | R 05 W | R 04 W | R 03 W | R 02 W | R 01 W | R 01 E | R 02 E | R 03 E | R 04 E | R 05 E

T 01 S
T 02 S
T 03 S
T 04 S
T 05 S
T 06 S
T 07 S
T 08 S

0.85 MiraLoma
0.61 Riverside North
0.68 PigeonPass
0.54 Riverside South
0.66 MorenoEast
0.85 Beaumont
0.88 PradoDam
0.51 Woodcrest
0.50 LakeMathews
0.68 PerrisReservoir
0.87 VistaGrandeGS
0.70 SanJacintoNWS
1.18 Idyllwild
0.58 SunCity
0.68 Winchester
0.70 ElsinoreNWS
1.11 ElCarisoStation
0.90 HurkeyCreek
0.77 WildomarLaCresta
0.52 SkinnerLake
0.65 Anza
0.77 SantaRosaPlateau
1.00 TemeculaNWS
0.64 AguangaValley

Ethanac Commerce Center Project Site

Santa Ana River Watershed
Santa Margarita Watershed

JURUPA VALLEY | EASTVALE | NORCO | CORONA | RIVERSIDE | MORENO VALLEY | CALIMESA | BEAUMONT | SAN JACINTO | PERRIS | CANYON LAKE | LAKE ELSINORE | WILDOMAR | MENIFEE | MURRIETA | HEMET | TEMECULA

06	05	04	03	02	01
07	08	09	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

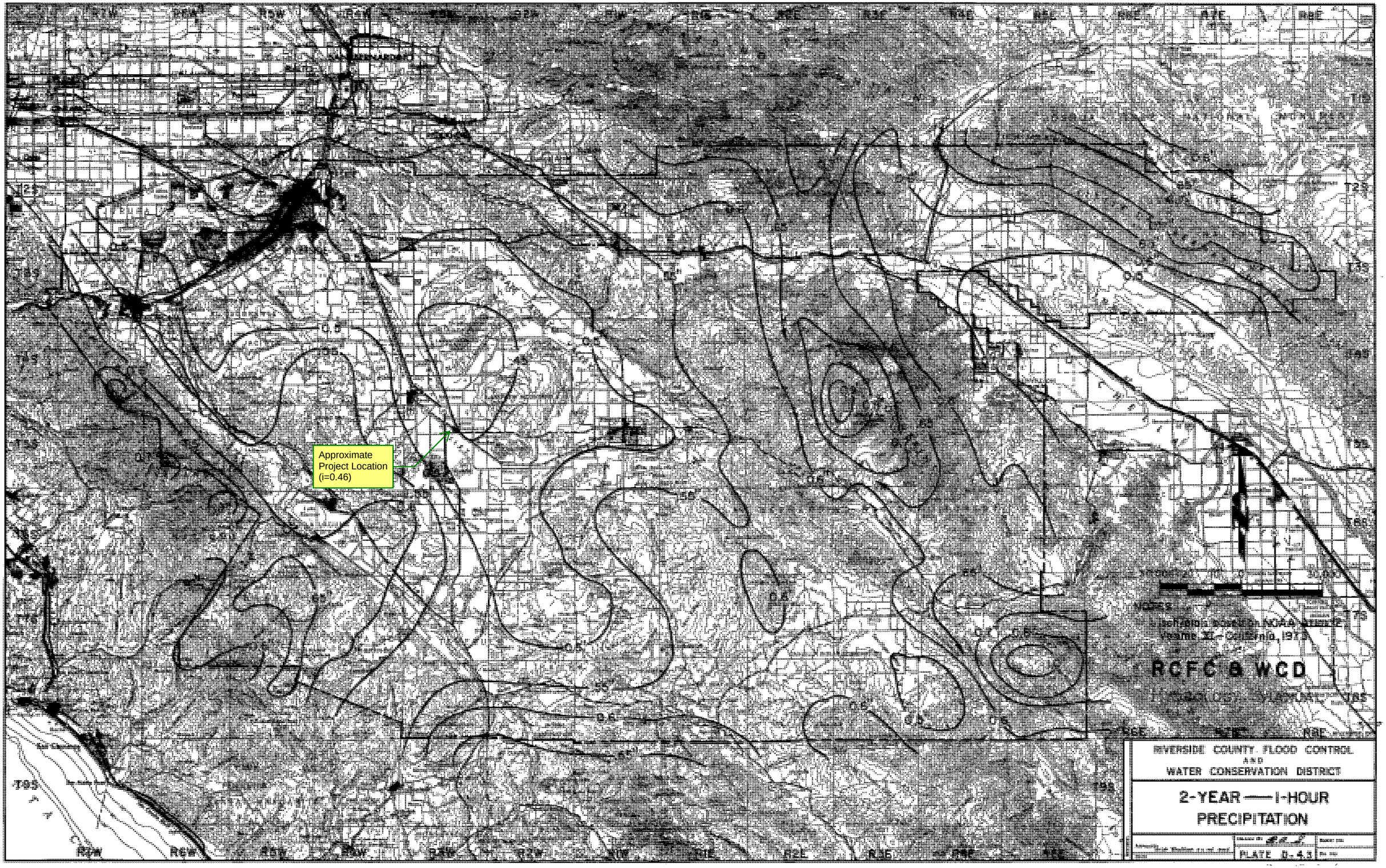
N

Rain Gage Locations

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

Isohyetal Map for the 85th Percentile 24 hour Storm Event

July 2011


Approximate
Project Location
(i=0.46)
NOTES
1. Isohyetals based on NOAA Atlas 2
Volume XI - California, 1973
RCFC & WCD
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
2-YEAR — 1-HOUR
PRECIPITATION
PLATE D-4.5

Approximate Project Location (i=1.6)

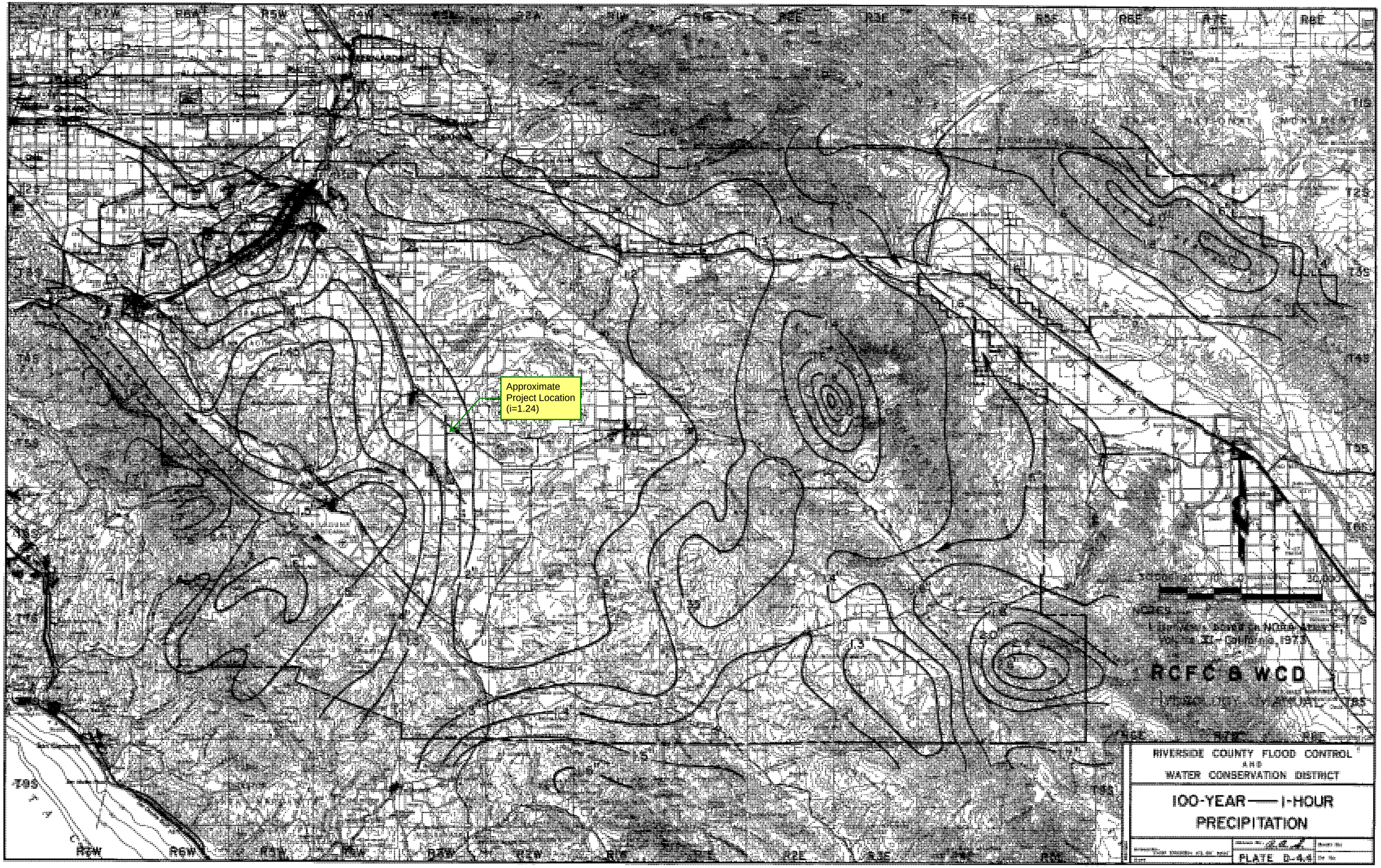
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

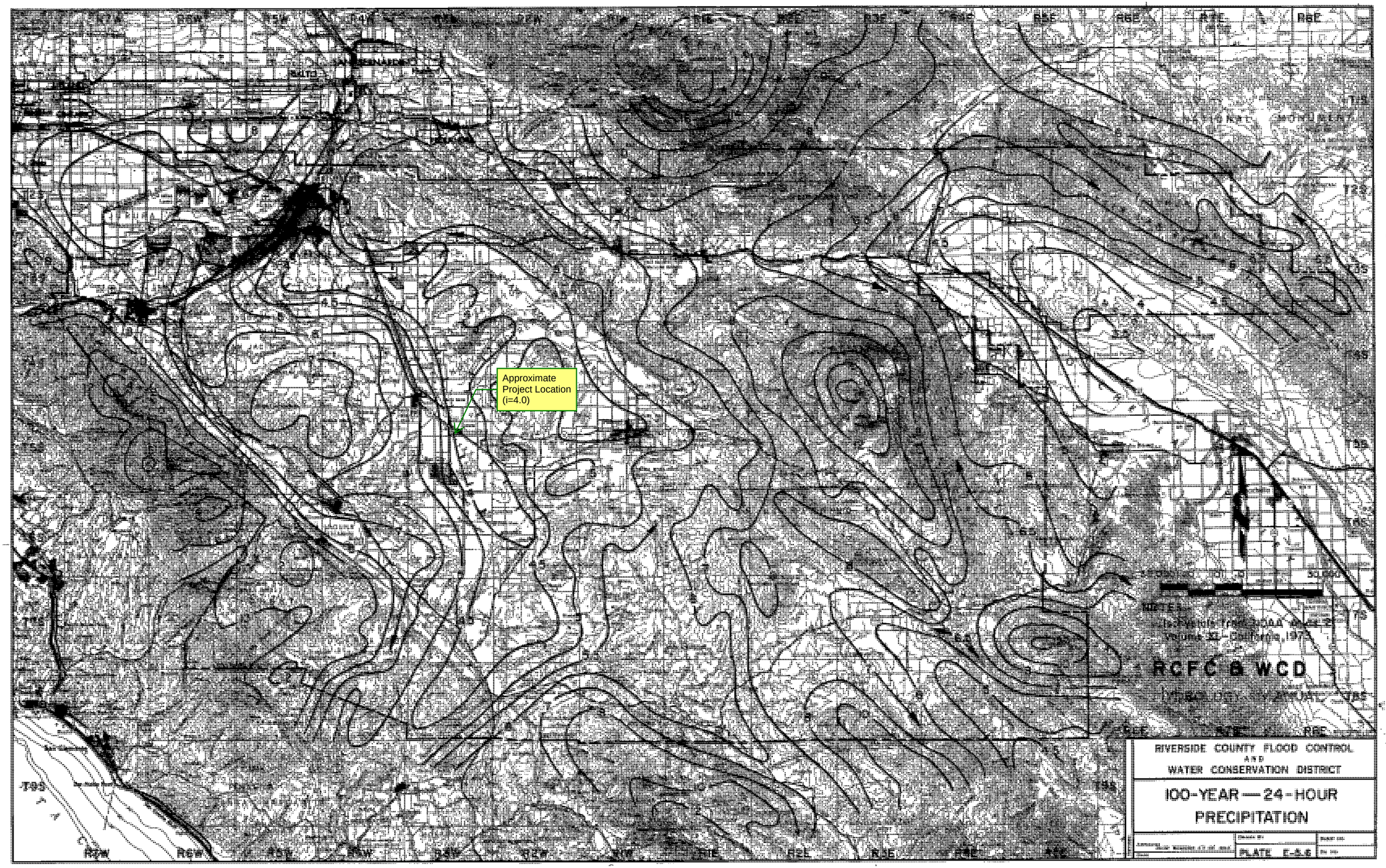
2-YEAR — 24-HOUR PRECIPITATION

PLATE E-5.5

NOAA Atlas 2, Volume XI, California, 1973

RCFC & WCD


Approximate
Project Location
(i=1.24)
RCFC & WCD
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR — 1-HOUR
PRECIPITATION
PLATE D-4.4


Approximate
Project Location
(i=4.0)
RCFC & WCD
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR — 24-HOUR
PRECIPITATION
PLATE E-6.6

RAINFALL INTENSITY–INCHES PER HOUR

DURATION MINUTES	HEMET FREQUENCY 10 YEAR	HEMET FREQUENCY 100 YEAR	DURATION MINUTES	HIGHGROVE FREQUENCY 10 YEAR	HIGHGROVE FREQUENCY 100 YEAR	DURATION MINUTES	HOMELAND – WINCHESTER FREQUENCY 10 YEAR	HOMELAND – WINCHESTER FREQUENCY 100 YEAR	DURATION MINUTES	IDYLLWILD FREQUENCY 10 YEAR	IDYLLWILD FREQUENCY 100 YEAR	DURATION MINUTES	LAKEVIEW FREQUENCY 10 YEAR	LAKEVIEW FREQUENCY 100 YEAR
5	2.84	4.40	5	3.02	4.37	5	2.91	4.37	5	4.91	7.28	5	2.77	4.16
6	2.58	4.00	6	2.75	3.97	6	2.65	3.97	6	4.47	6.62	6	2.53	3.79
7	2.37	3.68	7	2.54	3.67	7	2.44	3.67	7	4.13	6.11	7	2.34	3.51
8	2.21	3.43	8	2.37	3.42	8	2.28	3.42	8	3.85	5.70	8	2.19	3.29
9	2.08	3.23	9	2.23	3.22	9	2.15	3.22	9	3.62	5.36	9	2.07	3.10
10	1.96	3.05	10	2.11	3.05	10	2.03	3.05	10	3.43	5.08	10	1.96	2.94
11	1.87	2.90	11	2.01	2.90	11	1.93	2.90	11	3.26	4.83	11	1.87	2.80
12	1.78	2.77	12	1.92	2.77	12	1.85	2.77	12	3.12	4.62	12	1.79	2.68
13	1.71	2.65	13	1.84	2.66	13	1.77	2.66	13	2.99	4.43	13	1.72	2.58
14	1.64	2.55	14	1.77	2.56	14	1.71	2.56	14	2.88	4.26	14	1.66	2.48
15	1.58	2.46	15	1.71	2.47	15	1.64	2.47	15	2.78	4.11	15	1.60	2.40
16	1.53	2.38	16	1.65	2.39	16	1.59	2.39	16	2.68	3.98	16	1.55	2.32
17	1.48	2.30	17	1.60	2.31	17	1.54	2.31	17	2.60	3.85	17	1.50	2.25
18	1.44	2.23	18	1.55	2.24	18	1.50	2.24	18	2.52	3.74	18	1.46	2.19
19	1.40	2.17	19	1.51	2.18	19	1.45	2.18	19	2.45	3.64	19	1.42	2.13
20	1.36	2.11	20	1.47	2.12	20	1.42	2.12	20	2.39	3.54	20	1.39	2.08
22	1.29	2.01	22	1.40	2.02	22	1.35	2.02	22	2.27	3.37	22	1.32	1.98
24	1.24	1.92	24	1.34	1.93	24	1.29	1.93	24	2.17	3.22	24	1.26	1.90
26	1.18	1.84	26	1.28	1.85	26	1.24	1.85	26	2.09	3.09	26	1.22	1.82
28	1.14	1.77	28	1.23	1.78	28	1.19	1.78	28	2.01	2.97	28	1.17	1.76
30	1.10	1.70	30	1.19	1.72	30	1.15	1.72	30	1.94	2.87	30	1.13	1.70
32	1.06	1.65	32	1.15	1.66	32	1.11	1.66	32	1.87	2.77	32	1.10	1.64
34	1.03	1.59	34	1.12	1.61	34	1.07	1.61	34	1.81	2.69	34	1.06	1.59
36	1.00	1.55	36	1.08	1.57	36	1.04	1.57	36	1.76	2.61	36	1.03	1.55
38	.97	1.50	38	1.05	1.52	38	1.01	1.52	38	1.71	2.54	38	1.01	1.51
40	.94	1.46	40	1.02	1.48	40	.99	1.48	40	1.67	2.47	40	.98	1.47
45	.89	1.37	45	.96	1.39	45	.93	1.39	45	1.57	2.32	45	.92	1.39
50	.84	1.30	50	.91	1.32	50	.88	1.32	50	1.48	2.20	50	.88	1.31
55	.80	1.24	55	.87	1.26	55	.84	1.26	55	1.41	2.09	55	.84	1.25
60	.76	1.18	60	.83	1.20	60	.80	1.20	60	1.35	2.00	60	.80	1.20
65	.73	1.13	65	.80	1.15	65	.77	1.15	65	1.29	1.92	65	.77	1.15
70	.70	1.09	70	.77	1.11	70	.74	1.11	70	1.25	1.85	70	.74	1.11
75	.68	1.05	75	.74	1.07	75	.71	1.07	75	1.20	1.78	75	.72	1.07
80	.65	1.01	80	.71	1.03	80	.69	1.03	80	1.16	1.72	80	.69	1.04
85	.63	.98	85	.69	1.00	85	.67	1.00	85	1.13	1.67	85	.67	1.01
SLOPE =	.530		SLOPE =	.520		SLOPE =	.520		SLOPE =	.520		SLOPE =	.500	

RCFC & WCD

HYDROLOGY MANUAL

STANDARD INTENSITY–DURATION CURVES DATA

PLATE D-4.1 (3 of 6)

10-YEAR ONSITE HYDROLOGY (RATIONAL METHOD)

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2018 Version 9.0
Rational Hydrology Study Date: 01/18/24 File:PROP10ONSITE.out

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22-0198 - ETHANAC COMMERCE CENTER
ONSITE RATIONAL METHOD HYDROLOGY
10 YEAR STORM EVENT
FN: PROP10.OUT RSB

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6586

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 10.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Homeland-Winchester] area used.
10 year storm 10 minute intensity = 2.030(In/Hr)
10 year storm 60 minute intensity = 0.800(In/Hr)
100 year storm 10 minute intensity = 3.050(In/Hr)
100 year storm 60 minute intensity = 1.200(In/Hr)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.800(In/Hr)
Slope of intensity duration curve = 0.5200

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Process from Point/Station 100.000 to Point/Station 101.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 707.000(Ft.)
Top (of initial area) elevation = 1433.000(Ft.)
Bottom (of initial area) elevation = 1427.600(Ft.)
Difference in elevation = 5.400(Ft.)
Slope = 0.00764 s(percent)= 0.76
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 10.972 min.
Rainfall intensity = 1.935(In/Hr) for a 10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.883

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Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      7.179(CFS)
Total initial stream area =        4.200(Ac.)
Pervious area fraction = 0.100


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Process from Point/Station      101.000 to Point/Station      104.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1422.600(Ft.)
Downstream point/station elevation =  1413.600(Ft.)
Pipe length  =   293.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.179(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     7.179(CFS)
Normal flow depth in pipe =    8.67(In.)
Flow top width inside pipe =   14.82(In.)
Critical Depth =   12.86(In.)
Pipe flow velocity =      9.77(Ft/s)
Travel time through pipe =    0.50 min.
Time of concentration (TC) =    11.47 min.


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Process from Point/Station      101.000 to Point/Station      104.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      4.200(Ac.)
Runoff from this stream =      7.179(CFS)
Time of concentration =   11.47 min.
Rainfall intensity =     1.891(In/Hr)
Program is now starting with Main Stream No. 2


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Process from Point/Station      103.000 to Point/Station      102.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   529.000(Ft.)
Top (of initial area) elevation =  1433.000(Ft.)
Bottom (of initial area) elevation =  1427.600(Ft.)
Difference in elevation =     5.400(Ft.)
Slope =    0.01021  s(percent)=       1.02
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.220 min.
Rainfall intensity =      2.119(In/Hr) for a    10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.884
Decimal fraction soil group A = 0.000
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Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      5.247(CFS)
Total initial stream area =        2.800(Ac.)
Pervious area fraction = 0.100


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Process from Point/Station      102.000 to Point/Station      104.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1422.600(Ft.)
Downstream point/station elevation =  1413.600(Ft.)
Pipe length  =    70.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.247(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     5.247(CFS)
Normal flow depth in pipe =    6.57(In.)
Flow top width inside pipe =    7.99(In.)
Critical depth could not be calculated.
Pipe flow velocity =     15.16(Ft/s)
Travel time through pipe =    0.08 min.
Time of concentration (TC) =     9.30 min.


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Process from Point/Station      102.000 to Point/Station      104.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      2.800(Ac.)
Runoff from this stream =      5.247(CFS)
Time of concentration =    9.30 min.
Rainfall intensity =     2.110(In/Hr)
Program is now starting with Main Stream No. 3


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Process from Point/Station      200.000 to Point/Station      201.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   356.000(Ft.)
Top (of initial area) elevation =  1434.100(Ft.)
Bottom (of initial area) elevation =  1429.500(Ft.)
Difference in elevation =     4.600(Ft.)
Slope =    0.01292  s(percent)=       1.29
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.507 min.
Rainfall intensity =      2.358(In/Hr) for a    10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.886
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
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Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      2.715(CFS)
Total initial stream area =        1.300(Ac.)
Pervious area fraction = 0.100


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Process from Point/Station      201.000 to Point/Station      104.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1426.500(Ft.)
Downstream point/station elevation =  1413.600(Ft.)
Pipe length  =   740.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.715(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     2.715(CFS)
Normal flow depth in pipe =    6.54(In.)
Flow top width inside pipe =   11.95(In.)
Critical Depth =    8.48(In.)
Pipe flow velocity =      6.20(Ft/s)
Travel time through pipe =    1.99 min.
Time of concentration (TC) =     9.49 min.


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Process from Point/Station      201.000 to Point/Station      104.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =      1.300(Ac.)
Runoff from this stream =      2.715(CFS)
Time of concentration =    9.49 min.
Rainfall intensity =     2.087(In/Hr)
Program is now starting with Main Stream No. 4


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Process from Point/Station      300.000 to Point/Station      301.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   556.000(Ft.)
Top (of initial area) elevation =  1434.100(Ft.)
Bottom (of initial area) elevation =  1427.300(Ft.)
Difference in elevation =     6.800(Ft.)
Slope =    0.01223  s(percent)=       1.22
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.071 min.
Rainfall intensity =      2.137(In/Hr) for a    10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.885
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
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Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      6.804(CFS)
Total initial stream area =        3.600(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      301.000 to Point/Station      302.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1424.300(Ft.)
Downstream point/station elevation =  1423.900(Ft.)
Pipe length  =   143.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     6.804(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =     6.804(CFS)
Normal flow depth in pipe =   14.37(In.)
Flow top width inside pipe =   19.52(In.)
Critical Depth =   11.57(In.)
Pipe flow velocity =      3.88(Ft/s)
Travel time through pipe =    0.61 min.
Time of concentration (TC) =     9.69 min.


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Process from Point/Station      303.000 to Point/Station      302.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Runoff Coefficient = 0.884
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =     9.69 min.
Rainfall intensity =      2.065(In/Hr) for a    10.0 year storm
Subarea runoff =      3.104(CFS) for      1.700(Ac.)
Total runoff =      9.907(CFS)      Total area =       5.300(Ac.)


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Process from Point/Station      302.000 to Point/Station      304.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1423.900(Ft.)
Downstream point/station elevation =  1423.400(Ft.)
Pipe length  =   143.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     9.907(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =     9.907(CFS)
Normal flow depth in pipe =   15.38(In.)
Flow top width inside pipe =   23.03(In.)
Critical Depth =   13.52(In.)
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Pipe flow velocity =      4.66(Ft/s)
Travel time through pipe =    0.51 min.
Time of concentration (TC) =    10.20 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      305.000 to Point/Station      304.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Runoff Coefficient = 0.884
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =    10.20 min.
Rainfall intensity =      2.011(In/Hr) for a    10.0 year storm
Subarea runoff =      4.975(CFS) for      2.800(Ac.)
Total runoff =     14.882(CFS)      Total area =       8.100(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      304.000 to Point/Station      104.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1423.400(Ft.)
Downstream point/station elevation =  1413.600(Ft.)
Pipe length  =  1125.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    14.882(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    14.882(CFS)
Normal flow depth in pipe =   17.34(In.)
Flow top width inside pipe =   15.93(In.)
Critical Depth =   17.14(In.)
Pipe flow velocity =      7.01(Ft/s)
Travel time through pipe =    2.68 min.
Time of concentration (TC) =    12.87 min.


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Process from Point/Station      304.000 to Point/Station      104.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 4
Stream flow area =      8.100(Ac.)
Runoff from this stream =     14.882(CFS)
Time of concentration =   12.87 min.
Rainfall intensity =     1.781(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)
```

```
1        7.179     11.47              1.891
2        5.247      9.30              2.110
3        2.715      9.49              2.087
4       14.882     12.87              1.781
Largest stream flow has longer time of concentration
Qp =     14.882 + sum of
          Qb         Ia/Ib
           7.179 *    0.942 =      6.762
          Qb         Ia/Ib
           5.247 *    0.844 =      4.430
          Qb         Ia/Ib
           2.715 *    0.854 =      2.317
Qp =     28.392

Total of 4 main streams to confluence:
Flow rates before confluence point:
       7.179       5.247       2.715      14.882
Area of streams before confluence:
        4.200        2.800        1.300        8.100


Results of confluence:
Total flow rate =     28.392(CFS)
Time of concentration =    12.872 min.
Effective stream area after confluence  =     16.400(Ac.)
End of computations, total study area =           16.40 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number =  75.0
```

100-YEAR ONSITE HYDROLOGY (RATIONAL METHOD)

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2018 Version 9.0
Rational Hydrology Study Date: 01/19/24 File:PROP100ONSITE.out

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22-0198 - ETHANAC LOGISTICS CENTER
ONSITE RATIONAL METHOD HYDROLOGY
100 YEAR STORM EVENT
FN: PROP100.OUT RSB

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6584

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Homeland-Winchester] area used.
10 year storm 10 minute intensity = 2.030(In/Hr)
10 year storm 60 minute intensity = 0.800(In/Hr)
100 year storm 10 minute intensity = 3.050(In/Hr)
100 year storm 60 minute intensity = 1.200(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.200(In/Hr)
Slope of intensity duration curve = 0.5200

++

Process from Point/Station 100.000 to Point/Station 101.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 707.000(Ft.)
Top (of initial area) elevation = 1433.000(Ft.)
Bottom (of initial area) elevation = 1427.600(Ft.)
Difference in elevation = 5.400(Ft.)
Slope = 0.00764 s(percent)= 0.76
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 10.972 min.
Rainfall intensity = 2.903(In/Hr) for a 100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.888

```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =     11.859(CFS)
Total initial stream area =        4.600(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      101.000 to Point/Station      104.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1422.600(Ft.)
Downstream point/station elevation =  1413.600(Ft.)
Pipe length  =   293.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    11.859(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    11.859(CFS)
Normal flow depth in pipe =   10.51(In.)
Flow top width inside pipe =   17.74(In.)
Critical Depth =   15.71(In.)
Pipe flow velocity =     11.07(Ft/s)
Travel time through pipe =    0.44 min.
Time of concentration (TC) =    11.41 min.


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Process from Point/Station      101.000 to Point/Station      104.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      4.600(Ac.)
Runoff from this stream =     11.859(CFS)
Time of concentration =   11.41 min.
Rainfall intensity =     2.844(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      102.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   529.000(Ft.)
Top (of initial area) elevation =  1433.000(Ft.)
Bottom (of initial area) elevation =  1427.600(Ft.)
Difference in elevation =     5.400(Ft.)
Slope =    0.01021  s(percent)=       1.02
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.220 min.
Rainfall intensity =      3.178(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.889
Decimal fraction soil group A = 0.000
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```
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      7.911(CFS)
Total initial stream area =        2.800(Ac.)
Pervious area fraction = 0.100


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Process from Point/Station      102.000 to Point/Station      104.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1422.600(Ft.)
Downstream point/station elevation =  1413.600(Ft.)
Pipe length  =    70.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.911(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     7.911(CFS)
Normal flow depth in pipe =    6.83(In.)
Flow top width inside pipe =   11.88(In.)
Critical depth could not be calculated.
Pipe flow velocity =     17.13(Ft/s)
Travel time through pipe =    0.07 min.
Time of concentration (TC) =     9.29 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      104.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      2.800(Ac.)
Runoff from this stream =      7.911(CFS)
Time of concentration =    9.29 min.
Rainfall intensity =     3.166(In/Hr)
Program is now starting with Main Stream No. 3


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      200.000 to Point/Station      201.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   356.000(Ft.)
Top (of initial area) elevation =  1434.100(Ft.)
Bottom (of initial area) elevation =  1429.500(Ft.)
Difference in elevation =     4.600(Ft.)
Slope =    0.01292  s(percent)=       1.29
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.507 min.
Rainfall intensity =      3.537(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.890
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
```

```
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      4.092(CFS)
Total initial stream area =        1.300(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      201.000 to Point/Station      104.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1426.500(Ft.)
Downstream point/station elevation =  1413.600(Ft.)
Pipe length  =   740.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     4.092(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     4.092(CFS)
Normal flow depth in pipe =    8.65(In.)
Flow top width inside pipe =   10.77(In.)
Critical Depth =   10.27(In.)
Pipe flow velocity =      6.75(Ft/s)
Travel time through pipe =    1.83 min.
Time of concentration (TC) =     9.33 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      201.000 to Point/Station      104.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =      1.300(Ac.)
Runoff from this stream =      4.092(CFS)
Time of concentration =    9.33 min.
Rainfall intensity =     3.158(In/Hr)
Program is now starting with Main Stream No. 4


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      300.000 to Point/Station      301.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   556.000(Ft.)
Top (of initial area) elevation =  1434.100(Ft.)
Bottom (of initial area) elevation =  1427.300(Ft.)
Difference in elevation =     6.800(Ft.)
Slope =    0.01223  s(percent)=       1.22
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.071 min.
Rainfall intensity =      3.205(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.889
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
```

```
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =     10.258(CFS)
Total initial stream area =        3.600(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      301.000 to Point/Station      302.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1424.300(Ft.)
Downstream point/station elevation =  1423.900(Ft.)
Pipe length  =   143.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    10.258(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    10.258(CFS)
Normal flow depth in pipe =   17.11(In.)
Flow top width inside pipe =   21.72(In.)
Critical Depth =   13.76(In.)
Pipe flow velocity =      4.28(Ft/s)
Travel time through pipe =    0.56 min.
Time of concentration (TC) =     9.63 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      303.000 to Point/Station      302.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Runoff Coefficient = 0.889
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =     9.63 min.
Rainfall intensity =      3.107(In/Hr) for a   100.0 year storm
Subarea runoff =      4.695(CFS) for      1.700(Ac.)
Total runoff =     14.953(CFS)      Total area =       5.300(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      302.000 to Point/Station      304.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1423.900(Ft.)
Downstream point/station elevation =  1423.400(Ft.)
Pipe length  =   143.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    14.953(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    14.953(CFS)
Normal flow depth in pipe =   18.54(In.)
Flow top width inside pipe =   25.05(In.)
Critical Depth =   16.16(In.)
```

```
Pipe flow velocity =      5.14(Ft/s)
Travel time through pipe =    0.46 min.
Time of concentration (TC) =    10.09 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      305.000 to Point/Station      304.000
**** SUBAREA FLOW ADDITION ****
----------------------------------------------------------------------------
COMMERCIAL subarea type
Runoff Coefficient = 0.888
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =    10.09 min.
Rainfall intensity =      3.032(In/Hr) for a   100.0 year storm
Subarea runoff =      7.543(CFS) for      2.800(Ac.)
Total runoff =     22.496(CFS)      Total area =       8.100(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      304.000 to Point/Station      104.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------------
Upstream point/station elevation =  1423.400(Ft.)
Downstream point/station elevation =  1413.600(Ft.)
Pipe length  =  1125.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    22.496(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    22.496(CFS)
Normal flow depth in pipe =   21.60(In.)
Flow top width inside pipe =   14.40(In.)
Critical Depth =   20.29(In.)
Pipe flow velocity =      7.56(Ft/s)
Travel time through pipe =    2.48 min.
Time of concentration (TC) =    12.57 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      304.000 to Point/Station      104.000
**** CONFLUENCE OF MAIN STREAMS ****
----------------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 4
Stream flow area =      8.100(Ac.)
Runoff from this stream =     22.496(CFS)
Time of concentration =   12.57 min.
Rainfall intensity =     2.705(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)
```

```
1       11.859     11.41              2.844
2        7.911      9.29              3.166
3        4.092      9.33              3.158
4       22.496     12.57              2.705
Largest stream flow has longer time of concentration
Qp =     22.496 + sum of
          Qb         Ia/Ib
          11.859 *    0.951 =     11.277
          Qb         Ia/Ib
           7.911 *    0.854 =      6.758
          Qb         Ia/Ib
           4.092 *    0.857 =      3.505
Qp =     44.036

Total of 4 main streams to confluence:
Flow rates before confluence point:
      11.859       7.911       4.092      22.496
Area of streams before confluence:
        4.600        2.800        1.300        8.100


Results of confluence:
Total flow rate =     44.036(CFS)
Time of concentration =    12.573 min.
Effective stream area after confluence  =     16.800(Ac.)
End of computations, total study area =           16.80 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number =  75.0
```

100-YEAR OFFSITE HYDROLOGY (RATIONAL METHOD)

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2018 Version 9.0
Rational Hydrology Study Date: 01/19/24 File:PROP100TRUMBLE.out

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22-0198 - ETHANAC LOGISTICS CENTER
OFFSITE RATIONAL METHOD HYDROLOGY
100 YEAR STORM EVENT
FN: PROP100TRUMBLE.OUT RSB

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6584

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Homeland-Winchester] area used.
10 year storm 10 minute intensity = 2.030(In/Hr)
10 year storm 60 minute intensity = 0.800(In/Hr)
100 year storm 10 minute intensity = 3.050(In/Hr)
100 year storm 60 minute intensity = 1.200(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.200(In/Hr)
Slope of intensity duration curve = 0.5200

++

Process from Point/Station 500.000 to Point/Station 501.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 630.000(Ft.)
Top (of initial area) elevation = 1428.900(Ft.)
Bottom (of initial area) elevation = 1426.600(Ft.)
Difference in elevation = 2.300(Ft.)
Slope = 0.00365 s(percent)= 0.37
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 12.145 min.
Rainfall intensity = 2.754(In/Hr) for a 100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.887

```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      2.688(CFS)
Total initial stream area =        1.100(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      501.000 to Point/Station      502.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1424.000(Ft.)
Downstream point/station elevation =  1423.700(Ft.)
Pipe length  =   118.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.688(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     2.688(CFS)
Normal flow depth in pipe =   10.38(In.)
Flow top width inside pipe =   13.85(In.)
Critical Depth =    7.89(In.)
Pipe flow velocity =      2.96(Ft/s)
Travel time through pipe =    0.66 min.
Time of concentration (TC) =    12.81 min.
End of computations, total study area =            1.10 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number =  75.0
```

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2018 Version 9.0
Rational Hydrology Study Date: 01/19/24 File:PROP100OFFSITE.out

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22-0198 - ETHANAC LOGISTICS CENTER
OFFSITE RATIONAL METHOD HYDROLOGY
100 YEAR STORM EVENT
FN: PROP100OFFSITE.OUT RSB

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 6584

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Homeland-Winchester] area used.
10 year storm 10 minute intensity = 2.030(In/Hr)
10 year storm 60 minute intensity = 0.800(In/Hr)
100 year storm 10 minute intensity = 3.050(In/Hr)
100 year storm 60 minute intensity = 1.200(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.200(In/Hr)
Slope of intensity duration curve = 0.5200

++

Process from Point/Station 401.000 to Point/Station 402.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****

Rainfall intensity = 2.025(In/Hr) for a 100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.819
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2) = 75.00
Pervious area fraction = 0.500; Impervious fraction = 0.500
User specified values are as follows:

```
TC =  21.94 min.  Rain intensity =       2.02(In/Hr)
Total area =        27.80(Ac.)  Total runoff =     47.80(CFS)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      402.000 to Point/Station      403.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________________
Top of natural channel elevation =   1431.300(Ft.)
End of natural channel elevation =   1430.200(Ft.)
Length of natural channel  =   258.000(Ft.)
Estimated mean flow rate at midpoint of channel =     48.058(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =   2.50(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
       Normal channel slope =  0.0043
Corrected/adjusted channel slope =  0.0043
Travel time =    1.72 min.     TC =   23.66  min.


 Adding area flow to channel
COMMERCIAL subarea type
Runoff Coefficient = 0.883
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Rainfall intensity =      1.947(In/Hr) for a   100.0 year storm
Subarea runoff =      0.516(CFS) for      0.300(Ac.)
Total runoff =     48.316(CFS)      Total area =      28.100(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      402.000 to Point/Station      403.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     28.100(Ac.)
Runoff from this stream =     48.316(CFS)
Time of concentration =   23.66 min.
Rainfall intensity =     1.947(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      401.100 to Point/Station      403.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****
______________________________________________________________________________
Rainfall intensity =      2.025(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.819
```

```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
User specified values are as follows:
TC =  21.94 min.  Rain intensity =       2.02(In/Hr)
Total area =        11.00(Ac.)  Total runoff =     18.90(CFS)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      401.100 to Point/Station      403.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =     11.000(Ac.)
Runoff from this stream =     18.900(CFS)
Time of concentration =   21.94 min.
Rainfall intensity =     2.025(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       48.316     23.66                1.947
2       18.900     21.94                2.025
Largest stream flow has longer time of concentration
Qp =     48.316 + sum of
          Qb         Ia/Ib
          18.900 *    0.961 =     18.172
Qp =     66.488

Total of 2 streams to confluence:
Flow rates before confluence point:
      48.316      18.900
Area of streams before confluence:
       28.100       11.000
Results of confluence:
Total flow rate =     66.488(CFS)
Time of concentration =    23.661 min.
Effective stream area after confluence =     39.100(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      403.000 to Point/Station      404.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
______________________________________________________________________________
Top of natural channel elevation =   1430.200(Ft.)
End of natural channel elevation =   1429.700(Ft.)
Length of natural channel  =   250.000(Ft.)
Estimated mean flow rate at midpoint of channel =     66.743(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
```

```
Velocity using mean channel flow =   1.88(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
       Normal channel slope =  0.0020
Corrected/adjusted channel slope =  0.0020
Travel time =    2.21 min.     TC =   25.87  min.


 Adding area flow to channel
COMMERCIAL subarea type
Runoff Coefficient = 0.883
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Rainfall intensity =      1.858(In/Hr) for a   100.0 year storm
Subarea runoff =      0.492(CFS) for      0.300(Ac.)
Total runoff =     66.980(CFS)      Total area =      39.400(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      403.000 to Point/Station      404.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     39.400(Ac.)
Runoff from this stream =     66.980(CFS)
Time of concentration =   25.87 min.
Rainfall intensity =     1.858(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      401.200 to Point/Station      404.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****
______________________________________________________________________________
Rainfall intensity =      2.025(In/Hr) for a   100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.819
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
User specified values are as follows:
TC =  21.94 min.  Rain intensity =       2.02(In/Hr)
Total area =        25.80(Ac.)  Total runoff =     44.40(CFS)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      401.200 to Point/Station      404.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
```

```
Stream flow area =     25.800(Ac.)
Runoff from this stream =     44.400(CFS)
Time of concentration =   21.94 min.
Rainfall intensity =     2.025(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       66.980     25.87                1.858
2       44.400     21.94                2.025
Largest stream flow has longer time of concentration
Qp =     66.980 + sum of
          Qb         Ia/Ib
          44.400 *    0.918 =     40.751
Qp =    107.731

Total of 2 streams to confluence:
Flow rates before confluence point:
      66.980      44.400
Area of streams before confluence:
       39.400       25.800
Results of confluence:
Total flow rate =    107.731(CFS)
Time of concentration =    25.874 min.
Effective stream area after confluence =     65.200(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      404.000 to Point/Station      405.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****
________________________________________________________________________
Top of natural channel elevation =   1429.700(Ft.)
End of natural channel elevation =   1427.100(Ft.)
Length of natural channel  =  1227.000(Ft.)
Estimated mean flow rate at midpoint of channel =    109.053(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
 Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =   2.24(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
       Normal channel slope =  0.0021
Corrected/adjusted channel slope =  0.0021
Travel time =    9.12 min.     TC =   34.99  min.


 Adding area flow to channel
COMMERCIAL subarea type
Runoff Coefficient = 0.880
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
```

RI index for soil(AMC 2) = 75.00
Pervious area fraction = 0.100; Impervious fraction = 0.900
Rainfall intensity = 1.588(In/Hr) for a 100.0 year storm
Subarea runoff = 2.237(CFS) for 1.600(Ac.)
Total runoff = 109.968(CFS) Total area = 66.800(Ac.)
End of computations, total study area = 66.80 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.487
Area averaged RI index number = 75.0

RATIONAL METHOD HYDROLOGY MAPS

ILLINOIS AVENUE

TRUMBLE ROAD

SHERMAN ROAD

ETHANAC ROAD

POC LINE "A"
P8-421
INVERT=±1421.8
(NAVD88)

PROP LINE 4

PROP LINE 3

PROP LINE 2

PROP LINE

PROP OFFSITE FLOWS
PUMP, 10 CFS MAX

PROP WQ PUMP
1 CFS MAX

PROP UNDERGROUND CMP
CHAMBERS FOR ONSITE WQ, HCOC,
AND 100-YR, 24-HR FLOWS

NOTE: REVERSE UNDER-SIDEWALK DRAINS ALONG SHERMAN INTERCEPT TOTAL OF 111 CFS OF OFFSITE FLOW FROM EAST OF SHERMAN. SEE NODE 1001 ON OFFSITE UNIT HYDROGRAPH HYDROLOGY EXHIBIT. APPROXIMATE FLOW IS PRORATED PER DRAIN AND NOTED AT CORRESPONDING NODE.

LEGEND

- DRAINAGE MANAGEMENT BOUNDARY
- FLOW DIRECTION
- 101 / 14xx — NODE DESIGNATION / NODE ELEVATION
- *14XX — *INVERT ELEVATION
- 5.0 / 1000' — WATERSHED AREA (ACRES) / LONGEST WATER PATH (FT)

N W WEBB E S

1" = 60'
30 0 60 120 180

CITY OF PERRIS

RATIONAL METHOD ONSITE HYDROLOGY MAP
ETHANAC LOGISTICS CENTER
P22-00030

SCALE:	1"=60'
DATE:	1/19/24
DESIGNED:	RSB
CHECKED:	SKK
PLN CK REF:	
F.B.	

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FAX (951) 788-1256

W.O. 2022-0198
SHEET 1 OF 1 SHEETS
DWG. NO.

H:\2022\22-0198\DRAINAGE\HYD\DWG FOLDER\22-0198-PHYD-RATIONAL.DWG 1/19/2024 10:35:17 AM
KXREFCAB

EXISTING CONDITION UNIT HYDROGRAPHS

EXISTING CONDITION ONSITE 2-YEAR, 24-HOUR UNIT HYDROGRAPH

U n i t H y d r o g r a p h A n a l y s i s

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Study date 12/14/22 File: ONSITEPRE242.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 4010

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

22-0198 - ETHANAC COMMERCE CENTER
ONSITE UNIT HYDROGRAPH ANALYSIS
EXISITNG CONDITION, 2-YEAR 24-HOUR
FN: ONSITEPRE.OUT- RSB

Drainage Area = 19.80(Ac.) = 0.031 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 19.80(Ac.) = 0.031 Sq. Mi.
Length along longest watercourse = 1376.00(Ft.)
Length along longest watercourse measured to centroid = 686.00(Ft.)
Length along longest watercourse = 0.261 Mi.
Length along longest watercourse measured to centroid = 0.130 Mi.
Difference in elevation = 5.00(Ft.)
Slope along watercourse = 19.1860 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.113 Hr.
Lag time = 6.81 Min.
25% of lag time = 1.70 Min.
40% of lag time = 2.72 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

```
Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       19.80            1.60                  31.68

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       19.80            4.00                  79.20

STORM EVENT (YEAR) =    2.00
Area Averaged 2-Year Rainfall =    1.600(In)
Area Averaged 100-Year Rainfall =    4.000(In)

Point rain (area averaged) =    1.600(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    1.600(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    19.800           89.00         0.000
 Total Area Entered =     19.80(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-1     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
89.0  76.4      0.286     0.000        0.286       1.000      0.286
                                                 Sum (F) =   0.286
Area averaged mean soil loss (F) (In/Hr) =  0.286
Minimum soil loss rate ((In/Hr)) =  0.143
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
------------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                       VALLEY S-Curve
------------------------------------------------------------------------
               Unit Hydrograph Data
------------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                          Graph %            (CFS)
------------------------------------------------------------------------
    1   0.083         73.448         11.521              2.299
    2   0.167        146.895         41.791              8.339
    3   0.250        220.343         21.981              4.386
    4   0.333        293.790          8.716              1.739
    5   0.417        367.238          5.287              1.055
    6   0.500        440.685          3.444              0.687
    7   0.583        514.133          2.371              0.473
    8   0.667        587.580          1.770              0.353
```

9	0.750	661.028	1.252	0.250
10	0.833	734.475	0.845	0.169
11	0.917	807.923	1.022	0.204
			Sum = 100.000	Sum= 19.955

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.013	(0.508)	0.012	0.001
2	0.17	0.07	0.013	(0.506)	0.012	0.001
3	0.25	0.07	0.013	(0.504)	0.012	0.001
4	0.33	0.10	0.019	(0.502)	0.017	0.002
5	0.42	0.10	0.019	(0.500)	0.017	0.002
6	0.50	0.10	0.019	(0.498)	0.017	0.002
7	0.58	0.10	0.019	(0.496)	0.017	0.002
8	0.67	0.10	0.019	(0.494)	0.017	0.002
9	0.75	0.10	0.019	(0.492)	0.017	0.002
10	0.83	0.13	0.026	(0.490)	0.023	0.003
11	0.92	0.13	0.026	(0.488)	0.023	0.003
12	1.00	0.13	0.026	(0.486)	0.023	0.003
13	1.08	0.10	0.019	(0.485)	0.017	0.002
14	1.17	0.10	0.019	(0.483)	0.017	0.002
15	1.25	0.10	0.019	(0.481)	0.017	0.002
16	1.33	0.10	0.019	(0.479)	0.017	0.002
17	1.42	0.10	0.019	(0.477)	0.017	0.002
18	1.50	0.10	0.019	(0.475)	0.017	0.002
19	1.58	0.10	0.019	(0.473)	0.017	0.002
20	1.67	0.10	0.019	(0.471)	0.017	0.002
21	1.75	0.10	0.019	(0.469)	0.017	0.002
22	1.83	0.13	0.026	(0.467)	0.023	0.003
23	1.92	0.13	0.026	(0.466)	0.023	0.003
24	2.00	0.13	0.026	(0.464)	0.023	0.003
25	2.08	0.13	0.026	(0.462)	0.023	0.003
26	2.17	0.13	0.026	(0.460)	0.023	0.003
27	2.25	0.13	0.026	(0.458)	0.023	0.003
28	2.33	0.13	0.026	(0.456)	0.023	0.003
29	2.42	0.13	0.026	(0.454)	0.023	0.003
30	2.50	0.13	0.026	(0.452)	0.023	0.003
31	2.58	0.17	0.032	(0.451)	0.029	0.003
32	2.67	0.17	0.032	(0.449)	0.029	0.003
33	2.75	0.17	0.032	(0.447)	0.029	0.003
34	2.83	0.17	0.032	(0.445)	0.029	0.003
35	2.92	0.17	0.032	(0.443)	0.029	0.003
36	3.00	0.17	0.032	(0.441)	0.029	0.003
37	3.08	0.17	0.032	(0.440)	0.029	0.003
38	3.17	0.17	0.032	(0.438)	0.029	0.003

39	3.25	0.17	0.032	(0.436)	0.029	0.003
40	3.33	0.17	0.032	(0.434)	0.029	0.003
41	3.42	0.17	0.032	(0.432)	0.029	0.003
42	3.50	0.17	0.032	(0.430)	0.029	0.003
43	3.58	0.17	0.032	(0.429)	0.029	0.003
44	3.67	0.17	0.032	(0.427)	0.029	0.003
45	3.75	0.17	0.032	(0.425)	0.029	0.003
46	3.83	0.20	0.038	(0.423)	0.035	0.004
47	3.92	0.20	0.038	(0.422)	0.035	0.004
48	4.00	0.20	0.038	(0.420)	0.035	0.004
49	4.08	0.20	0.038	(0.418)	0.035	0.004
50	4.17	0.20	0.038	(0.416)	0.035	0.004
51	4.25	0.20	0.038	(0.414)	0.035	0.004
52	4.33	0.23	0.045	(0.413)	0.040	0.004
53	4.42	0.23	0.045	(0.411)	0.040	0.004
54	4.50	0.23	0.045	(0.409)	0.040	0.004
55	4.58	0.23	0.045	(0.407)	0.040	0.004
56	4.67	0.23	0.045	(0.406)	0.040	0.004
57	4.75	0.23	0.045	(0.404)	0.040	0.004
58	4.83	0.27	0.051	(0.402)	0.046	0.005
59	4.92	0.27	0.051	(0.400)	0.046	0.005
60	5.00	0.27	0.051	(0.399)	0.046	0.005
61	5.08	0.20	0.038	(0.397)	0.035	0.004
62	5.17	0.20	0.038	(0.395)	0.035	0.004
63	5.25	0.20	0.038	(0.393)	0.035	0.004
64	5.33	0.23	0.045	(0.392)	0.040	0.004
65	5.42	0.23	0.045	(0.390)	0.040	0.004
66	5.50	0.23	0.045	(0.388)	0.040	0.004
67	5.58	0.27	0.051	(0.387)	0.046	0.005
68	5.67	0.27	0.051	(0.385)	0.046	0.005
69	5.75	0.27	0.051	(0.383)	0.046	0.005
70	5.83	0.27	0.051	(0.382)	0.046	0.005
71	5.92	0.27	0.051	(0.380)	0.046	0.005
72	6.00	0.27	0.051	(0.378)	0.046	0.005
73	6.08	0.30	0.058	(0.376)	0.052	0.006
74	6.17	0.30	0.058	(0.375)	0.052	0.006
75	6.25	0.30	0.058	(0.373)	0.052	0.006
76	6.33	0.30	0.058	(0.371)	0.052	0.006
77	6.42	0.30	0.058	(0.370)	0.052	0.006
78	6.50	0.30	0.058	(0.368)	0.052	0.006
79	6.58	0.33	0.064	(0.366)	0.058	0.006
80	6.67	0.33	0.064	(0.365)	0.058	0.006
81	6.75	0.33	0.064	(0.363)	0.058	0.006
82	6.83	0.33	0.064	(0.362)	0.058	0.006
83	6.92	0.33	0.064	(0.360)	0.058	0.006
84	7.00	0.33	0.064	(0.358)	0.058	0.006
85	7.08	0.33	0.064	(0.357)	0.058	0.006
86	7.17	0.33	0.064	(0.355)	0.058	0.006
87	7.25	0.33	0.064	(0.353)	0.058	0.006
88	7.33	0.37	0.070	(0.352)	0.063	0.007

89	7.42	0.37	0.070	(0.350)	0.063	0.007
90	7.50	0.37	0.070	(0.349)	0.063	0.007
91	7.58	0.40	0.077	(0.347)	0.069	0.008
92	7.67	0.40	0.077	(0.345)	0.069	0.008
93	7.75	0.40	0.077	(0.344)	0.069	0.008
94	7.83	0.43	0.083	(0.342)	0.075	0.008
95	7.92	0.43	0.083	(0.341)	0.075	0.008
96	8.00	0.43	0.083	(0.339)	0.075	0.008
97	8.08	0.50	0.096	(0.337)	0.086	0.010
98	8.17	0.50	0.096	(0.336)	0.086	0.010
99	8.25	0.50	0.096	(0.334)	0.086	0.010
100	8.33	0.50	0.096	(0.333)	0.086	0.010
101	8.42	0.50	0.096	(0.331)	0.086	0.010
102	8.50	0.50	0.096	(0.330)	0.086	0.010
103	8.58	0.53	0.102	(0.328)	0.092	0.010
104	8.67	0.53	0.102	(0.327)	0.092	0.010
105	8.75	0.53	0.102	(0.325)	0.092	0.010
106	8.83	0.57	0.109	(0.323)	0.098	0.011
107	8.92	0.57	0.109	(0.322)	0.098	0.011
108	9.00	0.57	0.109	(0.320)	0.098	0.011
109	9.08	0.63	0.122	(0.319)	0.109	0.012
110	9.17	0.63	0.122	(0.317)	0.109	0.012
111	9.25	0.63	0.122	(0.316)	0.109	0.012
112	9.33	0.67	0.128	(0.314)	0.115	0.013
113	9.42	0.67	0.128	(0.313)	0.115	0.013
114	9.50	0.67	0.128	(0.311)	0.115	0.013
115	9.58	0.70	0.134	(0.310)	0.121	0.013
116	9.67	0.70	0.134	(0.308)	0.121	0.013
117	9.75	0.70	0.134	(0.307)	0.121	0.013
118	9.83	0.73	0.141	(0.305)	0.127	0.014
119	9.92	0.73	0.141	(0.304)	0.127	0.014
120	10.00	0.73	0.141	(0.303)	0.127	0.014
121	10.08	0.50	0.096	(0.301)	0.086	0.010
122	10.17	0.50	0.096	(0.300)	0.086	0.010
123	10.25	0.50	0.096	(0.298)	0.086	0.010
124	10.33	0.50	0.096	(0.297)	0.086	0.010
125	10.42	0.50	0.096	(0.295)	0.086	0.010
126	10.50	0.50	0.096	(0.294)	0.086	0.010
127	10.58	0.67	0.128	(0.292)	0.115	0.013
128	10.67	0.67	0.128	(0.291)	0.115	0.013
129	10.75	0.67	0.128	(0.290)	0.115	0.013
130	10.83	0.67	0.128	(0.288)	0.115	0.013
131	10.92	0.67	0.128	(0.287)	0.115	0.013
132	11.00	0.67	0.128	(0.285)	0.115	0.013
133	11.08	0.63	0.122	(0.284)	0.109	0.012
134	11.17	0.63	0.122	(0.282)	0.109	0.012
135	11.25	0.63	0.122	(0.281)	0.109	0.012
136	11.33	0.63	0.122	(0.280)	0.109	0.012
137	11.42	0.63	0.122	(0.278)	0.109	0.012
138	11.50	0.63	0.122	(0.277)	0.109	0.012

139	11.58	0.57	0.109	(0.276)	0.098	0.011
140	11.67	0.57	0.109	(0.274)	0.098	0.011
141	11.75	0.57	0.109	(0.273)	0.098	0.011
142	11.83	0.60	0.115	(0.271)	0.104	0.012
143	11.92	0.60	0.115	(0.270)	0.104	0.012
144	12.00	0.60	0.115	(0.269)	0.104	0.012
145	12.08	0.83	0.160	(0.267)	0.144	0.016
146	12.17	0.83	0.160	(0.266)	0.144	0.016
147	12.25	0.83	0.160	(0.265)	0.144	0.016
148	12.33	0.87	0.166	(0.263)	0.150	0.017
149	12.42	0.87	0.166	(0.262)	0.150	0.017
150	12.50	0.87	0.166	(0.261)	0.150	0.017
151	12.58	0.93	0.179	(0.259)	0.161	0.018
152	12.67	0.93	0.179	(0.258)	0.161	0.018
153	12.75	0.93	0.179	(0.257)	0.161	0.018
154	12.83	0.97	0.186	(0.256)	0.167	0.019
155	12.92	0.97	0.186	(0.254)	0.167	0.019
156	13.00	0.97	0.186	(0.253)	0.167	0.019
157	13.08	1.13	0.218	(0.252)	0.196	0.022
158	13.17	1.13	0.218	(0.250)	0.196	0.022
159	13.25	1.13	0.218	(0.249)	0.196	0.022
160	13.33	1.13	0.218	(0.248)	0.196	0.022
161	13.42	1.13	0.218	(0.247)	0.196	0.022
162	13.50	1.13	0.218	(0.245)	0.196	0.022
163	13.58	0.77	0.147	(0.244)	0.132	0.015
164	13.67	0.77	0.147	(0.243)	0.132	0.015
165	13.75	0.77	0.147	(0.242)	0.132	0.015
166	13.83	0.77	0.147	(0.240)	0.132	0.015
167	13.92	0.77	0.147	(0.239)	0.132	0.015
168	14.00	0.77	0.147	(0.238)	0.132	0.015
169	14.08	0.90	0.173	(0.237)	0.156	0.017
170	14.17	0.90	0.173	(0.236)	0.156	0.017
171	14.25	0.90	0.173	(0.234)	0.156	0.017
172	14.33	0.87	0.166	(0.233)	0.150	0.017
173	14.42	0.87	0.166	(0.232)	0.150	0.017
174	14.50	0.87	0.166	(0.231)	0.150	0.017
175	14.58	0.87	0.166	(0.230)	0.150	0.017
176	14.67	0.87	0.166	(0.228)	0.150	0.017
177	14.75	0.87	0.166	(0.227)	0.150	0.017
178	14.83	0.83	0.160	(0.226)	0.144	0.016
179	14.92	0.83	0.160	(0.225)	0.144	0.016
180	15.00	0.83	0.160	(0.224)	0.144	0.016
181	15.08	0.80	0.154	(0.223)	0.138	0.015
182	15.17	0.80	0.154	(0.221)	0.138	0.015
183	15.25	0.80	0.154	(0.220)	0.138	0.015
184	15.33	0.77	0.147	(0.219)	0.132	0.015
185	15.42	0.77	0.147	(0.218)	0.132	0.015
186	15.50	0.77	0.147	(0.217)	0.132	0.015
187	15.58	0.63	0.122	(0.216)	0.109	0.012
188	15.67	0.63	0.122	(0.215)	0.109	0.012

189	15.75	0.63	0.122	(0.214)	0.109	0.012
190	15.83	0.63	0.122	(0.213)	0.109	0.012
191	15.92	0.63	0.122	(0.211)	0.109	0.012
192	16.00	0.63	0.122	(0.210)	0.109	0.012
193	16.08	0.13	0.026	(0.209)	0.023	0.003
194	16.17	0.13	0.026	(0.208)	0.023	0.003
195	16.25	0.13	0.026	(0.207)	0.023	0.003
196	16.33	0.13	0.026	(0.206)	0.023	0.003
197	16.42	0.13	0.026	(0.205)	0.023	0.003
198	16.50	0.13	0.026	(0.204)	0.023	0.003
199	16.58	0.10	0.019	(0.203)	0.017	0.002
200	16.67	0.10	0.019	(0.202)	0.017	0.002
201	16.75	0.10	0.019	(0.201)	0.017	0.002
202	16.83	0.10	0.019	(0.200)	0.017	0.002
203	16.92	0.10	0.019	(0.199)	0.017	0.002
204	17.00	0.10	0.019	(0.198)	0.017	0.002
205	17.08	0.17	0.032	(0.197)	0.029	0.003
206	17.17	0.17	0.032	(0.196)	0.029	0.003
207	17.25	0.17	0.032	(0.195)	0.029	0.003
208	17.33	0.17	0.032	(0.194)	0.029	0.003
209	17.42	0.17	0.032	(0.193)	0.029	0.003
210	17.50	0.17	0.032	(0.192)	0.029	0.003
211	17.58	0.17	0.032	(0.191)	0.029	0.003
212	17.67	0.17	0.032	(0.190)	0.029	0.003
213	17.75	0.17	0.032	(0.189)	0.029	0.003
214	17.83	0.13	0.026	(0.188)	0.023	0.003
215	17.92	0.13	0.026	(0.187)	0.023	0.003
216	18.00	0.13	0.026	(0.186)	0.023	0.003
217	18.08	0.13	0.026	(0.185)	0.023	0.003
218	18.17	0.13	0.026	(0.185)	0.023	0.003
219	18.25	0.13	0.026	(0.184)	0.023	0.003
220	18.33	0.13	0.026	(0.183)	0.023	0.003
221	18.42	0.13	0.026	(0.182)	0.023	0.003
222	18.50	0.13	0.026	(0.181)	0.023	0.003
223	18.58	0.10	0.019	(0.180)	0.017	0.002
224	18.67	0.10	0.019	(0.179)	0.017	0.002
225	18.75	0.10	0.019	(0.178)	0.017	0.002
226	18.83	0.07	0.013	(0.177)	0.012	0.001
227	18.92	0.07	0.013	(0.177)	0.012	0.001
228	19.00	0.07	0.013	(0.176)	0.012	0.001
229	19.08	0.10	0.019	(0.175)	0.017	0.002
230	19.17	0.10	0.019	(0.174)	0.017	0.002
231	19.25	0.10	0.019	(0.173)	0.017	0.002
232	19.33	0.13	0.026	(0.173)	0.023	0.003
233	19.42	0.13	0.026	(0.172)	0.023	0.003
234	19.50	0.13	0.026	(0.171)	0.023	0.003
235	19.58	0.10	0.019	(0.170)	0.017	0.002
236	19.67	0.10	0.019	(0.169)	0.017	0.002
237	19.75	0.10	0.019	(0.169)	0.017	0.002
238	19.83	0.07	0.013	(0.168)	0.012	0.001

239	19.92	0.07	0.013	(0.167)	0.012	0.001
240	20.00	0.07	0.013	(0.166)	0.012	0.001
241	20.08	0.10	0.019	(0.166)	0.017	0.002
242	20.17	0.10	0.019	(0.165)	0.017	0.002
243	20.25	0.10	0.019	(0.164)	0.017	0.002
244	20.33	0.10	0.019	(0.163)	0.017	0.002
245	20.42	0.10	0.019	(0.163)	0.017	0.002
246	20.50	0.10	0.019	(0.162)	0.017	0.002
247	20.58	0.10	0.019	(0.161)	0.017	0.002
248	20.67	0.10	0.019	(0.161)	0.017	0.002
249	20.75	0.10	0.019	(0.160)	0.017	0.002
250	20.83	0.07	0.013	(0.159)	0.012	0.001
251	20.92	0.07	0.013	(0.159)	0.012	0.001
252	21.00	0.07	0.013	(0.158)	0.012	0.001
253	21.08	0.10	0.019	(0.157)	0.017	0.002
254	21.17	0.10	0.019	(0.157)	0.017	0.002
255	21.25	0.10	0.019	(0.156)	0.017	0.002
256	21.33	0.07	0.013	(0.156)	0.012	0.001
257	21.42	0.07	0.013	(0.155)	0.012	0.001
258	21.50	0.07	0.013	(0.155)	0.012	0.001
259	21.58	0.10	0.019	(0.154)	0.017	0.002
260	21.67	0.10	0.019	(0.153)	0.017	0.002
261	21.75	0.10	0.019	(0.153)	0.017	0.002
262	21.83	0.07	0.013	(0.152)	0.012	0.001
263	21.92	0.07	0.013	(0.152)	0.012	0.001
264	22.00	0.07	0.013	(0.151)	0.012	0.001
265	22.08	0.10	0.019	(0.151)	0.017	0.002
266	22.17	0.10	0.019	(0.150)	0.017	0.002
267	22.25	0.10	0.019	(0.150)	0.017	0.002
268	22.33	0.07	0.013	(0.149)	0.012	0.001
269	22.42	0.07	0.013	(0.149)	0.012	0.001
270	22.50	0.07	0.013	(0.148)	0.012	0.001
271	22.58	0.07	0.013	(0.148)	0.012	0.001
272	22.67	0.07	0.013	(0.148)	0.012	0.001
273	22.75	0.07	0.013	(0.147)	0.012	0.001
274	22.83	0.07	0.013	(0.147)	0.012	0.001
275	22.92	0.07	0.013	(0.146)	0.012	0.001
276	23.00	0.07	0.013	(0.146)	0.012	0.001
277	23.08	0.07	0.013	(0.146)	0.012	0.001
278	23.17	0.07	0.013	(0.145)	0.012	0.001
279	23.25	0.07	0.013	(0.145)	0.012	0.001
280	23.33	0.07	0.013	(0.145)	0.012	0.001
281	23.42	0.07	0.013	(0.145)	0.012	0.001
282	23.50	0.07	0.013	(0.144)	0.012	0.001
283	23.58	0.07	0.013	(0.144)	0.012	0.001
284	23.67	0.07	0.013	(0.144)	0.012	0.001
285	23.75	0.07	0.013	(0.144)	0.012	0.001
286	23.83	0.07	0.013	(0.143)	0.012	0.001
287	23.92	0.07	0.013	(0.143)	0.012	0.001
288	24.00	0.07	0.013	(0.143)	0.012	0.001

(Loss Rate Not Used)
Sum = 100.0 Sum = 1.9
Flood volume = Effective rainfall 0.16(In)
times area 19.8(Ac.)/[(In)/(Ft.)] = 0.3(Ac.Ft)
Total soil loss = 1.44(In)
Total soil loss = 2.376(Ac.Ft)
Total rainfall = 1.60(In)
Flood volume = 11499.4 Cubic Feet
Total soil loss = 103494.6 Cubic Feet

Peak flow rate of this hydrograph = 0.430(CFS)

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24 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0000	0.00	Q				
0+10	0.0001	0.01	Q				
0+15	0.0002	0.02	Q				
0+20	0.0004	0.02	Q				
0+25	0.0006	0.03	Q				
0+30	0.0008	0.03	Q				
0+35	0.0011	0.04	Q				
0+40	0.0013	0.04	Q				
0+45	0.0016	0.04	Q				
0+50	0.0019	0.04	Q				
0+55	0.0022	0.04	Q				
1+ 0	0.0025	0.05	Q				
1+ 5	0.0028	0.05	Q				
1+10	0.0031	0.04	Q				
1+15	0.0034	0.04	Q				
1+20	0.0037	0.04	Q				
1+25	0.0039	0.04	Q				
1+30	0.0042	0.04	Q				
1+35	0.0045	0.04	Q				
1+40	0.0047	0.04	Q				
1+45	0.0050	0.04	Q				
1+50	0.0053	0.04	Q				
1+55	0.0056	0.05	Q				
2+ 0	0.0059	0.05	Q				
2+ 5	0.0063	0.05	Q				
2+10	0.0066	0.05	Q				
2+15	0.0069	0.05	QV				
2+20	0.0073	0.05	QV				
2+25	0.0076	0.05	QV				

2+30	0.0080	0.05	QV	|	|	|	|
2+35	0.0084	0.05	QV	|	|	|	|
2+40	0.0088	0.06	QV	|	|	|	|
2+45	0.0092	0.06	QV	|	|	|	|
2+50	0.0096	0.06	QV	|	|	|	|
2+55	0.0100	0.06	QV	|	|	|	|
3+ 0	0.0105	0.06	QV	|	|	|	|
3+ 5	0.0109	0.06	QV	|	|	|	|
3+10	0.0113	0.06	QV	|	|	|	|
3+15	0.0118	0.06	QV	|	|	|	|
3+20	0.0122	0.06	QV	|	|	|	|
3+25	0.0127	0.06	QV	|	|	|	|
3+30	0.0131	0.06	QV	|	|	|	|
3+35	0.0135	0.06	Q V	|	|	|	|
3+40	0.0140	0.06	Q V	|	|	|	|
3+45	0.0144	0.06	Q V	|	|	|	|
3+50	0.0149	0.07	Q V	|	|	|	|
3+55	0.0153	0.07	Q V	|	|	|	|
4+ 0	0.0159	0.07	Q V	|	|	|	|
4+ 5	0.0164	0.07	Q V	|	|	|	|
4+10	0.0169	0.08	Q V	|	|	|	|
4+15	0.0174	0.08	Q V	|	|	|	|
4+20	0.0179	0.08	Q V	|	|	|	|
4+25	0.0185	0.08	Q V	|	|	|	|
4+30	0.0191	0.09	Q V	|	|	|	|
4+35	0.0197	0.09	Q V	|	|	|	|
4+40	0.0203	0.09	Q V	|	|	|	|
4+45	0.0209	0.09	Q V	|	|	|	|
4+50	0.0215	0.09	Q V	|	|	|	|
4+55	0.0222	0.10	Q V	|	|	|	|
5+ 0	0.0229	0.10	Q V	|	|	|	|
5+ 5	0.0236	0.10	Q V	|	|	|	|
5+10	0.0242	0.09	Q V	|	|	|	|
5+15	0.0247	0.08	Q V	|	|	|	|
5+20	0.0253	0.08	Q V	|	|	|	|
5+25	0.0259	0.09	Q V	|	|	|	|
5+30	0.0265	0.09	Q V	|	|	|	|
5+35	0.0271	0.09	Q V	|	|	|	|
5+40	0.0278	0.10	Q V	|	|	|	|
5+45	0.0284	0.10	Q V	|	|	|	|
5+50	0.0291	0.10	Q V	|	|	|	|
5+55	0.0298	0.10	Q V	|	|	|	|
6+ 0	0.0305	0.10	Q V	|	|	|	|
6+ 5	0.0312	0.10	Q V	|	|	|	|
6+10	0.0320	0.11	Q V	|	|	|	|
6+15	0.0327	0.11	Q V	|	|	|	|
6+20	0.0335	0.11	Q V	|	|	|	|
6+25	0.0343	0.11	Q V	|	|	|	|
6+30	0.0351	0.11	Q V	|	|	|	|
6+35	0.0359	0.12	Q V	|	|	|	|

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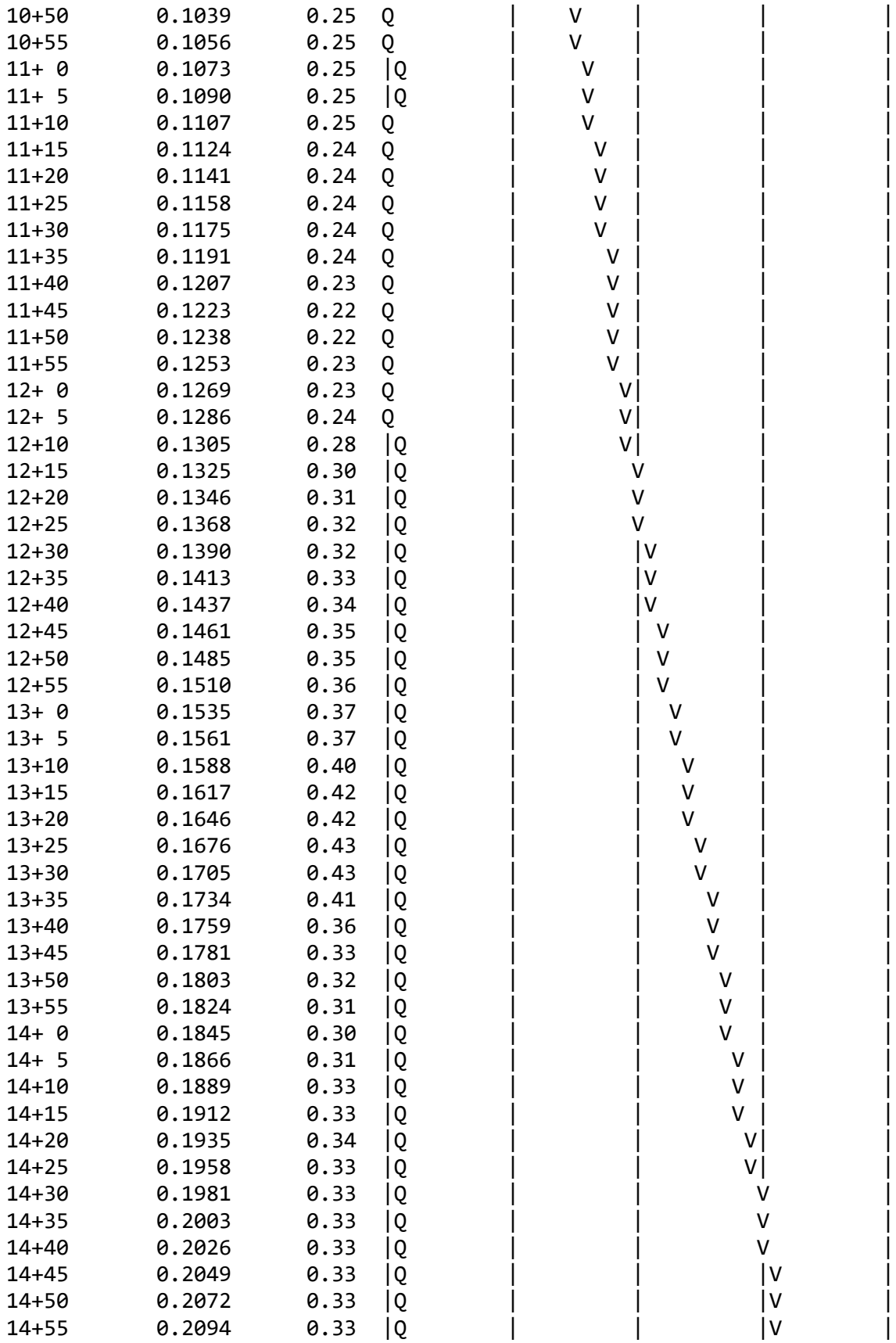
 6+40       0.0367      0.12  Q    V    |          |          |          |
 6+45       0.0376      0.12  Q    V    |          |          |          |
 6+50       0.0384      0.13  Q    V    |          |          |          |
 6+55       0.0393      0.13  Q    V    |          |          |          |
 7+ 0       0.0402      0.13  Q     V   |          |          |          |
 7+ 5       0.0411      0.13  Q     V   |          |          |          |
 7+10       0.0419      0.13  Q     V   |          |          |          |
 7+15       0.0428      0.13  Q     V   |          |          |          |
 7+20       0.0437      0.13  Q     V   |          |          |          |
 7+25       0.0446      0.13  Q     V   |          |          |          |
 7+30       0.0456      0.14  Q     V   |          |          |          |
 7+35       0.0465      0.14  Q      V  |          |          |          |
 7+40       0.0475      0.15  Q      V  |          |          |          |
 7+45       0.0486      0.15  Q      V  |          |          |          |
 7+50       0.0496      0.15  Q      V  |          |          |          |
 7+55       0.0507      0.16  Q      V  |          |          |          |
 8+ 0       0.0518      0.16  Q      V  |          |          |          |
 8+ 5       0.0530      0.17  Q       V |          |          |          |
 8+10       0.0542      0.18  Q       V |          |          |          |
 8+15       0.0555      0.18  Q       V |          |          |          |
 8+20       0.0568      0.19  Q       V |          |          |          |
 8+25       0.0580      0.19  Q       V |          |          |          |
 8+30       0.0594      0.19  Q       V |          |          |          |
 8+35       0.0607      0.19  Q        V|          |          |          |
 8+40       0.0620      0.20  Q        V|          |          |          |
 8+45       0.0634      0.20  Q        V|          |          |          |
 8+50       0.0648      0.20  Q        V|          |          |          |
 8+55       0.0663      0.21  Q         V          |          |          |
 9+ 0       0.0677      0.21  Q         V          |          |          |
 9+ 5       0.0692      0.22  Q         V          |          |          |
 9+10       0.0708      0.23  Q         V          |          |          |
 9+15       0.0724      0.24  Q         V          |          |          |
 9+20       0.0741      0.24  Q         |V         |          |          |
 9+25       0.0758      0.25  Q         |V         |          |          |
 9+30       0.0775      0.25  |Q        |V         |          |          |
 9+35       0.0792      0.25  |Q        | V        |          |          |
 9+40       0.0810      0.26  |Q        | V        |          |          |
 9+45       0.0829      0.26  |Q        | V        |          |          |
 9+50       0.0847      0.27  |Q        | V        |          |          |
 9+55       0.0866      0.27  |Q        |  V       |          |          |
10+ 0       0.0885      0.28  |Q        |  V       |          |          |
10+ 5       0.0903      0.27  |Q        |  V       |          |          |
10+10       0.0919      0.23  Q         |  V       |          |          |
10+15       0.0934      0.21  Q         |   V      |          |          |
10+20       0.0948      0.21  Q         |   V      |          |          |
10+25       0.0962      0.20  Q         |   V      |          |          |
10+30       0.0975      0.20  Q         |   V      |          |          |
10+35       0.0989      0.20  Q         |   V      |          |          |
10+40       0.1005      0.23  Q         |    V     |          |          |
10+45       0.1022      0.24  Q         |    V     |          |          |
```


10+50 0.1039 0.25
10+55 0.1056 0.25
11+ 0 0.1073 0.25
11+ 5 0.1090 0.25
11+10 0.1107 0.25
11+15 0.1124 0.24
11+20 0.1141 0.24
11+25 0.1158 0.24
11+30 0.1175 0.24
11+35 0.1191 0.24
11+40 0.1207 0.23
11+45 0.1223 0.22
11+50 0.1238 0.22
11+55 0.1253 0.23
12+ 0 0.1269 0.23
12+ 5 0.1286 0.24
12+10 0.1305 0.28
12+15 0.1325 0.30
12+20 0.1346 0.31
12+25 0.1368 0.32
12+30 0.1390 0.32
12+35 0.1413 0.33
12+40 0.1437 0.34
12+45 0.1461 0.35
12+50 0.1485 0.35
12+55 0.1510 0.36
13+ 0 0.1535 0.37
13+ 5 0.1561 0.37
13+10 0.1588 0.40
13+15 0.1617 0.42
13+20 0.1646 0.42
13+25 0.1676 0.43
13+30 0.1705 0.43
13+35 0.1734 0.41
13+40 0.1759 0.36
13+45 0.1781 0.33
13+50 0.1803 0.32
13+55 0.1824 0.31
14+ 0 0.1845 0.30
14+ 5 0.1866 0.31
14+10 0.1889 0.33
14+15 0.1912 0.33
14+20 0.1935 0.34
14+25 0.1958 0.33
14+30 0.1981 0.33
14+35 0.2003 0.33
14+40 0.2026 0.33
14+45 0.2049 0.33
14+50 0.2072 0.33
14+55 0.2094 0.33

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15+ 0       0.2117      0.32  |Q        |         |         | V       |
15+ 5       0.2139      0.32  |Q        |         |         | V       |
15+10       0.2160      0.31  |Q        |         |         | V       |
15+15       0.2182      0.31  |Q        |         |         |  V      |
15+20       0.2203      0.31  |Q        |         |         |  V      |
15+25       0.2224      0.30  |Q        |         |         |  V      |
15+30       0.2244      0.30  |Q        |         |         |   V     |
15+35       0.2264      0.29  |Q        |         |         |   V     |
15+40       0.2283      0.27  |Q        |         |         |   V     |
15+45       0.2300      0.26  |Q        |         |         |   V     |
15+50       0.2318      0.25  |Q        |         |         |    V    |
15+55       0.2335      0.25  Q         |         |         |    V    |
16+ 0       0.2352      0.25  Q         |         |         |    V    |
16+ 5       0.2367      0.22  Q         |         |         |    V    |
16+10       0.2377      0.14  Q         |         |         |     V   |
16+15       0.2384      0.10  Q         |         |         |     V   |
16+20       0.2390      0.08  Q         |         |         |     V   |
16+25       0.2394      0.07  Q         |         |         |     V   |
16+30       0.2399      0.07  Q         |         |         |     V   |
16+35       0.2403      0.06  Q         |         |         |     V   |
16+40       0.2406      0.05  Q         |         |         |     V   |
16+45       0.2410      0.05  Q         |         |         |     V   |
16+50       0.2412      0.04  Q         |         |         |     V   |
16+55       0.2415      0.04  Q         |         |         |     V   |
17+ 0       0.2418      0.04  Q         |         |         |     V   |
17+ 5       0.2421      0.04  Q         |         |         |     V   |
17+10       0.2424      0.05  Q         |         |         |     V   |
17+15       0.2428      0.06  Q         |         |         |     V   |
17+20       0.2433      0.06  Q         |         |         |     V   |
17+25       0.2437      0.06  Q         |         |         |     V   |
17+30       0.2441      0.06  Q         |         |         |     V   |
17+35       0.2445      0.06  Q         |         |         |      V  |
17+40       0.2450      0.06  Q         |         |         |      V  |
17+45       0.2454      0.06  Q         |         |         |      V  |
17+50       0.2458      0.06  Q         |         |         |      V  |
17+55       0.2462      0.06  Q         |         |         |      V  |
18+ 0       0.2466      0.05  Q         |         |         |      V  |
18+ 5       0.2470      0.05  Q         |         |         |      V  |
18+10       0.2473      0.05  Q         |         |         |      V  |
18+15       0.2477      0.05  Q         |         |         |      V  |
18+20       0.2480      0.05  Q         |         |         |      V  |
18+25       0.2484      0.05  Q         |         |         |      V  |
18+30       0.2487      0.05  Q         |         |         |      V  |
18+35       0.2491      0.05  Q         |         |         |      V  |
18+40       0.2494      0.04  Q         |         |         |      V  |
18+45       0.2497      0.04  Q         |         |         |      V  |
18+50       0.2500      0.04  Q         |         |         |      V  |
18+55       0.2502      0.03  Q         |         |         |      V  |
19+ 0       0.2504      0.03  Q         |         |         |      V  |
19+ 5       0.2506      0.03  Q         |         |         |      V  |
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19+10	0.2508	0.03	Q	|	|	|	V |
19+15	0.2511	0.04	Q	|	|	|	V |
19+20	0.2513	0.04	Q	|	|	|	V |
19+25	0.2516	0.04	Q	|	|	|	V |
19+30	0.2520	0.05	Q	|	|	|	V |
19+35	0.2523	0.05	Q	|	|	|	V |
19+40	0.2526	0.04	Q	|	|	|	V |
19+45	0.2529	0.04	Q	|	|	|	V |
19+50	0.2531	0.04	Q	|	|	|	V |
19+55	0.2533	0.03	Q	|	|	|	V |
20+ 0	0.2535	0.03	Q	|	|	|	V |
20+ 5	0.2538	0.03	Q	|	|	|	V |
20+10	0.2540	0.03	Q	|	|	|	V |
20+15	0.2542	0.04	Q	|	|	|	V |
20+20	0.2545	0.04	Q	|	|	|	V |
20+25	0.2548	0.04	Q	|	|	|	V |
20+30	0.2550	0.04	Q	|	|	|	V |
20+35	0.2553	0.04	Q	|	|	|	V |
20+40	0.2555	0.04	Q	|	|	|	V |
20+45	0.2558	0.04	Q	|	|	|	V |
20+50	0.2560	0.04	Q	|	|	|	V |
20+55	0.2563	0.03	Q	|	|	|	V |
21+ 0	0.2565	0.03	Q	|	|	|	V |
21+ 5	0.2567	0.03	Q	|	|	|	V |
21+10	0.2569	0.03	Q	|	|	|	V |
21+15	0.2571	0.04	Q	|	|	|	V |
21+20	0.2574	0.04	Q	|	|	|	V |
21+25	0.2576	0.03	Q	|	|	|	V|
21+30	0.2578	0.03	Q	|	|	|	V|
21+35	0.2580	0.03	Q	|	|	|	V|
21+40	0.2582	0.03	Q	|	|	|	V|
21+45	0.2585	0.04	Q	|	|	|	V|
21+50	0.2587	0.04	Q	|	|	|	V|
21+55	0.2589	0.03	Q	|	|	|	V|
22+ 0	0.2591	0.03	Q	|	|	|	V|
22+ 5	0.2593	0.03	Q	|	|	|	V|
22+10	0.2595	0.03	Q	|	|	|	V|
22+15	0.2598	0.04	Q	|	|	|	V|
22+20	0.2600	0.04	Q	|	|	|	V|
22+25	0.2602	0.03	Q	|	|	|	V|
22+30	0.2604	0.03	Q	|	|	|	V|
22+35	0.2606	0.03	Q	|	|	|	V|
22+40	0.2608	0.03	Q	|	|	|	V|
22+45	0.2610	0.03	Q	|	|	|	V|
22+50	0.2612	0.03	Q	|	|	|	V|
22+55	0.2613	0.03	Q	|	|	|	V|
23+ 0	0.2615	0.03	Q	|	|	|	V|
23+ 5	0.2617	0.03	Q	|	|	|	V|
23+10	0.2619	0.03	Q	|	|	|	V|
23+15	0.2620	0.03	Q	|	|	|	V|

```
   23+20       0.2622      0.03  Q          |          |          |         V|
   23+25       0.2624      0.03  Q          |          |          |         V|
   23+30       0.2626      0.03  Q          |          |          |         V|
   23+35       0.2627      0.03  Q          |          |          |         V|
   23+40       0.2629      0.03  Q          |          |          |         V|
   23+45       0.2631      0.03  Q          |          |          |         V|
   23+50       0.2633      0.03  Q          |          |          |         V|
   23+55       0.2635      0.03  Q          |          |          |         V|
   24+ 0       0.2636      0.03  Q          |          |          |         V|
   24+ 5       0.2638      0.02  Q          |          |          |         V|
   24+10       0.2639      0.01  Q          |          |          |         V|
   24+15       0.2639      0.01  Q          |          |          |         V|
   24+20       0.2639      0.00  Q          |          |          |         V|
   24+25       0.2640      0.00  Q          |          |          |         V|
   24+30       0.2640      0.00  Q          |          |          |         V|
   24+35       0.2640      0.00  Q          |          |          |         V|
   24+40       0.2640      0.00  Q          |          |          |         V|
   24+45       0.2640      0.00  Q          |          |          |         V|
   24+50       0.2640      0.00  Q          |          |          |          V
-------------------------------------------------------------------------
```

EXISTING CONDITION OFFSITE TOTAL 100-YEAR, 1-HOUR UNIT HYDROGRAPH

U n i t H y d r o g r a p h A n a l y s i s

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Study date 12/21/23 File: A11TRIB1100.out

++

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6586

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

22-0198 - ETHANAC COMMERCE CENTER
OFFSITE UNIT HYDROGRAPH ANALYSIS
A-11 TRIBUTARY, 100-YEAR 24-HOUR
FN: A11TRIB.OUT- RSB

Drainage Area = 235.50(Ac.) = 0.368 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 235.50(Ac.) = 0.368 Sq. Mi.
Length along longest watercourse = 5432.00(Ft.)
Length along longest watercourse measured to centroid = 1784.00(Ft.)
Length along longest watercourse = 1.029 Mi.
Length along longest watercourse measured to centroid = 0.338 Mi.
Difference in elevation = 20.50(Ft.)
Slope along watercourse = 19.9264 Ft./Mi.
Average Manning's 'N' = 0.025
Lag time = 0.227 Hr.
Lag time = 13.65 Min.
25% of lag time = 3.41 Min.
40% of lag time = 5.46 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
235.50	0.50	117.75

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]

```
      235.50          1.20               282.60

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.500(In)
Area Averaged 100-Year Rainfall =    1.200(In)

Point rain (area averaged) =    1.200(In)
Areal adjustment factor =   99.79 %
Adjusted average point rain =    1.197(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    44.000           56.00         0.500
    21.600           75.00         0.500
    88.600           89.00         0.000
     5.400           75.00         0.500
    57.300           69.00         0.900
    18.600           75.00         0.900
 Total Area Entered =    235.50(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
56.0  56.0      0.511     0.500        0.281       0.187      0.052
75.0  75.0      0.303     0.500        0.167       0.092      0.015
89.0  89.0      0.141     0.000        0.141       0.376      0.053
75.0  75.0      0.303     0.500        0.167       0.023      0.004
69.0  69.0      0.373     0.900        0.071       0.243      0.017
75.0  75.0      0.303     0.900        0.058       0.079      0.005
                                                  Sum (F) =   0.147
Area averaged mean soil loss (F) (In/Hr) =  0.147
Minimum soil loss rate ((In/Hr)) =  0.073
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.500
------------------------------------------------------------------------
Slope of intensity-duration curve for a 1 hour storm =0.5000
------------------------------------------------------------------------

              U n i t  H y d r o g r a p h
                     VALLEY S-Curve
------------------------------------------------------------------
              Unit Hydrograph Data
------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                          Graph %           (CFS)
------------------------------------------------------------------
    1   0.083         36.639          3.827             9.083
    2   0.167         73.278         15.298            36.309
    3   0.250        109.918         24.567            58.307
    4   0.333        146.557         18.994            45.081
    5   0.417        183.196          9.692            23.004
    6   0.500        219.835          5.696            13.518
    7   0.583        256.474          4.227            10.033
    8   0.667        293.114          3.309             7.853
    9   0.750        329.753          2.568             6.095
   10   0.833        366.392          2.147             5.097
   11   0.917        403.031          1.700             4.035
```

12	1.000	439.670	1.357	3.222
13	1.083	476.309	1.154	2.738
14	1.167	512.949	1.084	2.572
15	1.250	549.588	0.867	2.059
16	1.333	586.227	0.734	1.743
17	1.417	622.866	0.631	1.498
18	1.500	659.505	0.518	1.230
19	1.583	696.145	0.407	0.965
20	1.667	732.784	0.366	0.870
21	1.750	769.423	0.366	0.870
22	1.833	806.062	0.489	1.161
		Sum = 100.000	Sum=	237.340

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	4.20	0.604	0.147	(0.302)	0.457
2	0.17	4.30	0.618	0.147	(0.309)	0.471
3	0.25	5.00	0.718	0.147	(0.359)	0.572
4	0.33	5.00	0.718	0.147	(0.359)	0.572
5	0.42	5.80	0.833	0.147	(0.417)	0.687
6	0.50	6.50	0.934	0.147	(0.467)	0.787
7	0.58	7.40	1.063	0.147	(0.532)	0.917
8	0.67	8.60	1.236	0.147	(0.618)	1.089
9	0.75	12.30	1.767	0.147	(0.884)	1.621
10	0.83	29.10	4.181	0.147	(2.091)	4.035
11	0.92	6.80	0.977	0.147	(0.489)	0.831
12	1.00	5.00	0.718	0.147	(0.359)	0.572
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	12.6

Flood volume = Effective rainfall 1.05(In)
times area 235.5(Ac.)/[(In)/(Ft.)] = 20.6(Ac.Ft)
Total soil loss = 0.15(In)
Total soil loss = 2.877(Ac.Ft)
Total rainfall = 1.20(In)
Flood volume = 898346.8 Cubic Feet
Total soil loss = 125301.9 Cubic Feet

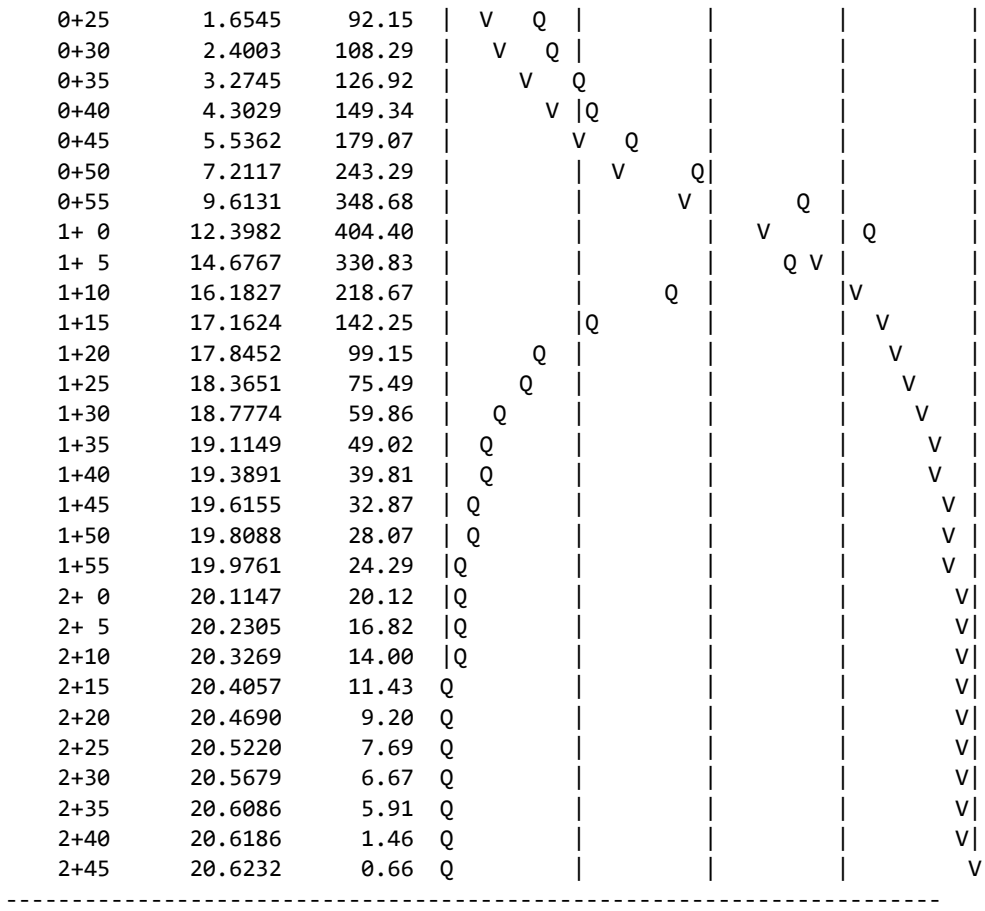
Peak flow rate of this hydrograph = 404.404(CFS)

++

1 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	125.0	250.0	375.0	500.0
0+ 5	0.0286	4.15	Q	|	|	|	|
0+10	0.1724	20.88	VQ	|	|	|	|
0+15	0.5097	48.97	V Q	|	|	|	|
0+20	1.0199	74.08	|V Q	|	|	|	|


0+25 1.6545 92.15
0+30 2.4003 108.29
0+35 3.2745 126.92
0+40 4.3029 149.34
0+45 5.5362 179.07
0+50 7.2117 243.29
0+55 9.6131 348.68
1+ 0 12.3982 404.40
1+ 5 14.6767 330.83
1+10 16.1827 218.67
1+15 17.1624 142.25
1+20 17.8452 99.15
1+25 18.3651 75.49
1+30 18.7774 59.86
1+35 19.1149 49.02
1+40 19.3891 39.81
1+45 19.6155 32.87
1+50 19.8088 28.07
1+55 19.9761 24.29
2+ 0 20.1147 20.12
2+ 5 20.2305 16.82
2+10 20.3269 14.00
2+15 20.4057 11.43
2+20 20.4690 9.20
2+25 20.5220 7.69
2+30 20.5679 6.67
2+35 20.6086 5.91
2+40 20.6186 1.46
2+45 20.6232 0.66

EXISTING CONDITION OFFSITE TOTAL 100-YEAR, 3-HOUR UNIT HYDROGRAPH

U n i t H y d r o g r a p h A n a l y s i s

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Study date 12/21/23 File: A11TRIB3100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6586

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

22-0198 - ETHANAC COMMERCE CENTER
OFFSITE UNIT HYDROGRAPH ANALYSIS
A-11 TRIBUTARY, 100-YEAR 24-HOUR
FN: A11TRIB.OUT- RSB

Drainage Area = 235.50(Ac.) = 0.368 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 235.50(Ac.) = 0.368 Sq. Mi.
Length along longest watercourse = 5432.00(Ft.)
Length along longest watercourse measured to centroid = 1784.00(Ft.)
Length along longest watercourse = 1.029 Mi.
Length along longest watercourse measured to centroid = 0.338 Mi.
Difference in elevation = 20.50(Ft.)
Slope along watercourse = 19.9264 Ft./Mi.
Average Manning's 'N' = 0.025
Lag time = 0.227 Hr.
Lag time = 13.65 Min.
25% of lag time = 3.41 Min.
40% of lag time = 5.46 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
235.50	0.80	188.40

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]

```
      235.50          1.90               447.45

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.800(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.90 %
Adjusted average point rain =    1.898(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    44.000           56.00         0.500
    21.600           75.00         0.500
    88.600           89.00         0.000
     5.400           75.00         0.500
    57.300           69.00         0.900
    18.600           75.00         0.900
 Total Area Entered =    235.50(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
56.0  56.0      0.511     0.500        0.281       0.187      0.052
75.0  75.0      0.303     0.500        0.167       0.092      0.015
89.0  89.0      0.141     0.000        0.141       0.376      0.053
75.0  75.0      0.303     0.500        0.167       0.023      0.004
69.0  69.0      0.373     0.900        0.071       0.243      0.017
75.0  75.0      0.303     0.900        0.058       0.079      0.005
                                                  Sum (F) =   0.147
Area averaged mean soil loss (F) (In/Hr) =  0.147
Minimum soil loss rate ((In/Hr)) =  0.073
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.500
------------------------------------------------------------------------

              U n i t  H y d r o g r a p h
                     VALLEY S-Curve
------------------------------------------------------------------------
              Unit Hydrograph Data
------------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                          Graph %            (CFS)
------------------------------------------------------------------------
    1   0.083         36.639          3.827             9.083
    2   0.167         73.278         15.298            36.309
    3   0.250        109.918         24.567            58.307
    4   0.333        146.557         18.994            45.081
    5   0.417        183.196          9.692            23.004
    6   0.500        219.835          5.696            13.518
    7   0.583        256.474          4.227            10.033
    8   0.667        293.114          3.309             7.853
    9   0.750        329.753          2.568             6.095
   10   0.833        366.392          2.147             5.097
   11   0.917        403.031          1.700             4.035
   12   1.000        439.670          1.357             3.222
   13   1.083        476.309          1.154             2.738
```

14	1.167	512.949	1.084	2.572
15	1.250	549.588	0.867	2.059
16	1.333	586.227	0.734	1.743
17	1.417	622.866	0.631	1.498
18	1.500	659.505	0.518	1.230
19	1.583	696.145	0.407	0.965
20	1.667	732.784	0.366	0.870
21	1.750	769.423	0.366	0.870
22	1.833	806.062	0.489	1.161
			Sum = 100.000	Sum= 237.340

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	1.30	0.296	0.147	(0.148)	0.150
2	0.17	1.30	0.296	0.147	(0.148)	0.150
3	0.25	1.10	0.251	(0.147)	0.125	0.125
4	0.33	1.50	0.342	0.147	(0.171)	0.195
5	0.42	1.50	0.342	0.147	(0.171)	0.195
6	0.50	1.80	0.410	0.147	(0.205)	0.263
7	0.58	1.50	0.342	0.147	(0.171)	0.195
8	0.67	1.80	0.410	0.147	(0.205)	0.263
9	0.75	1.80	0.410	0.147	(0.205)	0.263
10	0.83	1.50	0.342	0.147	(0.171)	0.195
11	0.92	1.60	0.364	0.147	(0.182)	0.218
12	1.00	1.80	0.410	0.147	(0.205)	0.263
13	1.08	2.20	0.501	0.147	(0.251)	0.355
14	1.17	2.20	0.501	0.147	(0.251)	0.355
15	1.25	2.20	0.501	0.147	(0.251)	0.355
16	1.33	2.00	0.456	0.147	(0.228)	0.309
17	1.42	2.60	0.592	0.147	(0.296)	0.446
18	1.50	2.70	0.615	0.147	(0.307)	0.468
19	1.58	2.40	0.547	0.147	(0.273)	0.400
20	1.67	2.70	0.615	0.147	(0.307)	0.468
21	1.75	3.30	0.752	0.147	(0.376)	0.605
22	1.83	3.10	0.706	0.147	(0.353)	0.559
23	1.92	2.90	0.661	0.147	(0.330)	0.514
24	2.00	3.00	0.683	0.147	(0.342)	0.537
25	2.08	3.10	0.706	0.147	(0.353)	0.559
26	2.17	4.20	0.957	0.147	(0.478)	0.810
27	2.25	5.00	1.139	0.147	(0.569)	0.992
28	2.33	3.50	0.797	0.147	(0.399)	0.651
29	2.42	6.80	1.549	0.147	(0.774)	1.402
30	2.50	7.30	1.663	0.147	(0.831)	1.516
31	2.58	8.20	1.868	0.147	(0.934)	1.721
32	2.67	5.90	1.344	0.147	(0.672)	1.197
33	2.75	2.00	0.456	0.147	(0.228)	0.309
34	2.83	1.80	0.410	0.147	(0.205)	0.263
35	2.92	1.80	0.410	0.147	(0.205)	0.263
36	3.00	0.60	0.137	(0.147)	0.068	0.068
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	17.6

Flood volume = Effective rainfall 1.47(In)

```
 times area     235.5(Ac.)/[(In)/(Ft.)] =      28.8(Ac.Ft)
Total soil loss =      0.43(In)
Total soil loss =     8.467(Ac.Ft)
Total rainfall =      1.90(In)
Flood volume =     1253756.2 Cubic Feet
Total soil loss =      368813.9 Cubic Feet
------------------------------------------------------------------------
 Peak flow rate of this hydrograph =    289.328(CFS)
------------------------------------------------------------------------
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                    3 - 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   5   Minute intervals ((CFS))

------------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       75.0     150.0     225.0     300.0
------------------------------------------------------------------------
  0+ 5       0.0094      1.36  Q         |         |         |         |
  0+10       0.0561      6.79  Q         |         |         |         |
  0+15       0.1614     15.29  V Q       |         |         |         |
  0+20       0.3115     21.79  V Q       |         |         |         |
  0+25       0.4930     26.35  V  Q      |         |         |         |
  0+30       0.7132     31.97  V   Q     |         |         |         |
  0+35       0.9744     37.93  |V   Q    |         |         |         |
  0+40       1.2671     42.50  |V   Q    |         |         |         |
  0+45       1.5818     45.70  | V   Q   |         |         |         |
  0+50       1.9181     48.82  | V   Q   |         |         |         |
  0+55       2.2623     49.99  |  V  Q   |         |         |         |
  1+ 0       2.6023     49.36  |  V  Q   |         |         |         |
  1+ 5       2.9572     51.53  |   V Q   |         |         |         |
  1+10       3.3574     58.11  |   V  Q  |         |         |         |
  1+15       3.8120     66.01  |    V  Q |         |         |         |
  1+20       4.3018     71.11  |    V   Q|         |         |         |
  1+25       4.8097     73.75  |     V  Q|         |         |         |
  1+30       5.3486     78.24  |      V  Q         |         |         |
  1+35       5.9400     85.87  |       V |Q        |         |         |
  1+40       6.5711     91.64  |        V| Q       |         |         |
  1+45       7.2319     95.94  |         V Q       |         |         |
  1+50       7.9495    104.19  |         |V Q      |         |         |
  1+55       8.7309    113.47  |         | V  Q    |         |         |
  2+ 0       9.5412    117.65  |         |  V Q    |         |         |
  2+ 5      10.3580    118.59  |         |   VQ    |         |         |
  2+10      11.2044    122.90  |         |    VQ   |         |         |
  2+15      12.1456    136.66  |         |     V Q |         |         |
  2+20      13.2268    156.99  |         |       V Q         |         |
  2+25      14.4309    174.83  |         |         V  Q      |         |
  2+30      15.7967    198.31  |         |          |V    Q  |         |
  2+35      17.4574    241.14  |         |          |   V     | Q       |
  2+40      19.4010    282.21  |         |          |     V   |      Q  |
  2+45      21.3936    289.33  |         |          |        V|       Q |
  2+50      23.1031    248.22  |         |          |         | VQ      |
  2+55      24.3770    184.97  |         |          |   Q     |  V      |
  3+ 0      25.3300    138.38  |         |       Q  |         |    V    |
  3+ 5      26.0785    108.68  |         |   Q      |         |     V   |
  3+10      26.6490     82.84  |         |Q         |         |      V  |
  3+15      27.0721     61.43  |       Q |          |         |      V  |
```

```
    3+20      27.3977     47.28  |     Q   |         |         |       V |
    3+25      27.6593     37.99  |    Q    |         |         |       V |
    3+30      27.8743     31.21  |   Q     |         |         |       V |
    3+35      28.0521     25.82  |  Q      |         |         |       V |
    3+40      28.2010     21.62  | Q       |         |         |        V|
    3+45      28.3254     18.05  | Q       |         |         |        V|
    3+50      28.4283     14.95  |Q        |         |         |        V|
    3+55      28.5145     12.51  |Q        |         |         |        V|
    4+ 0      28.5852     10.26  |Q        |         |         |        V|
    4+ 5      28.6408      8.07  |Q        |         |         |        V|
    4+10      28.6888      6.98  Q         |         |         |        V|
    4+15      28.7262      5.44  Q         |         |         |        V|
    4+20      28.7537      3.99  Q         |         |         |        V|
    4+25      28.7690      2.23  Q         |         |         |        V|
    4+30      28.7751      0.88  Q         |         |         |        V|
    4+35      28.7792      0.59  Q         |         |         |        V|
    4+40      28.7817      0.37  Q         |         |         |        V|
    4+45      28.7823      0.08  Q         |         |         |        V|
-------------------------------------------------------------------------
```

EXISTING CONDITION OFFSITE TOTAL 100-YEAR, 6-HOUR UNIT HYDROGRAPH

U n i t H y d r o g r a p h A n a l y s i s

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Study date 12/21/23 File: A11TRIB6100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6586

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

22-0198 - ETHANAC COMMERCE CENTER
OFFSITE UNIT HYDROGRAPH ANALYSIS
A-11 TRIBUTARY, 100-YEAR 24-HOUR
FN: A11TRIB.OUT- RSB

Drainage Area = 235.50(Ac.) = 0.368 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 235.50(Ac.) = 0.368 Sq. Mi.
Length along longest watercourse = 5432.00(Ft.)
Length along longest watercourse measured to centroid = 1784.00(Ft.)
Length along longest watercourse = 1.029 Mi.
Length along longest watercourse measured to centroid = 0.338 Mi.
Difference in elevation = 20.50(Ft.)
Slope along watercourse = 19.9264 Ft./Mi.
Average Manning's 'N' = 0.025
Lag time = 0.227 Hr.
Lag time = 13.65 Min.
25% of lag time = 3.41 Min.
40% of lag time = 5.46 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

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Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      235.50            1.00                 235.50

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      235.50            2.50                 588.75

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.000(In)
Area Averaged 100-Year Rainfall =    2.500(In)

Point rain (area averaged) =    2.500(In)
Areal adjustment factor =   99.92 %
Adjusted average point rain =    2.498(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    44.000           56.00         0.500
    21.600           75.00         0.500
    88.600           89.00         0.000
     5.400           75.00         0.500
    57.300           69.00         0.900
    18.600           75.00         0.900
 Total Area Entered =    235.50(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
56.0  56.0      0.511     0.500        0.281       0.187      0.052
75.0  75.0      0.303     0.500        0.167       0.092      0.015
89.0  89.0      0.141     0.000        0.141       0.376      0.053
75.0  75.0      0.303     0.500        0.167       0.023      0.004
69.0  69.0      0.373     0.900        0.071       0.243      0.017
75.0  75.0      0.303     0.900        0.058       0.079      0.005
                                                 Sum (F) =   0.147
Area averaged mean soil loss (F) (In/Hr) =  0.147
Minimum soil loss rate ((In/Hr)) =  0.073
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.500
------------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                       VALLEY S-Curve
------------------------------------------------------------------------
               Unit Hydrograph Data
------------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
```

	(hrs)		Graph %	(CFS)
1	0.083	36.639	3.827	9.083
2	0.167	73.278	15.298	36.309
3	0.250	109.918	24.567	58.307
4	0.333	146.557	18.994	45.081
5	0.417	183.196	9.692	23.004
6	0.500	219.835	5.696	13.518
7	0.583	256.474	4.227	10.033
8	0.667	293.114	3.309	7.853
9	0.750	329.753	2.568	6.095
10	0.833	366.392	2.147	5.097
11	0.917	403.031	1.700	4.035
12	1.000	439.670	1.357	3.222
13	1.083	476.309	1.154	2.738
14	1.167	512.949	1.084	2.572
15	1.250	549.588	0.867	2.059
16	1.333	586.227	0.734	1.743
17	1.417	622.866	0.631	1.498
18	1.500	659.505	0.518	1.230
19	1.583	696.145	0.407	0.965
20	1.667	732.784	0.366	0.870
21	1.750	769.423	0.366	0.870
22	1.833	806.062	0.489	1.161
			Sum = 100.000	Sum= 237.340

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max		Low	Effective (In/Hr)
1	0.08	0.50	0.150	(0.147)		0.075	0.075
2	0.17	0.60	0.180	(0.147)		0.090	0.090
3	0.25	0.60	0.180	(0.147)		0.090	0.090
4	0.33	0.60	0.180	(0.147)		0.090	0.090
5	0.42	0.60	0.180	(0.147)		0.090	0.090
6	0.50	0.70	0.210	(0.147)		0.105	0.105
7	0.58	0.70	0.210	(0.147)		0.105	0.105
8	0.67	0.70	0.210	(0.147)		0.105	0.105
9	0.75	0.70	0.210	(0.147)		0.105	0.105
10	0.83	0.70	0.210	(0.147)		0.105	0.105
11	0.92	0.70	0.210	(0.147)		0.105	0.105
12	1.00	0.80	0.240	(0.147)		0.120	0.120
13	1.08	0.80	0.240	(0.147)		0.120	0.120
14	1.17	0.80	0.240	(0.147)		0.120	0.120
15	1.25	0.80	0.240	(0.147)		0.120	0.120
16	1.33	0.80	0.240	(0.147)		0.120	0.120
17	1.42	0.80	0.240	(0.147)		0.120	0.120

18	1.50	0.80	0.240	(0.147)	0.120	0.120
19	1.58	0.80	0.240	(0.147)	0.120	0.120
20	1.67	0.80	0.240	(0.147)	0.120	0.120
21	1.75	0.80	0.240	(0.147)	0.120	0.120
22	1.83	0.80	0.240	(0.147)	0.120	0.120
23	1.92	0.80	0.240	(0.147)	0.120	0.120
24	2.00	0.90	0.270	(0.147)	0.135	0.135
25	2.08	0.80	0.240	(0.147)	0.120	0.120
26	2.17	0.90	0.270	(0.147)	0.135	0.135
27	2.25	0.90	0.270	(0.147)	0.135	0.135
28	2.33	0.90	0.270	(0.147)	0.135	0.135
29	2.42	0.90	0.270	(0.147)	0.135	0.135
30	2.50	0.90	0.270	(0.147)	0.135	0.135
31	2.58	0.90	0.270	(0.147)	0.135	0.135
32	2.67	0.90	0.270	(0.147)	0.135	0.135
33	2.75	1.00	0.300	0.147	(0.150)	0.153
34	2.83	1.00	0.300	0.147	(0.150)	0.153
35	2.92	1.00	0.300	0.147	(0.150)	0.153
36	3.00	1.00	0.300	0.147	(0.150)	0.153
37	3.08	1.00	0.300	0.147	(0.150)	0.153
38	3.17	1.10	0.330	0.147	(0.165)	0.183
39	3.25	1.10	0.330	0.147	(0.165)	0.183
40	3.33	1.10	0.330	0.147	(0.165)	0.183
41	3.42	1.20	0.360	0.147	(0.180)	0.213
42	3.50	1.30	0.390	0.147	(0.195)	0.243
43	3.58	1.40	0.420	0.147	(0.210)	0.273
44	3.67	1.40	0.420	0.147	(0.210)	0.273
45	3.75	1.50	0.450	0.147	(0.225)	0.303
46	3.83	1.50	0.450	0.147	(0.225)	0.303
47	3.92	1.60	0.480	0.147	(0.240)	0.333
48	4.00	1.60	0.480	0.147	(0.240)	0.333
49	4.08	1.70	0.510	0.147	(0.255)	0.363
50	4.17	1.80	0.540	0.147	(0.270)	0.393
51	4.25	1.90	0.570	0.147	(0.285)	0.423
52	4.33	2.00	0.600	0.147	(0.300)	0.453
53	4.42	2.10	0.629	0.147	(0.315)	0.483
54	4.50	2.10	0.629	0.147	(0.315)	0.483
55	4.58	2.20	0.659	0.147	(0.330)	0.513
56	4.67	2.30	0.689	0.147	(0.345)	0.543
57	4.75	2.40	0.719	0.147	(0.360)	0.573
58	4.83	2.40	0.719	0.147	(0.360)	0.573
59	4.92	2.50	0.749	0.147	(0.375)	0.603
60	5.00	2.60	0.779	0.147	(0.390)	0.633
61	5.08	3.10	0.929	0.147	(0.465)	0.783
62	5.17	3.60	1.079	0.147	(0.540)	0.933
63	5.25	3.90	1.169	0.147	(0.585)	1.022
64	5.33	4.20	1.259	0.147	(0.629)	1.112
65	5.42	4.70	1.409	0.147	(0.704)	1.262
66	5.50	5.60	1.679	0.147	(0.839)	1.532
67	5.58	1.90	0.570	0.147	(0.285)	0.423

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68   5.67     0.90      0.270       (  0.147)       0.135        0.135
69   5.75     0.60      0.180       (  0.147)       0.090        0.090
70   5.83     0.50      0.150       (  0.147)       0.075        0.075
71   5.92     0.30      0.090       (  0.147)       0.045        0.045
72   6.00     0.20      0.060       (  0.147)       0.030        0.030
              (Loss Rate Not Used)
   Sum =     100.0                                    Sum =    20.8
      Flood volume = Effective rainfall      1.73(In)
       times area     235.5(Ac.)/[(In)/(Ft.)] =      34.0(Ac.Ft)
      Total soil loss =      0.77(In)
      Total soil loss =    15.057(Ac.Ft)
      Total rainfall =      2.50(In)
      Flood volume =     1479549.8 Cubic Feet
      Total soil loss =      655882.6 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =    249.777(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          6 - 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   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       75.0     150.0     225.0     300.0
-------------------------------------------------------------------------
  0+ 5       0.0047      0.68  Q         |         |         |         |
  0+10       0.0291      3.54  Q         |         |         |         |
  0+15       0.0873      8.46  VQ        |         |         |         |
  0+20       0.1748     12.71  VQ        |         |         |         |
  0+25       0.2789     15.11  V Q       |         |         |         |
  0+30       0.3933     16.61  V Q       |         |         |         |
  0+35       0.5180     18.11  V Q       |         |         |         |
  0+40       0.6538     19.72  V Q       |         |         |         |
  0+45       0.7982     20.97  V Q       |         |         |         |
  0+50       0.9482     21.79  |VQ       |         |         |         |
  0+55       1.1023     22.37  |VQ       |         |         |         |
  1+ 0       1.2604     22.96  |V Q      |         |         |         |
  1+ 5       1.4248     23.87  |V Q      |         |         |         |
  1+10       1.5975     25.07  |V Q      |         |         |         |
  1+15       1.7767     26.02  | VQ      |         |         |         |
  1+20       1.9598     26.59  | VQ      |         |         |         |
  1+25       2.1456     26.98  | VQ      |         |         |         |
  1+30       2.3335     27.28  | VQ      |         |         |         |
  1+35       2.5231     27.53  | VQ      |         |         |         |
  1+40       2.7141     27.73  |  Q      |         |         |         |
  1+45       2.9063     27.91  |  Q      |         |         |         |
  1+50       3.0998     28.09  |  Q      |         |         |         |
  1+55       3.2939     28.18  |  Q      |         |         |         |
  2+ 0       3.4893     28.37  |  QV     |         |         |         |
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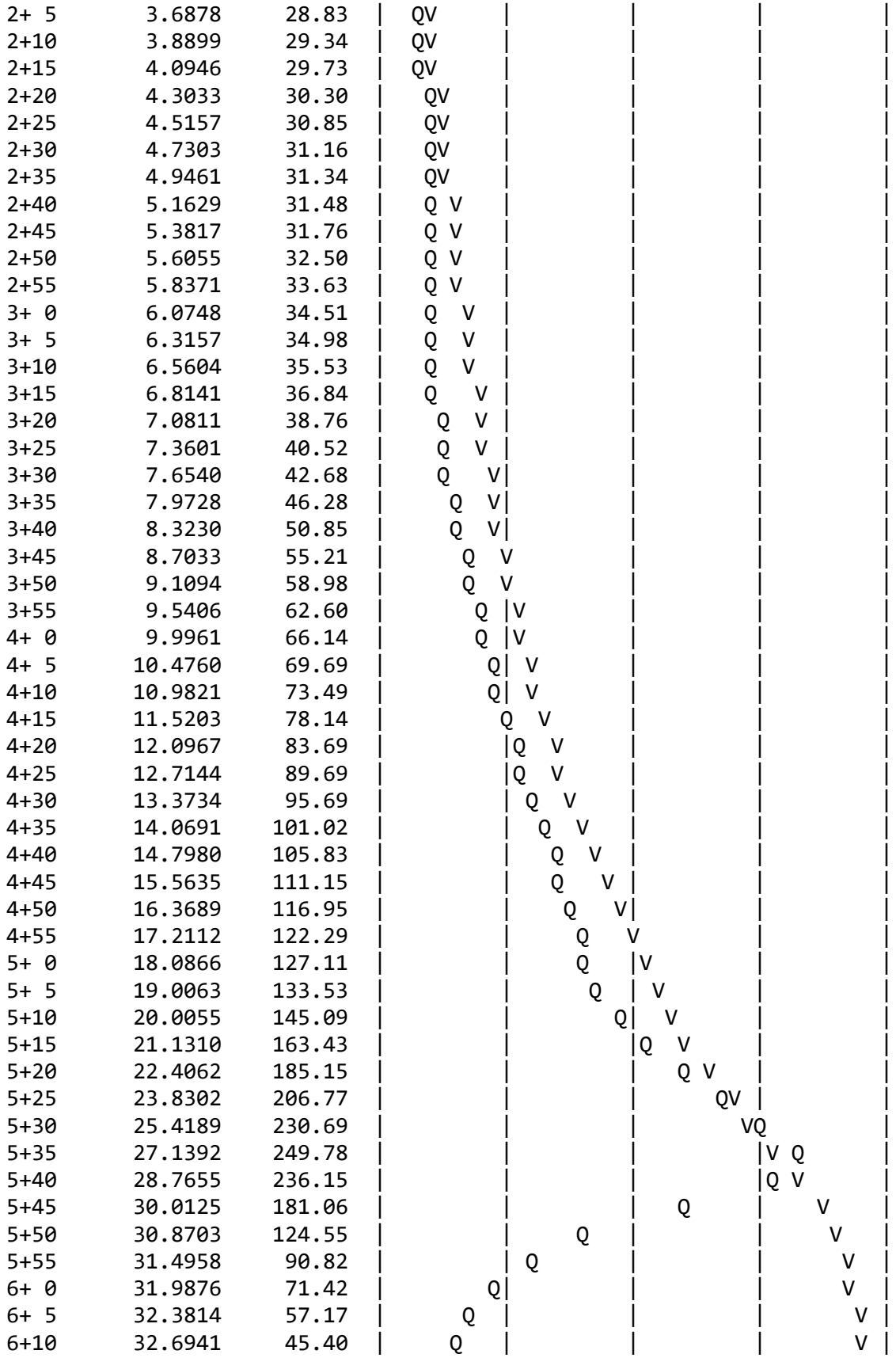

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    6+15      32.9420     35.99  |   Q     |         |         |       V |
    6+20      33.1401     28.76  |  Q      |         |         |        V|
    6+25      33.3022     23.54  |  Q      |         |         |        V|
    6+30      33.4376     19.66  | Q       |         |         |        V|
    6+35      33.5513     16.51  | Q       |         |         |        V|
    6+40      33.6448     13.58  |Q        |         |         |        V|
    6+45      33.7218     11.19  |Q        |         |         |        V|
    6+50      33.7855      9.25  |Q        |         |         |        V|
    6+55      33.8373      7.51  |Q        |         |         |        V|
    7+ 0      33.8783      5.96  Q         |         |         |        V|
    7+ 5      33.9109      4.73  Q         |         |         |        V|
    7+10      33.9361      3.66  Q         |         |         |        V|
    7+15      33.9538      2.56  Q         |         |         |        V|
    7+20      33.9597      0.86  Q         |         |         |        V|
    7+25      33.9623      0.38  Q         |         |         |        V|
    7+30      33.9640      0.24  Q         |         |         |        V|
    7+35      33.9650      0.15  Q         |         |         |        V|
    7+40      33.9655      0.08  Q         |         |         |        V|
    7+45      33.9658      0.03  Q         |         |         |         V
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EXISTING CONDITION OFFSITE TOTAL 100-YEAR, 24-HOUR UNIT HYDROGRAPH

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2018, Version 9.0
Study date 12/21/23 File: A11TRIB24100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6586

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

22-0198 - ETHANAC COMMERCE CENTER
OFFSITE UNIT HYDROGRAPH ANALYSIS
A-11 TRIBUTARY, 100-YEAR 24-HOUR
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Drainage Area for Depth-Area Areal Adjustment = 235.50(Ac.) = 0.368 Sq. Mi.
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Length along longest watercourse measured to centroid = 1784.00(Ft.)
Length along longest watercourse = 1.029 Mi.
Length along longest watercourse measured to centroid = 0.338 Mi.
Difference in elevation = 20.50(Ft.)
Slope along watercourse = 19.9264 Ft./Mi.
Average Manning's 'N' = 0.025
Lag time = 0.227 Hr.
Lag time = 13.65 Min.
25% of lag time = 3.41 Min.
40% of lag time = 5.46 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

```
Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      235.50            1.60                 376.80

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
      235.50            4.00                 942.00

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.600(In)
Area Averaged 100-Year Rainfall =    4.000(In)

Point rain (area averaged) =    4.000(In)
Areal adjustment factor =   99.95 %
Adjusted average point rain =    3.998(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    44.000           56.00         0.500
    21.600           75.00         0.500
    88.600           89.00         0.000
     5.400           75.00         0.500
    57.300           69.00         0.900
    18.600           75.00         0.900
 Total Area Entered =    235.50(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
56.0  56.0      0.511     0.500        0.281       0.187      0.052
75.0  75.0      0.303     0.500        0.167       0.092      0.015
89.0  89.0      0.141     0.000        0.141       0.376      0.053
75.0  75.0      0.303     0.500        0.167       0.023      0.004
69.0  69.0      0.373     0.900        0.071       0.243      0.017
75.0  75.0      0.303     0.900        0.058       0.079      0.005
                                                 Sum (F) =   0.147
Area averaged mean soil loss (F) (In/Hr) =  0.147
Minimum soil loss rate ((In/Hr)) =  0.073
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.500
------------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                       VALLEY S-Curve
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               Unit Hydrograph Data
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Unit time period   Time % of lag   Distribution   Unit Hydrograph
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19	1.583	696.145	0.407	0.965
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22	1.833	806.062	0.489	1.161
			Sum = 100.000	Sum= 237.340

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.032	(0.260)	0.016	0.016
2	0.17	0.07	0.032	(0.259)	0.016	0.016
3	0.25	0.07	0.032	(0.258)	0.016	0.016
4	0.33	0.10	0.048	(0.257)	0.024	0.024
5	0.42	0.10	0.048	(0.256)	0.024	0.024
6	0.50	0.10	0.048	(0.255)	0.024	0.024
7	0.58	0.10	0.048	(0.254)	0.024	0.024
8	0.67	0.10	0.048	(0.253)	0.024	0.024
9	0.75	0.10	0.048	(0.252)	0.024	0.024
10	0.83	0.13	0.064	(0.251)	0.032	0.032
11	0.92	0.13	0.064	(0.250)	0.032	0.032
12	1.00	0.13	0.064	(0.249)	0.032	0.032
13	1.08	0.10	0.048	(0.248)	0.024	0.024
14	1.17	0.10	0.048	(0.247)	0.024	0.024
15	1.25	0.10	0.048	(0.246)	0.024	0.024
16	1.33	0.10	0.048	(0.245)	0.024	0.024
17	1.42	0.10	0.048	(0.244)	0.024	0.024

18	1.50	0.10	0.048	(0.243)	0.024	0.024
19	1.58	0.10	0.048	(0.242)	0.024	0.024
20	1.67	0.10	0.048	(0.241)	0.024	0.024
21	1.75	0.10	0.048	(0.240)	0.024	0.024
22	1.83	0.13	0.064	(0.239)	0.032	0.032
23	1.92	0.13	0.064	(0.238)	0.032	0.032
24	2.00	0.13	0.064	(0.237)	0.032	0.032
25	2.08	0.13	0.064	(0.236)	0.032	0.032
26	2.17	0.13	0.064	(0.235)	0.032	0.032
27	2.25	0.13	0.064	(0.234)	0.032	0.032
28	2.33	0.13	0.064	(0.233)	0.032	0.032
29	2.42	0.13	0.064	(0.232)	0.032	0.032
30	2.50	0.13	0.064	(0.231)	0.032	0.032
31	2.58	0.17	0.080	(0.231)	0.040	0.040
32	2.67	0.17	0.080	(0.230)	0.040	0.040
33	2.75	0.17	0.080	(0.229)	0.040	0.040
34	2.83	0.17	0.080	(0.228)	0.040	0.040
35	2.92	0.17	0.080	(0.227)	0.040	0.040
36	3.00	0.17	0.080	(0.226)	0.040	0.040
37	3.08	0.17	0.080	(0.225)	0.040	0.040
38	3.17	0.17	0.080	(0.224)	0.040	0.040
39	3.25	0.17	0.080	(0.223)	0.040	0.040
40	3.33	0.17	0.080	(0.222)	0.040	0.040
41	3.42	0.17	0.080	(0.221)	0.040	0.040
42	3.50	0.17	0.080	(0.220)	0.040	0.040
43	3.58	0.17	0.080	(0.219)	0.040	0.040
44	3.67	0.17	0.080	(0.218)	0.040	0.040
45	3.75	0.17	0.080	(0.217)	0.040	0.040
46	3.83	0.20	0.096	(0.217)	0.048	0.048
47	3.92	0.20	0.096	(0.216)	0.048	0.048
48	4.00	0.20	0.096	(0.215)	0.048	0.048
49	4.08	0.20	0.096	(0.214)	0.048	0.048
50	4.17	0.20	0.096	(0.213)	0.048	0.048
51	4.25	0.20	0.096	(0.212)	0.048	0.048
52	4.33	0.23	0.112	(0.211)	0.056	0.056
53	4.42	0.23	0.112	(0.210)	0.056	0.056
54	4.50	0.23	0.112	(0.209)	0.056	0.056
55	4.58	0.23	0.112	(0.208)	0.056	0.056
56	4.67	0.23	0.112	(0.208)	0.056	0.056
57	4.75	0.23	0.112	(0.207)	0.056	0.056
58	4.83	0.27	0.128	(0.206)	0.064	0.064
59	4.92	0.27	0.128	(0.205)	0.064	0.064
60	5.00	0.27	0.128	(0.204)	0.064	0.064
61	5.08	0.20	0.096	(0.203)	0.048	0.048
62	5.17	0.20	0.096	(0.202)	0.048	0.048
63	5.25	0.20	0.096	(0.201)	0.048	0.048
64	5.33	0.23	0.112	(0.200)	0.056	0.056
65	5.42	0.23	0.112	(0.200)	0.056	0.056
66	5.50	0.23	0.112	(0.199)	0.056	0.056
67	5.58	0.27	0.128	(0.198)	0.064	0.064

68	5.67	0.27	0.128	(0.197)	0.064	0.064
69	5.75	0.27	0.128	(0.196)	0.064	0.064
70	5.83	0.27	0.128	(0.195)	0.064	0.064
71	5.92	0.27	0.128	(0.194)	0.064	0.064
72	6.00	0.27	0.128	(0.193)	0.064	0.064
73	6.08	0.30	0.144	(0.193)	0.072	0.072
74	6.17	0.30	0.144	(0.192)	0.072	0.072
75	6.25	0.30	0.144	(0.191)	0.072	0.072
76	6.33	0.30	0.144	(0.190)	0.072	0.072
77	6.42	0.30	0.144	(0.189)	0.072	0.072
78	6.50	0.30	0.144	(0.188)	0.072	0.072
79	6.58	0.33	0.160	(0.188)	0.080	0.080
80	6.67	0.33	0.160	(0.187)	0.080	0.080
81	6.75	0.33	0.160	(0.186)	0.080	0.080
82	6.83	0.33	0.160	(0.185)	0.080	0.080
83	6.92	0.33	0.160	(0.184)	0.080	0.080
84	7.00	0.33	0.160	(0.183)	0.080	0.080
85	7.08	0.33	0.160	(0.182)	0.080	0.080
86	7.17	0.33	0.160	(0.182)	0.080	0.080
87	7.25	0.33	0.160	(0.181)	0.080	0.080
88	7.33	0.37	0.176	(0.180)	0.088	0.088
89	7.42	0.37	0.176	(0.179)	0.088	0.088
90	7.50	0.37	0.176	(0.178)	0.088	0.088
91	7.58	0.40	0.192	(0.178)	0.096	0.096
92	7.67	0.40	0.192	(0.177)	0.096	0.096
93	7.75	0.40	0.192	(0.176)	0.096	0.096
94	7.83	0.43	0.208	(0.175)	0.104	0.104
95	7.92	0.43	0.208	(0.174)	0.104	0.104
96	8.00	0.43	0.208	(0.173)	0.104	0.104
97	8.08	0.50	0.240	(0.173)	0.120	0.120
98	8.17	0.50	0.240	(0.172)	0.120	0.120
99	8.25	0.50	0.240	(0.171)	0.120	0.120
100	8.33	0.50	0.240	(0.170)	0.120	0.120
101	8.42	0.50	0.240	(0.169)	0.120	0.120
102	8.50	0.50	0.240	(0.169)	0.120	0.120
103	8.58	0.53	0.256	(0.168)	0.128	0.128
104	8.67	0.53	0.256	(0.167)	0.128	0.128
105	8.75	0.53	0.256	(0.166)	0.128	0.128
106	8.83	0.57	0.272	(0.166)	0.136	0.136
107	8.92	0.57	0.272	(0.165)	0.136	0.136
108	9.00	0.57	0.272	(0.164)	0.136	0.136
109	9.08	0.63	0.304	(0.163)	0.152	0.152
110	9.17	0.63	0.304	(0.162)	0.152	0.152
111	9.25	0.63	0.304	(0.162)	0.152	0.152
112	9.33	0.67	0.320	(0.161)	0.160	0.160
113	9.42	0.67	0.320	(0.160)	0.160	0.160
114	9.50	0.67	0.320	0.159	(0.160)	0.161
115	9.58	0.70	0.336	0.159	(0.168)	0.177
116	9.67	0.70	0.336	0.158	(0.168)	0.178
117	9.75	0.70	0.336	0.157	(0.168)	0.179

118	9.83	0.73	0.352		0.156	(0.176)		0.196
119	9.92	0.73	0.352		0.156	(0.176)		0.196
120	10.00	0.73	0.352		0.155	(0.176)		0.197
121	10.08	0.50	0.240	(0.154)			0.120	0.120
122	10.17	0.50	0.240	(0.153)			0.120	0.120
123	10.25	0.50	0.240	(0.153)			0.120	0.120
124	10.33	0.50	0.240	(0.152)			0.120	0.120
125	10.42	0.50	0.240	(0.151)			0.120	0.120
126	10.50	0.50	0.240	(0.150)			0.120	0.120
127	10.58	0.67	0.320		0.150	(0.160)		0.170
128	10.67	0.67	0.320		0.149	(0.160)		0.171
129	10.75	0.67	0.320		0.148	(0.160)		0.172
130	10.83	0.67	0.320		0.147	(0.160)		0.172
131	10.92	0.67	0.320		0.147	(0.160)		0.173
132	11.00	0.67	0.320		0.146	(0.160)		0.174
133	11.08	0.63	0.304		0.145	(0.152)		0.159
134	11.17	0.63	0.304		0.145	(0.152)		0.159
135	11.25	0.63	0.304		0.144	(0.152)		0.160
136	11.33	0.63	0.304		0.143	(0.152)		0.161
137	11.42	0.63	0.304		0.142	(0.152)		0.161
138	11.50	0.63	0.304		0.142	(0.152)		0.162
139	11.58	0.57	0.272	(0.141)			0.136	0.136
140	11.67	0.57	0.272	(0.140)			0.136	0.136
141	11.75	0.57	0.272	(0.140)			0.136	0.136
142	11.83	0.60	0.288		0.139	(0.144)		0.149
143	11.92	0.60	0.288		0.138	(0.144)		0.150
144	12.00	0.60	0.288		0.138	(0.144)		0.150
145	12.08	0.83	0.400		0.137	(0.200)		0.263
146	12.17	0.83	0.400		0.136	(0.200)		0.264
147	12.25	0.83	0.400		0.135	(0.200)		0.264
148	12.33	0.87	0.416		0.135	(0.208)		0.281
149	12.42	0.87	0.416		0.134	(0.208)		0.282
150	12.50	0.87	0.416		0.133	(0.208)		0.282
151	12.58	0.93	0.448		0.133	(0.224)		0.315
152	12.67	0.93	0.448		0.132	(0.224)		0.316
153	12.75	0.93	0.448		0.131	(0.224)		0.316
154	12.83	0.97	0.464		0.131	(0.232)		0.333
155	12.92	0.97	0.464		0.130	(0.232)		0.334
156	13.00	0.97	0.464		0.129	(0.232)		0.334
157	13.08	1.13	0.544		0.129	(0.272)		0.415
158	13.17	1.13	0.544		0.128	(0.272)		0.416
159	13.25	1.13	0.544		0.127	(0.272)		0.416
160	13.33	1.13	0.544		0.127	(0.272)		0.417
161	13.42	1.13	0.544		0.126	(0.272)		0.418
162	13.50	1.13	0.544		0.126	(0.272)		0.418
163	13.58	0.77	0.368		0.125	(0.184)		0.243
164	13.67	0.77	0.368		0.124	(0.184)		0.244
165	13.75	0.77	0.368		0.124	(0.184)		0.244
166	13.83	0.77	0.368		0.123	(0.184)		0.245
167	13.92	0.77	0.368		0.122	(0.184)		0.245

168	14.00	0.77	0.368	0.122	(0.184)	0.246
169	14.08	0.90	0.432	0.121	(0.216)	0.311
170	14.17	0.90	0.432	0.121	(0.216)	0.311
171	14.25	0.90	0.432	0.120	(0.216)	0.312
172	14.33	0.87	0.416	0.119	(0.208)	0.297
173	14.42	0.87	0.416	0.119	(0.208)	0.297
174	14.50	0.87	0.416	0.118	(0.208)	0.298
175	14.58	0.87	0.416	0.117	(0.208)	0.298
176	14.67	0.87	0.416	0.117	(0.208)	0.299
177	14.75	0.87	0.416	0.116	(0.208)	0.300
178	14.83	0.83	0.400	0.116	(0.200)	0.284
179	14.92	0.83	0.400	0.115	(0.200)	0.285
180	15.00	0.83	0.400	0.114	(0.200)	0.285
181	15.08	0.80	0.384	0.114	(0.192)	0.270
182	15.17	0.80	0.384	0.113	(0.192)	0.271
183	15.25	0.80	0.384	0.113	(0.192)	0.271
184	15.33	0.77	0.368	0.112	(0.184)	0.256
185	15.42	0.77	0.368	0.112	(0.184)	0.256
186	15.50	0.77	0.368	0.111	(0.184)	0.257
187	15.58	0.63	0.304	0.110	(0.152)	0.193
188	15.67	0.63	0.304	0.110	(0.152)	0.194
189	15.75	0.63	0.304	0.109	(0.152)	0.195
190	15.83	0.63	0.304	0.109	(0.152)	0.195
191	15.92	0.63	0.304	0.108	(0.152)	0.196
192	16.00	0.63	0.304	0.108	(0.152)	0.196
193	16.08	0.13	0.064	(0.107)	0.032	0.032
194	16.17	0.13	0.064	(0.107)	0.032	0.032
195	16.25	0.13	0.064	(0.106)	0.032	0.032
196	16.33	0.13	0.064	(0.105)	0.032	0.032
197	16.42	0.13	0.064	(0.105)	0.032	0.032
198	16.50	0.13	0.064	(0.104)	0.032	0.032
199	16.58	0.10	0.048	(0.104)	0.024	0.024
200	16.67	0.10	0.048	(0.103)	0.024	0.024
201	16.75	0.10	0.048	(0.103)	0.024	0.024
202	16.83	0.10	0.048	(0.102)	0.024	0.024
203	16.92	0.10	0.048	(0.102)	0.024	0.024
204	17.00	0.10	0.048	(0.101)	0.024	0.024
205	17.08	0.17	0.080	(0.101)	0.040	0.040
206	17.17	0.17	0.080	(0.100)	0.040	0.040
207	17.25	0.17	0.080	(0.100)	0.040	0.040
208	17.33	0.17	0.080	(0.099)	0.040	0.040
209	17.42	0.17	0.080	(0.099)	0.040	0.040
210	17.50	0.17	0.080	(0.098)	0.040	0.040
211	17.58	0.17	0.080	(0.098)	0.040	0.040
212	17.67	0.17	0.080	(0.097)	0.040	0.040
213	17.75	0.17	0.080	(0.097)	0.040	0.040
214	17.83	0.13	0.064	(0.096)	0.032	0.032
215	17.92	0.13	0.064	(0.096)	0.032	0.032
216	18.00	0.13	0.064	(0.095)	0.032	0.032
217	18.08	0.13	0.064	(0.095)	0.032	0.032

218	18.17	0.13	0.064	(0.094)	0.032	0.032
219	18.25	0.13	0.064	(0.094)	0.032	0.032
220	18.33	0.13	0.064	(0.093)	0.032	0.032
221	18.42	0.13	0.064	(0.093)	0.032	0.032
222	18.50	0.13	0.064	(0.093)	0.032	0.032
223	18.58	0.10	0.048	(0.092)	0.024	0.024
224	18.67	0.10	0.048	(0.092)	0.024	0.024
225	18.75	0.10	0.048	(0.091)	0.024	0.024
226	18.83	0.07	0.032	(0.091)	0.016	0.016
227	18.92	0.07	0.032	(0.090)	0.016	0.016
228	19.00	0.07	0.032	(0.090)	0.016	0.016
229	19.08	0.10	0.048	(0.090)	0.024	0.024
230	19.17	0.10	0.048	(0.089)	0.024	0.024
231	19.25	0.10	0.048	(0.089)	0.024	0.024
232	19.33	0.13	0.064	(0.088)	0.032	0.032
233	19.42	0.13	0.064	(0.088)	0.032	0.032
234	19.50	0.13	0.064	(0.087)	0.032	0.032
235	19.58	0.10	0.048	(0.087)	0.024	0.024
236	19.67	0.10	0.048	(0.087)	0.024	0.024
237	19.75	0.10	0.048	(0.086)	0.024	0.024
238	19.83	0.07	0.032	(0.086)	0.016	0.016
239	19.92	0.07	0.032	(0.085)	0.016	0.016
240	20.00	0.07	0.032	(0.085)	0.016	0.016
241	20.08	0.10	0.048	(0.085)	0.024	0.024
242	20.17	0.10	0.048	(0.084)	0.024	0.024
243	20.25	0.10	0.048	(0.084)	0.024	0.024
244	20.33	0.10	0.048	(0.084)	0.024	0.024
245	20.42	0.10	0.048	(0.083)	0.024	0.024
246	20.50	0.10	0.048	(0.083)	0.024	0.024
247	20.58	0.10	0.048	(0.083)	0.024	0.024
248	20.67	0.10	0.048	(0.082)	0.024	0.024
249	20.75	0.10	0.048	(0.082)	0.024	0.024
250	20.83	0.07	0.032	(0.082)	0.016	0.016
251	20.92	0.07	0.032	(0.081)	0.016	0.016
252	21.00	0.07	0.032	(0.081)	0.016	0.016
253	21.08	0.10	0.048	(0.081)	0.024	0.024
254	21.17	0.10	0.048	(0.080)	0.024	0.024
255	21.25	0.10	0.048	(0.080)	0.024	0.024
256	21.33	0.07	0.032	(0.080)	0.016	0.016
257	21.42	0.07	0.032	(0.079)	0.016	0.016
258	21.50	0.07	0.032	(0.079)	0.016	0.016
259	21.58	0.10	0.048	(0.079)	0.024	0.024
260	21.67	0.10	0.048	(0.078)	0.024	0.024
261	21.75	0.10	0.048	(0.078)	0.024	0.024
262	21.83	0.07	0.032	(0.078)	0.016	0.016
263	21.92	0.07	0.032	(0.078)	0.016	0.016
264	22.00	0.07	0.032	(0.077)	0.016	0.016
265	22.08	0.10	0.048	(0.077)	0.024	0.024
266	22.17	0.10	0.048	(0.077)	0.024	0.024
267	22.25	0.10	0.048	(0.077)	0.024	0.024

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268  22.33     0.07      0.032       (  0.076)       0.016        0.016
269  22.42     0.07      0.032       (  0.076)       0.016        0.016
270  22.50     0.07      0.032       (  0.076)       0.016        0.016
271  22.58     0.07      0.032       (  0.076)       0.016        0.016
272  22.67     0.07      0.032       (  0.076)       0.016        0.016
273  22.75     0.07      0.032       (  0.075)       0.016        0.016
274  22.83     0.07      0.032       (  0.075)       0.016        0.016
275  22.92     0.07      0.032       (  0.075)       0.016        0.016
276  23.00     0.07      0.032       (  0.075)       0.016        0.016
277  23.08     0.07      0.032       (  0.075)       0.016        0.016
278  23.17     0.07      0.032       (  0.074)       0.016        0.016
279  23.25     0.07      0.032       (  0.074)       0.016        0.016
280  23.33     0.07      0.032       (  0.074)       0.016        0.016
281  23.42     0.07      0.032       (  0.074)       0.016        0.016
282  23.50     0.07      0.032       (  0.074)       0.016        0.016
283  23.58     0.07      0.032       (  0.074)       0.016        0.016
284  23.67     0.07      0.032       (  0.074)       0.016        0.016
285  23.75     0.07      0.032       (  0.073)       0.016        0.016
286  23.83     0.07      0.032       (  0.073)       0.016        0.016
287  23.92     0.07      0.032       (  0.073)       0.016        0.016
288  24.00     0.07      0.032       (  0.073)       0.016        0.016
                (Loss Rate Not Used)
    Sum =     100.0                                    Sum =    28.2
       Flood volume = Effective rainfall      2.35(In)
        times area     235.5(Ac.)/[(In)/(Ft.)] =      46.2(Ac.Ft)
       Total soil loss =      1.64(In)
       Total soil loss =    32.281(Ac.Ft)
       Total rainfall =      4.00(In)
       Flood volume =     2011715.0 Cubic Feet
       Total soil loss =     1406172.2 Cubic Feet
       ---------------------------------------------------------------------
        Peak flow rate of this hydrograph =     92.977(CFS)
       ---------------------------------------------------------------------
       +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - 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   5   Minute intervals ((CFS))

       ---------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0       25.0      50.0      75.0     100.0
 ---------------------------------------------------------------------------
   0+ 5       0.0010      0.15  Q         |         |         |         |
   0+10       0.0060      0.73  Q         |         |         |         |
   0+15       0.0174      1.66  Q         |         |         |         |
   0+20       0.0343      2.45  Q         |         |         |         |
   0+25       0.0558      3.11  VQ        |         |         |         |
   0+30       0.0819      3.79  VQ        |         |         |         |
   0+35       0.1116      4.32  VQ        |         |         |         |
   0+40       0.1435      4.63  VQ        |         |         |         |
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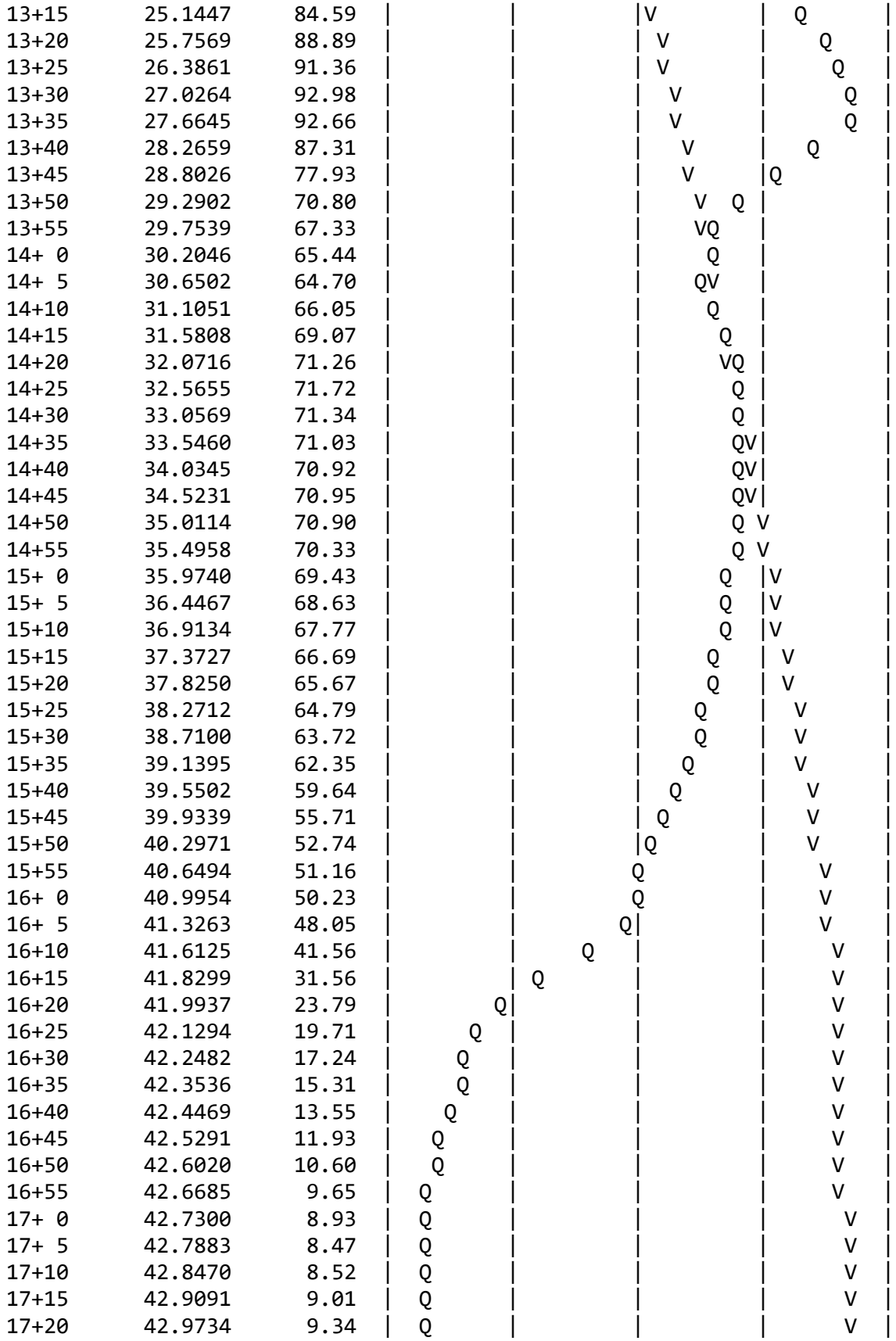
0+45	0.1767	4.83	VQ	|	|	|	|
0+50	0.2116	5.07	V Q	|	|	|	|
0+55	0.2494	5.48	V Q	|	|	|	|
1+ 0	0.2911	6.05	V Q	|	|	|	|
1+ 5	0.3353	6.42	V Q	|	|	|	|
1+10	0.3793	6.39	V Q	|	|	|	|
1+15	0.4213	6.09	V Q	|	|	|	|
1+20	0.4616	5.86	V Q	|	|	|	|
1+25	0.5014	5.78	V Q	|	|	|	|
1+30	0.5411	5.76	V Q	|	|	|	|
1+35	0.5807	5.75	V Q	|	|	|	|
1+40	0.6203	5.75	V Q	|	|	|	|
1+45	0.6598	5.75	V Q	|	|	|	|
1+50	0.7000	5.83	V Q	|	|	|	|
1+55	0.7421	6.11	V Q	|	|	|	|
2+ 0	0.7873	6.58	V Q	|	|	|	|
2+ 5	0.8351	6.94	V Q	|	|	|	|
2+10	0.8841	7.11	V Q	|	|	|	|
2+15	0.9338	7.21	V Q	|	|	|	|
2+20	0.9840	7.29	V Q	|	|	|	|
2+25	1.0346	7.35	V Q	|	|	|	|
2+30	1.0855	7.39	V Q	|	|	|	|
2+35	1.1372	7.51	V Q	|	|	|	|
2+40	1.1911	7.82	|V Q	|	|	|	|
2+45	1.2483	8.31	|V Q	|	|	|	|
2+50	1.3081	8.68	|V Q	|	|	|	|
2+55	1.3693	8.89	|V Q	|	|	|	|
3+ 0	1.4314	9.01	|V Q	|	|	|	|
3+ 5	1.4941	9.11	|V Q	|	|	|	|
3+10	1.5573	9.18	|V Q	|	|	|	|
3+15	1.6209	9.24	|V Q	|	|	|	|
3+20	1.6849	9.29	|V Q	|	|	|	|
3+25	1.7491	9.33	|V Q	|	|	|	|
3+30	1.8136	9.36	|V Q	|	|	|	|
3+35	1.8783	9.39	|V Q	|	|	|	|
3+40	1.9431	9.41	|V Q	|	|	|	|
3+45	2.0080	9.43	|V Q	|	|	|	|
3+50	2.0735	9.51	|V Q	|	|	|	|
3+55	2.1411	9.82	|V Q	|	|	|	|
4+ 0	2.2120	10.29	|V Q	|	|	|	|
4+ 5	2.2854	10.66	|V Q	|	|	|	|
4+10	2.3602	10.85	| V Q	|	|	|	|
4+15	2.4357	10.97	| V Q	|	|	|	|
4+20	2.5124	11.13	| V Q	|	|	|	|
4+25	2.5914	11.48	| V Q	|	|	|	|
4+30	2.6741	12.00	| V Q	|	|	|	|
4+35	2.7595	12.40	| V Q	|	|	|	|
4+40	2.8464	12.62	| V Q	|	|	|	|
4+45	2.9342	12.75	| V Q	|	|	|	|
4+50	3.0232	12.92	| V Q	|	|	|	|

```
4+55       3.1148     13.30  | V  Q    |         |         |         |
5+ 0       3.2100     13.83  | V  Q    |         |         |         |
5+ 5       3.3071     14.10  | V  Q    |         |         |         |
5+10       3.4018     13.75  | V  Q    |         |         |         |
5+15       3.4911     12.96  |  V Q    |         |         |         |
5+20       3.5766     12.42  |  VQ     |         |         |         |
5+25       3.6622     12.43  |  VQ     |         |         |         |
5+30       3.7501     12.75  |  V Q    |         |         |         |
5+35       3.8402     13.09  |  V Q    |         |         |         |
5+40       3.9331     13.48  |  V Q    |         |         |         |
5+45       4.0295     14.00  |  V Q    |         |         |         |
5+50       4.1286     14.39  |  V Q    |         |         |         |
5+55       4.2291     14.60  |  V Q    |         |         |         |
6+ 0       4.3305     14.73  |  V Q    |         |         |         |
6+ 5       4.4331     14.90  |  V Q    |         |         |         |
6+10       4.5382     15.25  |  V  Q   |         |         |         |
6+15       4.6468     15.77  |   V Q   |         |         |         |
6+20       4.7582     16.18  |   V Q   |         |         |         |
6+25       4.8711     16.40  |   V Q   |         |         |         |
6+30       4.9850     16.53  |   V Q   |         |         |         |
6+35       5.1001     16.72  |   V Q   |         |         |         |
6+40       5.2178     17.09  |   V Q   |         |         |         |
6+45       5.3391     17.62  |   V  Q  |         |         |         |
6+50       5.4632     18.02  |   V  Q  |         |         |         |
6+55       5.5889     18.26  |   V  Q  |         |         |         |
7+ 0       5.7157     18.41  |   V  Q  |         |         |         |
7+ 5       5.8433     18.53  |    V Q  |         |         |         |
7+10       5.9715     18.62  |    V Q  |         |         |         |
7+15       6.1002     18.69  |    V Q  |         |         |         |
7+20       6.2298     18.82  |    V Q  |         |         |         |
7+25       6.3618     19.16  |    V Q  |         |         |         |
7+30       6.4972     19.66  |    V Q  |         |         |         |
7+35       6.6358     20.12  |    V  Q |         |         |         |
7+40       6.7779     20.63  |    V  Q |         |         |         |
7+45       6.9240     21.22  |    V  Q |         |         |         |
7+50       7.0739     21.76  |     V Q |         |         |         |
7+55       7.2276     22.31  |     V Q |         |         |         |
8+ 0       7.3856     22.94  |     V  Q|         |         |         |
8+ 5       7.5480     23.58  |     V  Q|         |         |         |
8+10       7.7163     24.45  |     V  Q|         |         |         |
8+15       7.8924     25.57  |     V   Q         |         |         |
8+20       8.0745     26.44  |     V   Q         |         |         |
8+25       8.2600     26.93  |      V  Q         |         |         |
8+30       8.4475     27.23  |      V  Q         |         |         |
8+35       8.6372     27.54  |      V  |Q        |         |         |
8+40       8.8302     28.02  |      V  |Q        |         |         |
8+45       9.0274     28.64  |      V  |Q        |         |         |
8+50       9.2285     29.20  |      V  |Q        |         |         |
8+55       9.4336     29.78  |       V |Q        |         |         |
9+ 0       9.6432     30.44  |       V | Q       |         |         |
```

9+ 5	9.8574	31.10	V | Q	|	|	|
9+10	10.0777	31.99	V | Q	|	|	|
9+15	10.3058	33.12	V | Q	|	|	|
9+20	10.5406	34.08	V| Q	|	|	|
9+25	10.7807	34.87	V| Q	|	|	|
9+30	11.0263	35.66	V| Q	|	|	|
9+35	11.2773	36.44	V| Q	|	|	|
9+40	11.5353	37.47	V| Q	|	|	|
9+45	11.8023	38.77	V Q	|	|	|
9+50	12.0777	39.98	V Q	|	|	|
9+55	12.3616	41.23	V Q	|	|	|
10+ 0	12.6553	42.65	V Q	|	|	|
10+ 5	12.9520	43.08	|V Q	|	|	|
10+10	13.2343	40.99	|V Q	|	|	|
10+15	13.4889	36.96	|V Q	|	|	|
10+20	13.7220	33.85	|V Q	|	|	|
10+25	13.9448	32.35	| Q	|	|	|
10+30	14.1619	31.53	| Q	|	|	|
10+35	14.3782	31.40	| Q	|	|	|
10+40	14.6039	32.78	| VQ	|	|	|
10+45	14.8478	35.40	| V Q	|	|	|
10+50	15.1058	37.46	| VQ	|	|	|
10+55	15.3709	38.50	| V Q	|	|	|
11+ 0	15.6404	39.13	| V Q	|	|	|
11+ 5	15.9123	39.47	| V Q	|	|	|
11+10	16.1828	39.27	| VQ	|	|	|
11+15	16.4491	38.68	| VQ	|	|	|
11+20	16.7126	38.27	| VQ	|	|	|
11+25	16.9754	38.16	| VQ	|	|	|
11+30	17.2384	38.18	| VQ	|	|	|
11+35	17.5002	38.02	| Q	|	|	|
11+40	17.7559	37.13	| QV	|	|	|
11+45	18.0013	35.63	| QV	|	|	|
11+50	18.2391	34.54	| Q V	|	|	|
11+55	18.4765	34.47	| Q V	|	|	|
12+ 0	18.7172	34.95	| Q V	|	|	|
12+ 5	18.9678	36.39	| Q V	|	|	|
12+10	19.2480	40.68	| Q	|	|	|
12+15	19.5742	47.37	| V Q	|	|	|
12+20	19.9375	52.74	| V |Q	|	|	|
12+25	20.3233	56.02	| V | Q	|	|	|
12+30	20.7268	58.59	| V | Q	|	|	|
12+35	21.1459	60.86	| V | Q	|	|	|
12+40	21.5825	63.39	| V | Q	|	|	|
12+45	22.0389	66.28	| V| Q	|	|	|
12+50	22.5123	68.73	| V| Q	|	|	|
12+55	22.9997	70.77	| V| Q |	|	|	|
13+ 0	23.5006	72.74	| V Q|	|	|	|
13+ 5	24.0175	75.05	| V Q	|	|	|
13+10	24.5621	79.08	| |V |Q	|	|	|



17+25	43.0383	9.43	Q			V
17+30	43.1032	9.42	Q			V
17+35	43.1679	9.40	Q			V
17+40	43.2324	9.36	Q			V
17+45	43.2965	9.30	Q			V
17+50	43.3592	9.11	Q			V
17+55	43.4203	8.87	Q			V
18+ 0	43.4784	8.44	Q			V
18+ 5	43.5343	8.12	Q			V
18+10	43.5892	7.97	Q			V
18+15	43.6435	7.89	Q			V
18+20	43.6974	7.83	Q			V
18+25	43.7511	7.79	Q			V
18+30	43.8045	7.76	Q			V
18+35	43.8573	7.66	Q			V
18+40	43.9079	7.35	Q			V
18+45	43.9552	6.87	Q			V
18+50	43.9995	6.44	Q			V
18+55	44.0405	5.94	Q			V
19+ 0	44.0773	5.35	Q			V
19+ 5	44.1115	4.97	Q			V
19+10	44.1459	5.00	Q			V
19+15	44.1824	5.30	Q			V
19+20	44.2210	5.60	Q			V
19+25	44.2622	5.98	Q			V
19+30	44.3067	6.47	Q			V
19+35	44.3533	6.77	Q			V
19+40	44.3993	6.67	Q			V
19+45	44.4428	6.32	Q			V
19+50	44.4839	5.97	Q			V
19+55	44.5222	5.56	Q			V
20+ 0	44.5568	5.03	Q			V
20+ 5	44.5892	4.70	Q			V
20+10	44.6221	4.78	Q			V
20+15	44.6574	5.12	Q			V
20+20	44.6944	5.37	Q			V
20+25	44.7322	5.49	Q			V
20+30	44.7703	5.54	Q			V
20+35	44.8087	5.57	Q			V
20+40	44.8473	5.60	Q			V
20+45	44.8860	5.62	Q			V
20+50	44.9244	5.57	Q			V
20+55	44.9608	5.29	Q			V
21+ 0	44.9941	4.83	Q			V
21+ 5	45.0254	4.55	Q			V
21+10	45.0575	4.66	Q			V
21+15	45.0921	5.02	Q			V
21+20	45.1280	5.22	Q			V
21+25	45.1629	5.06	Q			V
21+30	45.1949	4.65	Q			V

```
21+35      45.2252      4.40  |Q        |         |         |         V|
21+40      45.2566      4.55  |Q        |         |         |         V|
21+45      45.2906      4.94  |Q        |         |         |         V|
21+50      45.3262      5.17  | Q       |         |         |         V|
21+55      45.3607      5.01  | Q       |         |         |         V|
22+ 0      45.3925      4.62  |Q        |         |         |         V|
22+ 5      45.4226      4.38  |Q        |         |         |         V|
22+10      45.4538      4.52  |Q        |         |         |         V|
22+15      45.4876      4.91  |Q        |         |         |         V|
22+20      45.5230      5.14  | Q       |         |         |         V|
22+25      45.5573      4.99  |Q        |         |         |         V|
22+30      45.5890      4.59  |Q        |         |         |         V|
22+35      45.6185      4.28  |Q        |         |         |         V|
22+40      45.6470      4.14  |Q        |         |         |         V|
22+45      45.6750      4.07  |Q        |         |         |         V|
22+50      45.7027      4.02  |Q        |         |         |         V|
22+55      45.7301      3.98  |Q        |         |         |         V|
23+ 0      45.7573      3.94  |Q        |         |         |         V|
23+ 5      45.7842      3.91  |Q        |         |         |         V|
23+10      45.8110      3.89  |Q        |         |         |         V|
23+15      45.8377      3.88  |Q        |         |         |         V|
23+20      45.8644      3.87  |Q        |         |         |         V|
23+25      45.8909      3.86  |Q        |         |         |         V|
23+30      45.9174      3.84  |Q        |         |         |         V|
23+35      45.9437      3.83  |Q        |         |         |         V|
23+40      45.9701      3.82  |Q        |         |         |         V|
23+45      45.9964      3.82  |Q        |         |         |         V|
23+50      46.0227      3.82  |Q        |         |         |         V|
23+55      46.0489      3.81  |Q        |         |         |         V|
24+ 0      46.0752      3.81  |Q        |         |         |         V|
24+ 5      46.1003      3.65  |Q        |         |         |         V|
24+10      46.1215      3.07  |Q        |         |         |         V|
24+15      46.1362      2.14  Q         |         |         |         V|
24+20      46.1460      1.42  Q         |         |         |         V|
24+25      46.1532      1.05  Q         |         |         |         V|
24+30      46.1589      0.83  Q         |         |         |         V|
24+35      46.1635      0.67  Q         |         |         |         V|
24+40      46.1673      0.55  Q         |         |         |         V|
24+45      46.1704      0.45  Q         |         |         |         V|
24+50      46.1729      0.37  Q         |         |         |         V|
24+55      46.1750      0.30  Q         |         |         |         V|
25+ 0      46.1767      0.25  Q         |         |         |         V|
25+ 5      46.1782      0.21  Q         |         |         |         V|
25+10      46.1793      0.17  Q         |         |         |         V|
25+15      46.1802      0.13  Q         |         |         |         V|
25+20      46.1810      0.11  Q         |         |         |         V|
25+25      46.1815      0.08  Q         |         |         |         V|
25+30      46.1820      0.06  Q         |         |         |         V|
25+35      46.1823      0.05  Q         |         |         |         V|
25+40      46.1825      0.03  Q         |         |         |         V|
```

```
   25+45      46.1826      0.02  Q         |         |         |        V|
----------------------------------------------------------------------------
```

EXISTING CONDITION OFFSITE EAST OF SHERMAN 100-YEAR, 1-HOUR UNIT HYDROGRAPH

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2018, Version 9.0
Study date 01/19/24 File: A11TRIB1000SERIES1100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6584

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

22-0198 - ETHANAC COMMERCE CENTER
OFFSITE UNIT HYDROGRAPH ANALYSIS
A-11 TRIBUTARY, 100-YEAR 24-HOUR
FN: A11TRIB1000SERIES.OUT- RSB

Drainage Area = 65.60(Ac.) = 0.102 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 65.60(Ac.) = 0.102 Sq. Mi.
Length along longest watercourse = 3208.00(Ft.)
Length along longest watercourse measured to centroid = 1567.00(Ft.)
Length along longest watercourse = 0.608 Mi.
Length along longest watercourse measured to centroid = 0.297 Mi.
Difference in elevation = 13.00(Ft.)
Slope along watercourse = 21.3965 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.210 Hr.
Lag time = 12.59 Min.
25% of lag time = 3.15 Min.
40% of lag time = 5.04 Min.
Unit time = 5.00 Min.
Duration of storm = 1 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
65.60	0.50	32.80

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]

```
       65.60           1.20                 78.72

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.500(In)
Area Averaged 100-Year Rainfall =    1.200(In)

Point rain (area averaged) =    1.200(In)
Areal adjustment factor =   99.94 %
Adjusted average point rain =    1.199(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    44.000           56.00          0.500
    21.600           75.00          0.500
 Total Area Entered =     65.60(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
56.0  56.0      0.511     0.500        0.281       0.671      0.188
75.0  75.0      0.303     0.500        0.167       0.329      0.055
                                                  Sum (F) =   0.243
Area averaged mean soil loss (F) (In/Hr) =  0.243
Minimum soil loss rate ((In/Hr)) =  0.122
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.500
------------------------------------------------------------------------
Slope of intensity-duration curve for a 1 hour storm =0.5000
------------------------------------------------------------------------

              U n i t  H y d r o g r a p h
                     VALLEY S-Curve
------------------------------------------------------------------
              Unit Hydrograph Data
------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                          Graph %            (CFS)
------------------------------------------------------------------
    1   0.083         39.715          4.310              2.849
    2   0.167         79.431         17.664             11.678
    3   0.250        119.146         26.597             17.584
    4   0.333        158.861         17.586             11.626
    5   0.417        198.577          8.605              5.689
    6   0.500        238.292          5.406              3.574
    7   0.583        278.007          4.028              2.663
    8   0.667        317.722          3.104              2.052
    9   0.750        357.438          2.445              1.616
   10   0.833        397.153          1.957              1.294
   11   0.917        436.868          1.542              1.020
   12   1.000        476.584          1.254              0.829
   13   1.083        516.299          1.169              0.773
   14   1.167        556.014          0.927              0.613
   15   1.250        595.730          0.772              0.510
   16   1.333        635.445          0.652              0.431
   17   1.417        675.160          0.525              0.347
   18   1.500        714.876          0.408              0.270
   19   1.583        754.591          0.397              0.263
```

```
          20   1.667        794.306          0.397              0.263
          21   1.750        834.021          0.256              0.169
                                      Sum = 100.000   Sum=      66.112
-----------------------------------------------------------------------
```

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	4.20	0.604	0.243	(0.302)	0.361
2	0.17	4.30	0.619	0.243	(0.309)	0.376
3	0.25	5.00	0.720	0.243	(0.360)	0.476
4	0.33	5.00	0.720	0.243	(0.360)	0.476
5	0.42	5.80	0.835	0.243	(0.417)	0.591
6	0.50	6.50	0.935	0.243	(0.468)	0.692
7	0.58	7.40	1.065	0.243	(0.532)	0.822
8	0.67	8.60	1.238	0.243	(0.619)	0.994
9	0.75	12.30	1.770	0.243	(0.885)	1.527
10	0.83	29.10	4.188	0.243	(2.094)	3.945
11	0.92	6.80	0.979	0.243	(0.489)	0.735
12	1.00	5.00	0.720	0.243	(0.360)	0.476
		(Loss Rate Not Used)				
Sum =		100.0			Sum =	11.5

```
   Flood volume = Effective rainfall      0.96(In)
    times area      65.6(Ac.)/[(In)/(Ft.)] =       5.2(Ac.Ft)
   Total soil loss =      0.24(In)
   Total soil loss =     1.330(Ac.Ft)
   Total rainfall =      1.20(In)
   Flood volume =      227645.3 Cubic Feet
   Total soil loss =       57938.4 Cubic Feet
   ---------------------------------------------------------------------
    Peak flow rate of this hydrograph =    110.832(CFS)
   ---------------------------------------------------------------------
   +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                      1 - 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   5   Minute intervals ((CFS))

   ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       50.0     100.0     150.0     200.0
---------------------------------------------------------------------------
  0+ 5       0.0071      1.03  Q         |         |         |         |
  0+10       0.0435      5.29  VQ        |         |         |         |
  0+15       0.1268     12.10  V Q       |         |         |         |
  0+20       0.2490     17.73  |V Q      |         |         |         |
  0+25       0.4008     22.05  |  VQ     |         |         |         |
  0+30       0.5815     26.23  |   VQ    |         |         |         |
  0+35       0.7977     31.39  |     Q   |         |         |         |
  0+40       1.0569     37.65  |      QV |         |         |         |
  0+45       1.3749     46.17  |        QV         |         |         |
  0+50       1.8261     65.51  |         |  Q      |         |         |
  0+55       2.5006     97.94  |         |        Q|         |         |
  1+ 0       3.2639    110.83  |         |         | Q V     |         |
  1+ 5       3.8348     82.89  |         |     Q   |        V|         |
```

```
   1+10       4.1961     52.46  |         Q         |         | V       |
   1+15       4.4299     33.95  |     Q   |         |         |  V      |
   1+20       4.5942     23.86  |   Q     |         |         |    V    |
   1+25       4.7197     18.21  |  Q      |         |         |     V   |
   1+30       4.8189     14.40  | Q       |         |         |     V   |
   1+35       4.8987     11.59  | Q       |         |         |      V  |
   1+40       4.9633      9.38  |Q        |         |         |      V  |
   1+45       5.0168      7.77  |Q        |         |         |       V |
   1+50       5.0626      6.66  |Q        |         |         |       V |
   1+55       5.1000      5.42  |Q        |         |         |        V|
   2+ 0       5.1308      4.48  Q         |         |         |        V|
   2+ 5       5.1560      3.66  Q         |         |         |        V|
   2+10       5.1763      2.94  Q         |         |         |        V|
   2+15       5.1923      2.33  Q         |         |         |        V|
   2+20       5.2058      1.97  Q         |         |         |        V|
   2+25       5.2170      1.62  Q         |         |         |        V|
   2+30       5.2237      0.98  Q         |         |         |        V|
   2+35       5.2255      0.25  Q         |         |         |        V|
   2+40       5.2260      0.08  Q         |         |         |         V
-------------------------------------------------------------------------
```

EXISTING CONDITION OFFSITE EAST OF SHERMAN 100-YEAR, 3-HOUR UNIT HYDROGRAPH

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2018, Version 9.0
Study date 01/19/24 File: A11TRIB1000SERIES3100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6584

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

22-0198 - ETHANAC COMMERCE CENTER
OFFSITE UNIT HYDROGRAPH ANALYSIS
A-11 TRIBUTARY, 100-YEAR 24-HOUR
FN: A11TRIB1000SERIES.OUT- RSB

Drainage Area = 65.60(Ac.) = 0.102 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 65.60(Ac.) = 0.102 Sq. Mi.
Length along longest watercourse = 3208.00(Ft.)
Length along longest watercourse measured to centroid = 1567.00(Ft.)
Length along longest watercourse = 0.608 Mi.
Length along longest watercourse measured to centroid = 0.297 Mi.
Difference in elevation = 13.00(Ft.)
Slope along watercourse = 21.3965 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.210 Hr.
Lag time = 12.59 Min.
25% of lag time = 3.15 Min.
40% of lag time = 5.04 Min.
Unit time = 5.00 Min.
Duration of storm = 3 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
65.60	0.80	52.48

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]

```
       65.60          1.90               124.64

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.800(In)
Area Averaged 100-Year Rainfall =    1.900(In)

Point rain (area averaged) =    1.900(In)
Areal adjustment factor =   99.97 %
Adjusted average point rain =    1.899(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    44.000           56.00         0.500
    21.600           75.00         0.500
 Total Area Entered =     65.60(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
56.0  56.0      0.511     0.500        0.281       0.671      0.188
75.0  75.0      0.303     0.500        0.167       0.329      0.055
                                                  Sum (F) =   0.243
Area averaged mean soil loss (F) (In/Hr) =  0.243
Minimum soil loss rate ((In/Hr)) =  0.122
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.500
------------------------------------------------------------------------

              U n i t  H y d r o g r a p h
                     VALLEY S-Curve
------------------------------------------------------------------------
              Unit Hydrograph Data
------------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                          Graph %           (CFS)
------------------------------------------------------------------------
    1   0.083         39.715          4.310             2.849
    2   0.167         79.431         17.664            11.678
    3   0.250        119.146         26.597            17.584
    4   0.333        158.861         17.586            11.626
    5   0.417        198.577          8.605             5.689
    6   0.500        238.292          5.406             3.574
    7   0.583        278.007          4.028             2.663
    8   0.667        317.722          3.104             2.052
    9   0.750        357.438          2.445             1.616
   10   0.833        397.153          1.957             1.294
   11   0.917        436.868          1.542             1.020
   12   1.000        476.584          1.254             0.829
   13   1.083        516.299          1.169             0.773
   14   1.167        556.014          0.927             0.613
   15   1.250        595.730          0.772             0.510
   16   1.333        635.445          0.652             0.431
   17   1.417        675.160          0.525             0.347
   18   1.500        714.876          0.408             0.270
   19   1.583        754.591          0.397             0.263
   20   1.667        794.306          0.397             0.263
   21   1.750        834.021          0.256             0.169
```

Sum = 100.000 Sum= 66.112

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	1.30	0.296	(0.243)	0.148	0.148
2	0.17	1.30	0.296	(0.243)	0.148	0.148
3	0.25	1.10	0.251	(0.243)	0.125	0.125
4	0.33	1.50	0.342	(0.243)	0.171	0.171
5	0.42	1.50	0.342	(0.243)	0.171	0.171
6	0.50	1.80	0.410	(0.243)	0.205	0.205
7	0.58	1.50	0.342	(0.243)	0.171	0.171
8	0.67	1.80	0.410	(0.243)	0.205	0.205
9	0.75	1.80	0.410	(0.243)	0.205	0.205
10	0.83	1.50	0.342	(0.243)	0.171	0.171
11	0.92	1.60	0.365	(0.243)	0.182	0.182
12	1.00	1.80	0.410	(0.243)	0.205	0.205
13	1.08	2.20	0.501	0.243	(0.251)	0.258
14	1.17	2.20	0.501	0.243	(0.251)	0.258
15	1.25	2.20	0.501	0.243	(0.251)	0.258
16	1.33	2.00	0.456	(0.243)	0.228	0.228
17	1.42	2.60	0.593	0.243	(0.296)	0.349
18	1.50	2.70	0.615	0.243	(0.308)	0.372
19	1.58	2.40	0.547	0.243	(0.274)	0.304
20	1.67	2.70	0.615	0.243	(0.308)	0.372
21	1.75	3.30	0.752	0.243	(0.376)	0.509
22	1.83	3.10	0.707	0.243	(0.353)	0.463
23	1.92	2.90	0.661	0.243	(0.331)	0.418
24	2.00	3.00	0.684	0.243	(0.342)	0.440
25	2.08	3.10	0.707	0.243	(0.353)	0.463
26	2.17	4.20	0.957	0.243	(0.479)	0.714
27	2.25	5.00	1.140	0.243	(0.570)	0.896
28	2.33	3.50	0.798	0.243	(0.399)	0.554
29	2.42	6.80	1.550	0.243	(0.775)	1.307
30	2.50	7.30	1.664	0.243	(0.832)	1.421
31	2.58	8.20	1.869	0.243	(0.935)	1.626
32	2.67	5.90	1.345	0.243	(0.672)	1.102
33	2.75	2.00	0.456	(0.243)	0.228	0.228
34	2.83	1.80	0.410	(0.243)	0.205	0.205
35	2.92	1.80	0.410	(0.243)	0.205	0.205
36	3.00	0.60	0.137	(0.243)	0.068	0.068
		(Loss Rate Not Used)				
	Sum =	100.0			Sum =	15.1

Flood volume = Effective rainfall 1.26(In)
times area 65.6(Ac.)/[(In)/(Ft.)] = 6.9(Ac.Ft)
Total soil loss = 0.64(In)
Total soil loss = 3.492(Ac.Ft)
Total rainfall = 1.90(In)
Flood volume = 300193.7 Cubic Feet
Total soil loss = 152119.7 Cubic Feet

Peak flow rate of this hydrograph = 75.350(CFS)

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3 - 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 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	20.0	40.0	60.0	80.0
0+ 5	0.0029	0.42	Q				
0+10	0.0177	2.15	VQ				
0+15	0.0501	4.69	V Q				
0+20	0.0933	6.28	V Q				
0+25	0.1433	7.26	V Q				
0+30	0.2013	8.42	V Q				
0+35	0.2669	9.52	V Q				
0+40	0.3378	10.30	V Q				
0+45	0.4124	10.84	V Q				
0+50	0.4910	11.41	V Q				
0+55	0.5707	11.57	V Q				
1+ 0	0.6499	11.50	V Q				
1+ 5	0.7323	11.97	VQ				
1+10	0.8227	13.12	V Q				
1+15	0.9220	14.42	V Q				
1+20	1.0264	15.16	V Q				
1+25	1.1338	15.60	VQ				
1+30	1.2500	16.86	VQ				
1+35	1.3805	18.95	VQ				
1+40	1.5195	20.18	V Q				
1+45	1.6652	21.17	VQ				
1+50	1.8279	23.62	VQ				
1+55	2.0083	26.19	V Q				
2+ 0	2.1942	26.99	VQ				
2+ 5	2.3807	27.09	Q				
2+10	2.5765	28.42	Q				
2+15	2.8015	32.67	Q				
2+20	3.0685	38.78	V Q				
2+25	3.3675	43.40	V Q				
2+30	3.7139	50.31	V Q				
2+35	4.1521	63.62	V Q				
2+40	4.6674	74.82	V Q				
2+45	5.1864	75.35	V Q				
2+50	5.6103	61.55	Q V				
2+55	5.9091	43.40	Q V				
3+ 0	6.1300	32.07	Q V				
3+ 5	6.3033	25.17	Q V				
3+10	6.4337	18.92	Q V				
3+15	6.5296	13.94	Q V				
3+20	6.6032	10.68	Q V				
3+25	6.6622	8.56	Q V				
3+30	6.7100	6.95	Q V				
3+35	6.7495	5.73	Q V				
3+40	6.7821	4.73	Q V				
3+45	6.8087	3.87	Q V				
3+50	6.8304	3.15	Q V				
3+55	6.8477	2.52	Q V				
4+ 0	6.8616	2.01	Q V				

```
    4+ 5       6.8729      1.63  Q         |         |         |        V|
    4+10       6.8812      1.21  Q         |         |         |        V|
    4+15       6.8866      0.78  Q         |         |         |        V|
    4+20       6.8892      0.38  Q         |         |         |        V|
    4+25       6.8903      0.16  Q         |         |         |        V|
    4+30       6.8911      0.11  Q         |         |         |        V|
    4+35       6.8914      0.05  Q         |         |         |        V|
    4+40       6.8915      0.01  Q         |         |         |        V|
---------------------------------------------------------------------------
```

EXISTING CONDITION OFFSITE EAST OF SHERMAN 100-YEAR, 6-HOUR UNIT HYDROGRAPH

U n i t H y d r o g r a p h A n a l y s i s

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Study date 01/19/24 File: A11TRIB1000SERIES6100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6584

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

22-0198 - ETHANAC COMMERCE CENTER
OFFSITE UNIT HYDROGRAPH ANALYSIS
A-11 TRIBUTARY, 100-YEAR 24-HOUR
FN: A11TRIB1000SERIES.OUT- RSB

Drainage Area = 65.60(Ac.) = 0.102 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 65.60(Ac.) = 0.102 Sq. Mi.
Length along longest watercourse = 3208.00(Ft.)
Length along longest watercourse measured to centroid = 1567.00(Ft.)
Length along longest watercourse = 0.608 Mi.
Length along longest watercourse measured to centroid = 0.297 Mi.
Difference in elevation = 13.00(Ft.)
Slope along watercourse = 21.3965 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.210 Hr.
Lag time = 12.59 Min.
25% of lag time = 3.15 Min.
40% of lag time = 5.04 Min.
Unit time = 5.00 Min.
Duration of storm = 6 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
65.60	1.00	65.60

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]

```
       65.60           2.50                164.00

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.000(In)
Area Averaged 100-Year Rainfall =    2.500(In)

Point rain (area averaged) =    2.500(In)
Areal adjustment factor =   99.98 %
Adjusted average point rain =    2.499(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    44.000           56.00         0.500
    21.600           75.00         0.500
 Total Area Entered =     65.60(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
56.0  56.0      0.511     0.500        0.281       0.671      0.188
75.0  75.0      0.303     0.500        0.167       0.329      0.055
                                                  Sum (F) =   0.243
Area averaged mean soil loss (F) (In/Hr) =  0.243
Minimum soil loss rate ((In/Hr)) =  0.122
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.500
------------------------------------------------------------------------

              U n i t  H y d r o g r a p h
                     VALLEY S-Curve
------------------------------------------------------------------------
              Unit Hydrograph Data
------------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                          Graph %           (CFS)
------------------------------------------------------------------------
    1   0.083         39.715          4.310             2.849
    2   0.167         79.431         17.664            11.678
    3   0.250        119.146         26.597            17.584
    4   0.333        158.861         17.586            11.626
    5   0.417        198.577          8.605             5.689
    6   0.500        238.292          5.406             3.574
    7   0.583        278.007          4.028             2.663
    8   0.667        317.722          3.104             2.052
    9   0.750        357.438          2.445             1.616
   10   0.833        397.153          1.957             1.294
   11   0.917        436.868          1.542             1.020
   12   1.000        476.584          1.254             0.829
   13   1.083        516.299          1.169             0.773
   14   1.167        556.014          0.927             0.613
   15   1.250        595.730          0.772             0.510
   16   1.333        635.445          0.652             0.431
   17   1.417        675.160          0.525             0.347
   18   1.500        714.876          0.408             0.270
   19   1.583        754.591          0.397             0.263
   20   1.667        794.306          0.397             0.263
   21   1.750        834.021          0.256             0.169
```

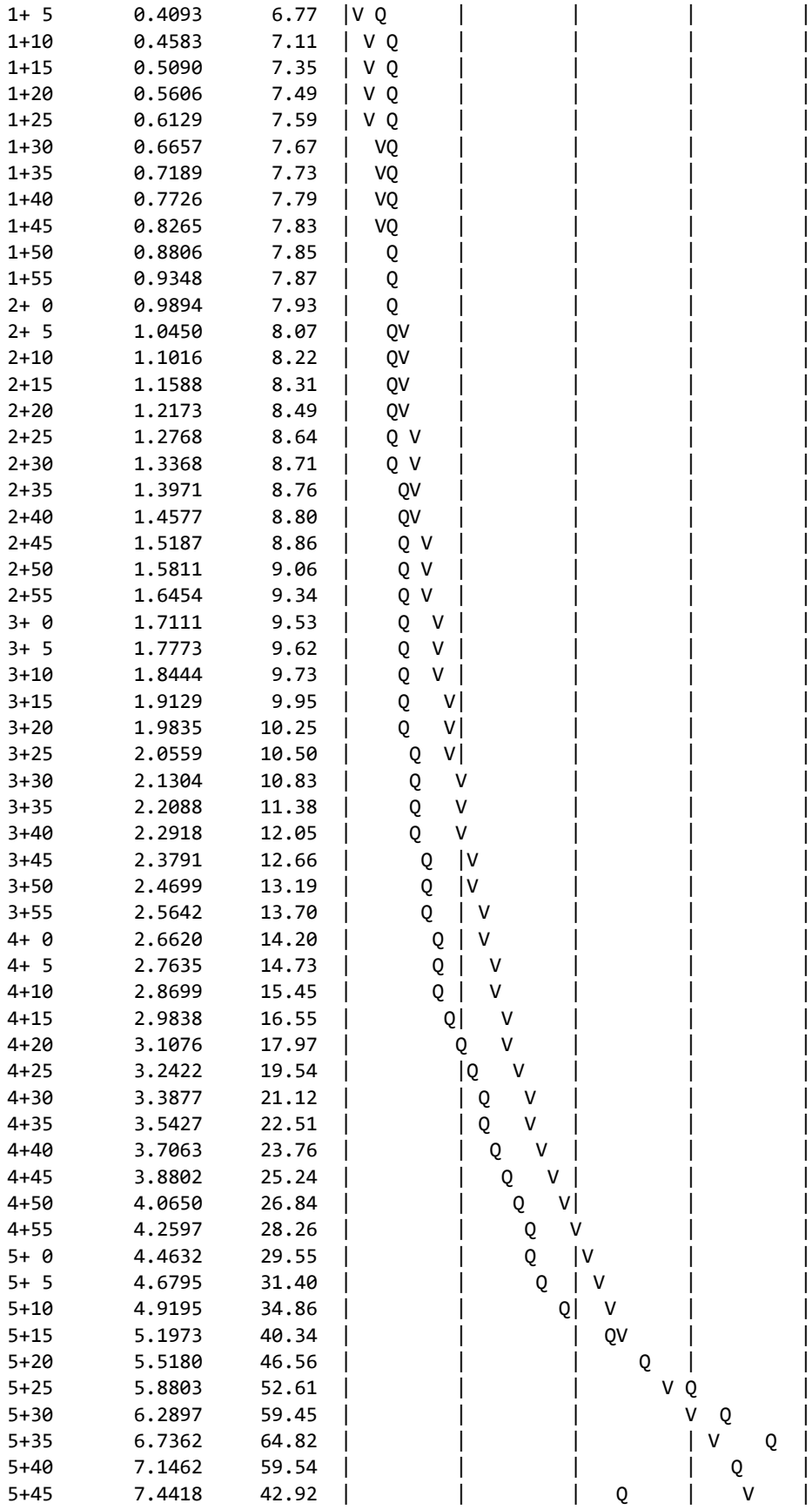
Sum = 100.000 Sum= 66.112

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.50	0.150	(0.243)	0.075	0.075
2	0.17	0.60	0.180	(0.243)	0.090	0.090
3	0.25	0.60	0.180	(0.243)	0.090	0.090
4	0.33	0.60	0.180	(0.243)	0.090	0.090
5	0.42	0.60	0.180	(0.243)	0.090	0.090
6	0.50	0.70	0.210	(0.243)	0.105	0.105
7	0.58	0.70	0.210	(0.243)	0.105	0.105
8	0.67	0.70	0.210	(0.243)	0.105	0.105
9	0.75	0.70	0.210	(0.243)	0.105	0.105
10	0.83	0.70	0.210	(0.243)	0.105	0.105
11	0.92	0.70	0.210	(0.243)	0.105	0.105
12	1.00	0.80	0.240	(0.243)	0.120	0.120
13	1.08	0.80	0.240	(0.243)	0.120	0.120
14	1.17	0.80	0.240	(0.243)	0.120	0.120
15	1.25	0.80	0.240	(0.243)	0.120	0.120
16	1.33	0.80	0.240	(0.243)	0.120	0.120
17	1.42	0.80	0.240	(0.243)	0.120	0.120
18	1.50	0.80	0.240	(0.243)	0.120	0.120
19	1.58	0.80	0.240	(0.243)	0.120	0.120
20	1.67	0.80	0.240	(0.243)	0.120	0.120
21	1.75	0.80	0.240	(0.243)	0.120	0.120
22	1.83	0.80	0.240	(0.243)	0.120	0.120
23	1.92	0.80	0.240	(0.243)	0.120	0.120
24	2.00	0.90	0.270	(0.243)	0.135	0.135
25	2.08	0.80	0.240	(0.243)	0.120	0.120
26	2.17	0.90	0.270	(0.243)	0.135	0.135
27	2.25	0.90	0.270	(0.243)	0.135	0.135
28	2.33	0.90	0.270	(0.243)	0.135	0.135
29	2.42	0.90	0.270	(0.243)	0.135	0.135
30	2.50	0.90	0.270	(0.243)	0.135	0.135
31	2.58	0.90	0.270	(0.243)	0.135	0.135
32	2.67	0.90	0.270	(0.243)	0.135	0.135
33	2.75	1.00	0.300	(0.243)	0.150	0.150
34	2.83	1.00	0.300	(0.243)	0.150	0.150
35	2.92	1.00	0.300	(0.243)	0.150	0.150
36	3.00	1.00	0.300	(0.243)	0.150	0.150
37	3.08	1.00	0.300	(0.243)	0.150	0.150
38	3.17	1.10	0.330	(0.243)	0.165	0.165
39	3.25	1.10	0.330	(0.243)	0.165	0.165
40	3.33	1.10	0.330	(0.243)	0.165	0.165
41	3.42	1.20	0.360	(0.243)	0.180	0.180
42	3.50	1.30	0.390	(0.243)	0.195	0.195
43	3.58	1.40	0.420	(0.243)	0.210	0.210
44	3.67	1.40	0.420	(0.243)	0.210	0.210
45	3.75	1.50	0.450	(0.243)	0.225	0.225
46	3.83	1.50	0.450	(0.243)	0.225	0.225
47	3.92	1.60	0.480	(0.243)	0.240	0.240
48	4.00	1.60	0.480	(0.243)	0.240	0.240

```
49   4.08     1.70      0.510          0.243    (  0.255)        0.267
50   4.17     1.80      0.540          0.243    (  0.270)        0.297
51   4.25     1.90      0.570          0.243    (  0.285)        0.327
52   4.33     2.00      0.600          0.243    (  0.300)        0.357
53   4.42     2.10      0.630          0.243    (  0.315)        0.387
54   4.50     2.10      0.630          0.243    (  0.315)        0.387
55   4.58     2.20      0.660          0.243    (  0.330)        0.417
56   4.67     2.30      0.690          0.243    (  0.345)        0.447
57   4.75     2.40      0.720          0.243    (  0.360)        0.477
58   4.83     2.40      0.720          0.243    (  0.360)        0.477
59   4.92     2.50      0.750          0.243    (  0.375)        0.507
60   5.00     2.60      0.780          0.243    (  0.390)        0.537
61   5.08     3.10      0.930          0.243    (  0.465)        0.686
62   5.17     3.60      1.080          0.243    (  0.540)        0.836
63   5.25     3.90      1.170          0.243    (  0.585)        0.926
64   5.33     4.20      1.260          0.243    (  0.630)        1.016
65   5.42     4.70      1.410          0.243    (  0.705)        1.166
66   5.50     5.60      1.680          0.243    (  0.840)        1.436
67   5.58     1.90      0.570          0.243    (  0.285)        0.327
68   5.67     0.90      0.270       (  0.243)       0.135        0.135
69   5.75     0.60      0.180       (  0.243)       0.090        0.090
70   5.83     0.50      0.150       (  0.243)       0.075        0.075
71   5.92     0.30      0.090       (  0.243)       0.045        0.045
72   6.00     0.20      0.060       (  0.243)       0.030        0.030
              (Loss Rate Not Used)
   Sum =     100.0                                    Sum =    18.3
     Flood volume = Effective rainfall      1.53(In)
      times area      65.6(Ac.)/[(In)/(Ft.)] =       8.3(Ac.Ft)
     Total soil loss =      0.97(In)
     Total soil loss =     5.317(Ac.Ft)
     Total rainfall =      2.50(In)
     Flood volume =      363581.3 Cubic Feet
     Total soil loss =      231604.5 Cubic Feet
     ---------------------------------------------------------------------
      Peak flow rate of this hydrograph =     64.821(CFS)
     ---------------------------------------------------------------------
     +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                         6 - 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   5   Minute intervals ((CFS))

     ---------------------------------------------------------------------
Time(h+m) Volume Ac.Ft   Q(CFS)  0       17.5      35.0      52.5      70.0
-------------------------------------------------------------------------
  0+ 5       0.0015      0.21  Q        |         |         |         |
  0+10       0.0093      1.13  Q        |         |         |         |
  0+15       0.0274      2.63  VQ       |         |         |         |
  0+20       0.0533      3.76  V Q      |         |         |         |
  0+25       0.0833      4.36  V Q      |         |         |         |
  0+30       0.1161      4.76  V Q      |         |         |         |
  0+35       0.1519      5.19  V Q      |         |         |         |
  0+40       0.1908      5.65  V  Q     |         |         |         |
  0+45       0.2319      5.97  |V Q     |         |         |         |
  0+50       0.2745      6.18  |V Q     |         |         |         |
  0+55       0.3180      6.33  |V Q     |         |         |         |
  1+ 0       0.3627      6.49  |V Q     |         |         |         |
```



```
   5+50       7.6425     29.14  |         |     Q   |         |     V   |
   5+55       7.7919     21.69  |         | Q       |         |      V  |
   6+ 0       7.9097     17.11  |        Q|         |         |      V  |
   6+ 5       8.0031     13.56  |      Q  |         |         |       V |
   6+10       8.0762     10.61  |     Q   |         |         |       V |
   6+15       8.1329      8.24  |   Q     |         |         |       V |
   6+20       8.1778      6.52  |  Q      |         |         |        V|
   6+25       8.2144      5.31  |  Q      |         |         |        V|
   6+30       8.2446      4.39  | Q       |         |         |        V|
   6+35       8.2691      3.56  | Q       |         |         |        V|
   6+40       8.2890      2.89  |Q        |         |         |        V|
   6+45       8.3052      2.34  |Q        |         |         |        V|
   6+50       8.3180      1.86  |Q        |         |         |        V|
   6+55       8.3279      1.44  Q         |         |         |        V|
   7+ 0       8.3356      1.12  Q         |         |         |        V|
   7+ 5       8.3411      0.80  Q         |         |         |        V|
   7+10       8.3442      0.45  Q         |         |         |        V|
   7+15       8.3453      0.16  Q         |         |         |        V|
   7+20       8.3459      0.09  Q         |         |         |        V|
   7+25       8.3463      0.05  Q         |         |         |        V|
   7+30       8.3465      0.03  Q         |         |         |        V|
   7+35       8.3466      0.02  Q         |         |         |        V|
   7+40       8.3467      0.01  Q         |         |         |        V|
-------------------------------------------------------------------------
```

EXISTING CONDITION OFFSITE EAST OF SHERMAN 100-YEAR, 24-HOUR UNIT HYDROGRAPH

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2018, Version 9.0
Study date 01/19/24 File: A11TRIB1000SERIES24100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 6584

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

22-0198 - ETHANAC COMMERCE CENTER
OFFSITE UNIT HYDROGRAPH ANALYSIS
A-11 TRIBUTARY, 100-YEAR 24-HOUR
FN: A11TRIB1000SERIES.OUT- RSB

Drainage Area = 65.60(Ac.) = 0.102 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 65.60(Ac.) = 0.102 Sq. Mi.
Length along longest watercourse = 3208.00(Ft.)
Length along longest watercourse measured to centroid = 1567.00(Ft.)
Length along longest watercourse = 0.608 Mi.
Length along longest watercourse measured to centroid = 0.297 Mi.
Difference in elevation = 13.00(Ft.)
Slope along watercourse = 21.3965 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.210 Hr.
Lag time = 12.59 Min.
25% of lag time = 3.15 Min.
40% of lag time = 5.04 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
65.60	1.60	104.96

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]

65.60 4.00 262.40

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.600(In)
Area Averaged 100-Year Rainfall = 4.000(In)

Point rain (area averaged) = 4.000(In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 3.999(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
44.000	56.00	0.500
21.600	75.00	0.500

Total Area Entered = 65.60(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
56.0	56.0	0.511	0.500	0.281	0.671	0.188
75.0	75.0	0.303	0.500	0.167	0.329	0.055
					Sum (F) =	0.243

Area averaged mean soil loss (F) (In/Hr) = 0.243
Minimum soil loss rate ((In/Hr)) = 0.122
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.500

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	39.715	4.310	2.849
2	0.167	79.431	17.664	11.678
3	0.250	119.146	26.597	17.584
4	0.333	158.861	17.586	11.626
5	0.417	198.577	8.605	5.689
6	0.500	238.292	5.406	3.574
7	0.583	278.007	4.028	2.663
8	0.667	317.722	3.104	2.052
9	0.750	357.438	2.445	1.616
10	0.833	397.153	1.957	1.294
11	0.917	436.868	1.542	1.020
12	1.000	476.584	1.254	0.829
13	1.083	516.299	1.169	0.773
14	1.167	556.014	0.927	0.613
15	1.250	595.730	0.772	0.510
16	1.333	635.445	0.652	0.431
17	1.417	675.160	0.525	0.347
18	1.500	714.876	0.408	0.270
19	1.583	754.591	0.397	0.263
20	1.667	794.306	0.397	0.263
21	1.750	834.021	0.256	0.169

Sum = 100.000 Sum= 66.112

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.032	(0.431)	0.016	0.016
2	0.17	0.07	0.032	(0.430)	0.016	0.016
3	0.25	0.07	0.032	(0.428)	0.016	0.016
4	0.33	0.10	0.048	(0.426)	0.024	0.024
5	0.42	0.10	0.048	(0.425)	0.024	0.024
6	0.50	0.10	0.048	(0.423)	0.024	0.024
7	0.58	0.10	0.048	(0.421)	0.024	0.024
8	0.67	0.10	0.048	(0.420)	0.024	0.024
9	0.75	0.10	0.048	(0.418)	0.024	0.024
10	0.83	0.13	0.064	(0.416)	0.032	0.032
11	0.92	0.13	0.064	(0.415)	0.032	0.032
12	1.00	0.13	0.064	(0.413)	0.032	0.032
13	1.08	0.10	0.048	(0.412)	0.024	0.024
14	1.17	0.10	0.048	(0.410)	0.024	0.024
15	1.25	0.10	0.048	(0.408)	0.024	0.024
16	1.33	0.10	0.048	(0.407)	0.024	0.024
17	1.42	0.10	0.048	(0.405)	0.024	0.024
18	1.50	0.10	0.048	(0.403)	0.024	0.024
19	1.58	0.10	0.048	(0.402)	0.024	0.024
20	1.67	0.10	0.048	(0.400)	0.024	0.024
21	1.75	0.10	0.048	(0.399)	0.024	0.024
22	1.83	0.13	0.064	(0.397)	0.032	0.032
23	1.92	0.13	0.064	(0.395)	0.032	0.032
24	2.00	0.13	0.064	(0.394)	0.032	0.032
25	2.08	0.13	0.064	(0.392)	0.032	0.032
26	2.17	0.13	0.064	(0.391)	0.032	0.032
27	2.25	0.13	0.064	(0.389)	0.032	0.032
28	2.33	0.13	0.064	(0.387)	0.032	0.032
29	2.42	0.13	0.064	(0.386)	0.032	0.032
30	2.50	0.13	0.064	(0.384)	0.032	0.032
31	2.58	0.17	0.080	(0.383)	0.040	0.040
32	2.67	0.17	0.080	(0.381)	0.040	0.040
33	2.75	0.17	0.080	(0.380)	0.040	0.040
34	2.83	0.17	0.080	(0.378)	0.040	0.040
35	2.92	0.17	0.080	(0.376)	0.040	0.040
36	3.00	0.17	0.080	(0.375)	0.040	0.040
37	3.08	0.17	0.080	(0.373)	0.040	0.040
38	3.17	0.17	0.080	(0.372)	0.040	0.040
39	3.25	0.17	0.080	(0.370)	0.040	0.040
40	3.33	0.17	0.080	(0.369)	0.040	0.040
41	3.42	0.17	0.080	(0.367)	0.040	0.040
42	3.50	0.17	0.080	(0.366)	0.040	0.040
43	3.58	0.17	0.080	(0.364)	0.040	0.040
44	3.67	0.17	0.080	(0.363)	0.040	0.040
45	3.75	0.17	0.080	(0.361)	0.040	0.040
46	3.83	0.20	0.096	(0.360)	0.048	0.048
47	3.92	0.20	0.096	(0.358)	0.048	0.048
48	4.00	0.20	0.096	(0.356)	0.048	0.048

49	4.08	0.20	0.096	(0.355)	0.048	0.048
50	4.17	0.20	0.096	(0.353)	0.048	0.048
51	4.25	0.20	0.096	(0.352)	0.048	0.048
52	4.33	0.23	0.112	(0.350)	0.056	0.056
53	4.42	0.23	0.112	(0.349)	0.056	0.056
54	4.50	0.23	0.112	(0.347)	0.056	0.056
55	4.58	0.23	0.112	(0.346)	0.056	0.056
56	4.67	0.23	0.112	(0.344)	0.056	0.056
57	4.75	0.23	0.112	(0.343)	0.056	0.056
58	4.83	0.27	0.128	(0.342)	0.064	0.064
59	4.92	0.27	0.128	(0.340)	0.064	0.064
60	5.00	0.27	0.128	(0.339)	0.064	0.064
61	5.08	0.20	0.096	(0.337)	0.048	0.048
62	5.17	0.20	0.096	(0.336)	0.048	0.048
63	5.25	0.20	0.096	(0.334)	0.048	0.048
64	5.33	0.23	0.112	(0.333)	0.056	0.056
65	5.42	0.23	0.112	(0.331)	0.056	0.056
66	5.50	0.23	0.112	(0.330)	0.056	0.056
67	5.58	0.27	0.128	(0.328)	0.064	0.064
68	5.67	0.27	0.128	(0.327)	0.064	0.064
69	5.75	0.27	0.128	(0.325)	0.064	0.064
70	5.83	0.27	0.128	(0.324)	0.064	0.064
71	5.92	0.27	0.128	(0.323)	0.064	0.064
72	6.00	0.27	0.128	(0.321)	0.064	0.064
73	6.08	0.30	0.144	(0.320)	0.072	0.072
74	6.17	0.30	0.144	(0.318)	0.072	0.072
75	6.25	0.30	0.144	(0.317)	0.072	0.072
76	6.33	0.30	0.144	(0.315)	0.072	0.072
77	6.42	0.30	0.144	(0.314)	0.072	0.072
78	6.50	0.30	0.144	(0.313)	0.072	0.072
79	6.58	0.33	0.160	(0.311)	0.080	0.080
80	6.67	0.33	0.160	(0.310)	0.080	0.080
81	6.75	0.33	0.160	(0.308)	0.080	0.080
82	6.83	0.33	0.160	(0.307)	0.080	0.080
83	6.92	0.33	0.160	(0.306)	0.080	0.080
84	7.00	0.33	0.160	(0.304)	0.080	0.080
85	7.08	0.33	0.160	(0.303)	0.080	0.080
86	7.17	0.33	0.160	(0.302)	0.080	0.080
87	7.25	0.33	0.160	(0.300)	0.080	0.080
88	7.33	0.37	0.176	(0.299)	0.088	0.088
89	7.42	0.37	0.176	(0.297)	0.088	0.088
90	7.50	0.37	0.176	(0.296)	0.088	0.088
91	7.58	0.40	0.192	(0.295)	0.096	0.096
92	7.67	0.40	0.192	(0.293)	0.096	0.096
93	7.75	0.40	0.192	(0.292)	0.096	0.096
94	7.83	0.43	0.208	(0.291)	0.104	0.104
95	7.92	0.43	0.208	(0.289)	0.104	0.104
96	8.00	0.43	0.208	(0.288)	0.104	0.104
97	8.08	0.50	0.240	(0.287)	0.120	0.120
98	8.17	0.50	0.240	(0.285)	0.120	0.120
99	8.25	0.50	0.240	(0.284)	0.120	0.120
100	8.33	0.50	0.240	(0.283)	0.120	0.120
101	8.42	0.50	0.240	(0.281)	0.120	0.120
102	8.50	0.50	0.240	(0.280)	0.120	0.120
103	8.58	0.53	0.256	(0.279)	0.128	0.128
104	8.67	0.53	0.256	(0.277)	0.128	0.128
105	8.75	0.53	0.256	(0.276)	0.128	0.128

106	8.83	0.57	0.272	(	0.275)	0.136	0.136
107	8.92	0.57	0.272	(	0.273)	0.136	0.136
108	9.00	0.57	0.272	(	0.272)	0.136	0.136
109	9.08	0.63	0.304	(	0.271)	0.152	0.152
110	9.17	0.63	0.304	(	0.270)	0.152	0.152
111	9.25	0.63	0.304	(	0.268)	0.152	0.152
112	9.33	0.67	0.320	(	0.267)	0.160	0.160
113	9.42	0.67	0.320	(	0.266)	0.160	0.160
114	9.50	0.67	0.320	(	0.264)	0.160	0.160
115	9.58	0.70	0.336	(	0.263)	0.168	0.168
116	9.67	0.70	0.336	(	0.262)	0.168	0.168
117	9.75	0.70	0.336	(	0.261)	0.168	0.168
118	9.83	0.73	0.352	(	0.259)	0.176	0.176
119	9.92	0.73	0.352	(	0.258)	0.176	0.176
120	10.00	0.73	0.352	(	0.257)	0.176	0.176
121	10.08	0.50	0.240	(	0.256)	0.120	0.120
122	10.17	0.50	0.240	(	0.254)	0.120	0.120
123	10.25	0.50	0.240	(	0.253)	0.120	0.120
124	10.33	0.50	0.240	(	0.252)	0.120	0.120
125	10.42	0.50	0.240	(	0.251)	0.120	0.120
126	10.50	0.50	0.240	(	0.250)	0.120	0.120
127	10.58	0.67	0.320	(	0.248)	0.160	0.160
128	10.67	0.67	0.320	(	0.247)	0.160	0.160
129	10.75	0.67	0.320	(	0.246)	0.160	0.160
130	10.83	0.67	0.320	(	0.245)	0.160	0.160
131	10.92	0.67	0.320	(	0.243)	0.160	0.160
132	11.00	0.67	0.320	(	0.242)	0.160	0.160
133	11.08	0.63	0.304	(	0.241)	0.152	0.152
134	11.17	0.63	0.304	(	0.240)	0.152	0.152
135	11.25	0.63	0.304	(	0.239)	0.152	0.152
136	11.33	0.63	0.304	(	0.238)	0.152	0.152
137	11.42	0.63	0.304	(	0.236)	0.152	0.152
138	11.50	0.63	0.304	(	0.235)	0.152	0.152
139	11.58	0.57	0.272	(	0.234)	0.136	0.136
140	11.67	0.57	0.272	(	0.233)	0.136	0.136
141	11.75	0.57	0.272	(	0.232)	0.136	0.136
142	11.83	0.60	0.288	(	0.231)	0.144	0.144
143	11.92	0.60	0.288	(	0.229)	0.144	0.144
144	12.00	0.60	0.288	(	0.228)	0.144	0.144
145	12.08	0.83	0.400	(	0.227)	0.200	0.200
146	12.17	0.83	0.400	(	0.226)	0.200	0.200
147	12.25	0.83	0.400	(	0.225)	0.200	0.200
148	12.33	0.87	0.416	(	0.224)	0.208	0.208
149	12.42	0.87	0.416	(	0.223)	0.208	0.208
150	12.50	0.87	0.416	(	0.221)	0.208	0.208
151	12.58	0.93	0.448		0.220	(0.224)	0.228
152	12.67	0.93	0.448		0.219	(0.224)	0.229
153	12.75	0.93	0.448		0.218	(0.224)	0.230
154	12.83	0.97	0.464		0.217	(0.232)	0.247
155	12.92	0.97	0.464		0.216	(0.232)	0.248
156	13.00	0.97	0.464		0.215	(0.232)	0.249
157	13.08	1.13	0.544		0.214	(0.272)	0.330
158	13.17	1.13	0.544		0.213	(0.272)	0.331
159	13.25	1.13	0.544		0.212	(0.272)	0.332
160	13.33	1.13	0.544		0.211	(0.272)	0.333
161	13.42	1.13	0.544		0.209	(0.272)	0.334
162	13.50	1.13	0.544		0.208	(0.272)	0.336

163	13.58	0.77	0.368	(0.207)	0.184	0.184
164	13.67	0.77	0.368	(0.206)	0.184	0.184
165	13.75	0.77	0.368	(0.205)	0.184	0.184
166	13.83	0.77	0.368	(0.204)	0.184	0.184
167	13.92	0.77	0.368	(0.203)	0.184	0.184
168	14.00	0.77	0.368	(0.202)	0.184	0.184
169	14.08	0.90	0.432	0.201	(0.216)	0.231
170	14.17	0.90	0.432	0.200	(0.216)	0.232
171	14.25	0.90	0.432	0.199	(0.216)	0.233
172	14.33	0.87	0.416	0.198	(0.208)	0.218
173	14.42	0.87	0.416	0.197	(0.208)	0.219
174	14.50	0.87	0.416	0.196	(0.208)	0.220
175	14.58	0.87	0.416	0.195	(0.208)	0.221
176	14.67	0.87	0.416	0.194	(0.208)	0.222
177	14.75	0.87	0.416	0.193	(0.208)	0.223
178	14.83	0.83	0.400	0.192	(0.200)	0.208
179	14.92	0.83	0.400	0.191	(0.200)	0.209
180	15.00	0.83	0.400	0.190	(0.200)	0.210
181	15.08	0.80	0.384	0.189	(0.192)	0.195
182	15.17	0.80	0.384	0.188	(0.192)	0.196
183	15.25	0.80	0.384	0.187	(0.192)	0.197
184	15.33	0.77	0.368	(0.186)	0.184	0.184
185	15.42	0.77	0.368	(0.185)	0.184	0.184
186	15.50	0.77	0.368	(0.184)	0.184	0.184
187	15.58	0.63	0.304	(0.183)	0.152	0.152
188	15.67	0.63	0.304	(0.182)	0.152	0.152
189	15.75	0.63	0.304	(0.181)	0.152	0.152
190	15.83	0.63	0.304	(0.181)	0.152	0.152
191	15.92	0.63	0.304	(0.180)	0.152	0.152
192	16.00	0.63	0.304	(0.179)	0.152	0.152
193	16.08	0.13	0.064	(0.178)	0.032	0.032
194	16.17	0.13	0.064	(0.177)	0.032	0.032
195	16.25	0.13	0.064	(0.176)	0.032	0.032
196	16.33	0.13	0.064	(0.175)	0.032	0.032
197	16.42	0.13	0.064	(0.174)	0.032	0.032
198	16.50	0.13	0.064	(0.173)	0.032	0.032
199	16.58	0.10	0.048	(0.172)	0.024	0.024
200	16.67	0.10	0.048	(0.172)	0.024	0.024
201	16.75	0.10	0.048	(0.171)	0.024	0.024
202	16.83	0.10	0.048	(0.170)	0.024	0.024
203	16.92	0.10	0.048	(0.169)	0.024	0.024
204	17.00	0.10	0.048	(0.168)	0.024	0.024
205	17.08	0.17	0.080	(0.167)	0.040	0.040
206	17.17	0.17	0.080	(0.166)	0.040	0.040
207	17.25	0.17	0.080	(0.166)	0.040	0.040
208	17.33	0.17	0.080	(0.165)	0.040	0.040
209	17.42	0.17	0.080	(0.164)	0.040	0.040
210	17.50	0.17	0.080	(0.163)	0.040	0.040
211	17.58	0.17	0.080	(0.162)	0.040	0.040
212	17.67	0.17	0.080	(0.161)	0.040	0.040
213	17.75	0.17	0.080	(0.161)	0.040	0.040
214	17.83	0.13	0.064	(0.160)	0.032	0.032
215	17.92	0.13	0.064	(0.159)	0.032	0.032
216	18.00	0.13	0.064	(0.158)	0.032	0.032
217	18.08	0.13	0.064	(0.157)	0.032	0.032
218	18.17	0.13	0.064	(0.157)	0.032	0.032
219	18.25	0.13	0.064	(0.156)	0.032	0.032

220	18.33	0.13	0.064	(0.155)	0.032	0.032
221	18.42	0.13	0.064	(0.154)	0.032	0.032
222	18.50	0.13	0.064	(0.154)	0.032	0.032
223	18.58	0.10	0.048	(0.153)	0.024	0.024
224	18.67	0.10	0.048	(0.152)	0.024	0.024
225	18.75	0.10	0.048	(0.151)	0.024	0.024
226	18.83	0.07	0.032	(0.151)	0.016	0.016
227	18.92	0.07	0.032	(0.150)	0.016	0.016
228	19.00	0.07	0.032	(0.149)	0.016	0.016
229	19.08	0.10	0.048	(0.149)	0.024	0.024
230	19.17	0.10	0.048	(0.148)	0.024	0.024
231	19.25	0.10	0.048	(0.147)	0.024	0.024
232	19.33	0.13	0.064	(0.147)	0.032	0.032
233	19.42	0.13	0.064	(0.146)	0.032	0.032
234	19.50	0.13	0.064	(0.145)	0.032	0.032
235	19.58	0.10	0.048	(0.145)	0.024	0.024
236	19.67	0.10	0.048	(0.144)	0.024	0.024
237	19.75	0.10	0.048	(0.143)	0.024	0.024
238	19.83	0.07	0.032	(0.143)	0.016	0.016
239	19.92	0.07	0.032	(0.142)	0.016	0.016
240	20.00	0.07	0.032	(0.141)	0.016	0.016
241	20.08	0.10	0.048	(0.141)	0.024	0.024
242	20.17	0.10	0.048	(0.140)	0.024	0.024
243	20.25	0.10	0.048	(0.139)	0.024	0.024
244	20.33	0.10	0.048	(0.139)	0.024	0.024
245	20.42	0.10	0.048	(0.138)	0.024	0.024
246	20.50	0.10	0.048	(0.138)	0.024	0.024
247	20.58	0.10	0.048	(0.137)	0.024	0.024
248	20.67	0.10	0.048	(0.136)	0.024	0.024
249	20.75	0.10	0.048	(0.136)	0.024	0.024
250	20.83	0.07	0.032	(0.135)	0.016	0.016
251	20.92	0.07	0.032	(0.135)	0.016	0.016
252	21.00	0.07	0.032	(0.134)	0.016	0.016
253	21.08	0.10	0.048	(0.134)	0.024	0.024
254	21.17	0.10	0.048	(0.133)	0.024	0.024
255	21.25	0.10	0.048	(0.133)	0.024	0.024
256	21.33	0.07	0.032	(0.132)	0.016	0.016
257	21.42	0.07	0.032	(0.132)	0.016	0.016
258	21.50	0.07	0.032	(0.131)	0.016	0.016
259	21.58	0.10	0.048	(0.131)	0.024	0.024
260	21.67	0.10	0.048	(0.130)	0.024	0.024
261	21.75	0.10	0.048	(0.130)	0.024	0.024
262	21.83	0.07	0.032	(0.129)	0.016	0.016
263	21.92	0.07	0.032	(0.129)	0.016	0.016
264	22.00	0.07	0.032	(0.128)	0.016	0.016
265	22.08	0.10	0.048	(0.128)	0.024	0.024
266	22.17	0.10	0.048	(0.128)	0.024	0.024
267	22.25	0.10	0.048	(0.127)	0.024	0.024
268	22.33	0.07	0.032	(0.127)	0.016	0.016
269	22.42	0.07	0.032	(0.126)	0.016	0.016
270	22.50	0.07	0.032	(0.126)	0.016	0.016
271	22.58	0.07	0.032	(0.126)	0.016	0.016
272	22.67	0.07	0.032	(0.125)	0.016	0.016
273	22.75	0.07	0.032	(0.125)	0.016	0.016
274	22.83	0.07	0.032	(0.125)	0.016	0.016
275	22.92	0.07	0.032	(0.124)	0.016	0.016
276	23.00	0.07	0.032	(0.124)	0.016	0.016

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277  23.08     0.07      0.032       (  0.124)       0.016        0.016
278  23.17     0.07      0.032       (  0.123)       0.016        0.016
279  23.25     0.07      0.032       (  0.123)       0.016        0.016
280  23.33     0.07      0.032       (  0.123)       0.016        0.016
281  23.42     0.07      0.032       (  0.123)       0.016        0.016
282  23.50     0.07      0.032       (  0.123)       0.016        0.016
283  23.58     0.07      0.032       (  0.122)       0.016        0.016
284  23.67     0.07      0.032       (  0.122)       0.016        0.016
285  23.75     0.07      0.032       (  0.122)       0.016        0.016
286  23.83     0.07      0.032       (  0.122)       0.016        0.016
287  23.92     0.07      0.032       (  0.122)       0.016        0.016
288  24.00     0.07      0.032       (  0.122)       0.016        0.016
              (Loss Rate Not Used)
    Sum =     100.0                                    Sum =    24.6
      Flood volume = Effective rainfall      2.05(In)
       times area      65.6(Ac.)/[(In)/(Ft.)] =      11.2(Ac.Ft)
      Total soil loss =      1.95(In)
      Total soil loss =    10.664(Ac.Ft)
      Total rainfall =      4.00(In)
      Flood volume =      487878.5 Cubic Feet
      Total soil loss =      464511.5 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     20.657(CFS)
      ---------------------------------------------------------------------
      +++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - 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   5   Minute intervals ((CFS))

      ---------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0        7.5      15.0      22.5      30.0
 ------------------------------------------------------------------------
   0+ 5       0.0003      0.05  Q         |         |         |         |
   0+10       0.0019      0.23  Q         |         |         |         |
   0+15       0.0055      0.51  Q         |         |         |         |
   0+20       0.0104      0.72  Q         |         |         |         |
   0+25       0.0167      0.91  VQ        |         |         |         |
   0+30       0.0243      1.11  VQ        |         |         |         |
   0+35       0.0328      1.24  VQ        |         |         |         |
   0+40       0.0419      1.32  VQ        |         |         |         |
   0+45       0.0514      1.37  VQ        |         |         |         |
   0+50       0.0613      1.44  VQ        |         |         |         |
   0+55       0.0721      1.56  V Q       |         |         |         |
   1+ 0       0.0840      1.73  V Q       |         |         |         |
   1+ 5       0.0966      1.82  V Q       |         |         |         |
   1+10       0.1089      1.79  V Q       |         |         |         |
   1+15       0.1206      1.70  V Q       |         |         |         |
   1+20       0.1319      1.64  V Q       |         |         |         |
   1+25       0.1431      1.62  V Q       |         |         |         |
   1+30       0.1542      1.61  V Q       |         |         |         |
   1+35       0.1653      1.61  V Q       |         |         |         |
   1+40       0.1763      1.61  V Q       |         |         |         |
   1+45       0.1874      1.61  V Q       |         |         |         |
   1+50       0.1986      1.63  V Q       |         |         |         |
   1+55       0.2105      1.72  V Q       |         |         |         |
   2+ 0       0.2233      1.86  V Q       |         |         |         |
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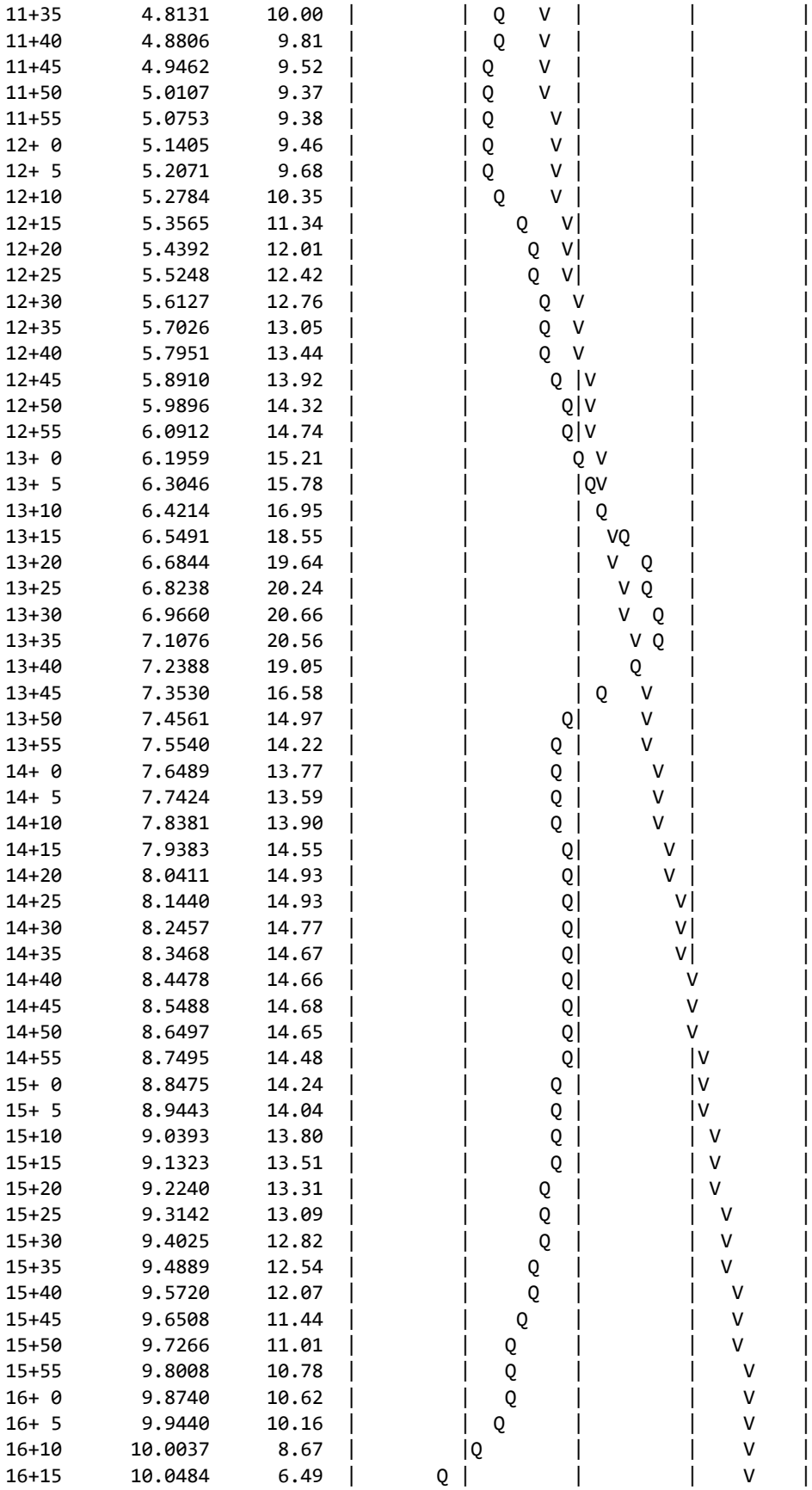
2+ 5	0.2367	1.95	V Q	|	|	|	|
2+10	0.2504	1.99	V Q	|	|	|	|
2+15	0.2643	2.02	V Q	|	|	|	|
2+20	0.2784	2.04	V Q	|	|	|	|
2+25	0.2925	2.06	|VQ	|	|	|	|
2+30	0.3068	2.07	|VQ	|	|	|	|
2+35	0.3212	2.10	|VQ	|	|	|	|
2+40	0.3364	2.20	|VQ	|	|	|	|
2+45	0.3525	2.34	|V Q	|	|	|	|
2+50	0.3693	2.44	|V Q	|	|	|	|
2+55	0.3865	2.49	|V Q	|	|	|	|
3+ 0	0.4039	2.53	|V Q	|	|	|	|
3+ 5	0.4215	2.55	|V Q	|	|	|	|
3+10	0.4392	2.57	|V Q	|	|	|	|
3+15	0.4570	2.59	|V Q	|	|	|	|
3+20	0.4749	2.60	|V Q	|	|	|	|
3+25	0.4929	2.61	|V Q	|	|	|	|
3+30	0.5109	2.62	|V Q	|	|	|	|
3+35	0.5289	2.62	|V Q	|	|	|	|
3+40	0.5470	2.63	|V Q	|	|	|	|
3+45	0.5652	2.63	| VQ	|	|	|	|
3+50	0.5835	2.66	| VQ	|	|	|	|
3+55	0.6024	2.75	| VQ	|	|	|	|
4+ 0	0.6224	2.90	| VQ	|	|	|	|
4+ 5	0.6430	2.99	| VQ	|	|	|	|
4+10	0.6639	3.04	| V Q	|	|	|	|
4+15	0.6851	3.07	| V Q	|	|	|	|
4+20	0.7065	3.11	| V Q	|	|	|	|
4+25	0.7287	3.22	| V Q	|	|	|	|
4+30	0.7520	3.38	| V Q	|	|	|	|
4+35	0.7760	3.48	| V Q	|	|	|	|
4+40	0.8003	3.53	| V Q	|	|	|	|
4+45	0.8249	3.57	| V Q	|	|	|	|
4+50	0.8498	3.62	| VQ	|	|	|	|
4+55	0.8755	3.73	| VQ	|	|	|	|
5+ 0	0.9023	3.89	| V Q	|	|	|	|
5+ 5	0.9296	3.95	| V Q	|	|	|	|
5+10	0.9559	3.82	| V Q	|	|	|	|
5+15	0.9806	3.58	| VQ	|	|	|	|
5+20	1.0043	3.45	| VQ	|	|	|	|
5+25	1.0282	3.47	| VQ	|	|	|	|
5+30	1.0528	3.57	| VQ	|	|	|	|
5+35	1.0780	3.66	| VQ	|	|	|	|
5+40	1.1040	3.78	| V Q	|	|	|	|
5+45	1.1311	3.93	| VQ	|	|	|	|
5+50	1.1589	4.03	| VQ	|	|	|	|
5+55	1.1870	4.08	| VQ	|	|	|	|
6+ 0	1.2153	4.12	| VQ	|	|	|	|
6+ 5	1.2440	4.16	| VQ	|	|	|	|
6+10	1.2735	4.27	| VQ	|	|	|	|
6+15	1.3040	4.43	| VQ	|	|	|	|
6+20	1.3352	4.53	| V Q	|	|	|	|
6+25	1.3668	4.59	| V Q	|	|	|	|
6+30	1.3986	4.63	| V Q	|	|	|	|
6+35	1.4308	4.67	| VQ	|	|	|	|
6+40	1.4638	4.79	| VQ	|	|	|	|
6+45	1.4979	4.95	| VQ	|	|	|	|

6+50	1.5327	5.05	VQ				
6+55	1.5679	5.11	VQ				
7+ 0	1.6034	5.15	VQ				
7+ 5	1.6390	5.18	VQ				
7+10	1.6749	5.20	VQ				
7+15	1.7109	5.22	Q				
7+20	1.7471	5.26	VQ				
7+25	1.7840	5.36	VQ				
7+30	1.8220	5.51	VQ				
7+35	1.8608	5.64	VQ				
7+40	1.9006	5.78	VQ				
7+45	1.9417	5.96	VQ				
7+50	1.9837	6.10	VQ				
7+55	2.0268	6.26	VQ				
8+ 0	2.0711	6.44	VQ				
8+ 5	2.1167	6.61	VQ				
8+10	2.1640	6.87	V Q				
8+15	2.2136	7.20	V Q				
8+20	2.2648	7.43	VQ				
8+25	2.3168	7.55	V Q				
8+30	2.3693	7.63	V Q				
8+35	2.4225	7.71	V Q				
8+40	2.4766	7.86	V Q				
8+45	2.5319	8.04	VQ				
8+50	2.5883	8.18	VQ				
8+55	2.6458	8.35	V Q				
9+ 0	2.7046	8.54	V Q				
9+ 5	2.7646	8.72	V Q				
9+10	2.8265	8.98	VQ				
9+15	2.8907	9.32	V Q				
9+20	2.9565	9.57	V Q				
9+25	3.0239	9.78	V Q				
9+30	3.0928	10.01	V Q				
9+35	3.1630	10.18	V Q				
9+40	3.2344	10.37	V Q				
9+45	3.3073	10.58	V Q				
9+50	3.3813	10.75	V Q				
9+55	3.4566	10.93	V Q				
10+ 0	3.5333	11.13	V Q				
10+ 5	3.6098	11.11	V Q				
10+10	3.6824	10.54	VQ				
10+15	3.7487	9.62	QV				
10+20	3.8108	9.02	QV				
10+25	3.8709	8.73	Q V				
10+30	3.9299	8.56	Q V				
10+35	3.9888	8.55	Q V				
10+40	4.0503	8.92	Q V				
10+45	4.1160	9.55	Q V				
10+50	4.1846	9.96	QV				
10+55	4.2544	10.14	Q V				
11+ 0	4.3250	10.24	Q V				
11+ 5	4.3958	10.29	Q V				
11+10	4.4664	10.25	Q V				
11+15	4.5363	10.15	Q V				
11+20	4.6057	10.08	Q V				
11+25	4.6750	10.06	Q V				
11+30	4.7442	10.05	Q V				



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16+20      10.0831      5.04  |     Q   |         |         |     V   |
16+25      10.1127      4.30  |    Q    |         |         |     V   |
16+30      10.1392      3.84  |    Q    |         |         |     V   |
16+35      10.1630      3.46  |   Q     |         |         |     V   |
16+40      10.1843      3.09  |   Q     |         |         |     V   |
16+45      10.2032      2.74  |  Q      |         |         |     V   |
16+50      10.2202      2.47  |  Q      |         |         |     V   |
16+55      10.2360      2.29  |  Q      |         |         |     V   |
17+ 0      10.2508      2.15  | Q       |         |         |     V   |
17+ 5      10.2651      2.07  | Q       |         |         |     V   |
17+10      10.2800      2.16  | Q       |         |         |     V   |
17+15      10.2963      2.36  |  Q      |         |         |     V   |
17+20      10.3134      2.49  |  Q      |         |         |     V   |
17+25      10.3308      2.53  |  Q      |         |         |     V   |
17+30      10.3484      2.55  |  Q      |         |         |     V   |
17+35      10.3660      2.55  |  Q      |         |         |      V  |
17+40      10.3835      2.55  |  Q      |         |         |      V  |
17+45      10.4011      2.55  |  Q      |         |         |      V  |
17+50      10.4186      2.55  |  Q      |         |         |      V  |
17+55      10.4356      2.47  |  Q      |         |         |      V  |
18+ 0      10.4517      2.34  |  Q      |         |         |      V  |
18+ 5      10.4672      2.25  |  Q      |         |         |      V  |
18+10      10.4824      2.22  | Q       |         |         |      V  |
18+15      10.4976      2.19  | Q       |         |         |      V  |
18+20      10.5126      2.18  | Q       |         |         |      V  |
18+25      10.5275      2.17  | Q       |         |         |      V  |
18+30      10.5424      2.16  | Q       |         |         |      V  |
18+35      10.5570      2.13  | Q       |         |         |      V  |
18+40      10.5710      2.03  | Q       |         |         |      V  |
18+45      10.5841      1.89  | Q       |         |         |      V  |
18+50      10.5962      1.77  | Q       |         |         |      V  |
18+55      10.6074      1.62  | Q       |         |         |      V  |
19+ 0      10.6174      1.45  |Q        |         |         |      V  |
19+ 5      10.6267      1.35  |Q        |         |         |      V  |
19+10      10.6362      1.38  |Q        |         |         |      V  |
19+15      10.6464      1.48  |Q        |         |         |       V |
19+20      10.6572      1.56  | Q       |         |         |       V |
19+25      10.6687      1.67  | Q       |         |         |       V |
19+30      10.6813      1.82  | Q       |         |         |       V |
19+35      10.6943      1.90  | Q       |         |         |       V |
19+40      10.7071      1.85  | Q       |         |         |       V |
19+45      10.7191      1.74  | Q       |         |         |       V |
19+50      10.7305      1.65  | Q       |         |         |       V |
19+55      10.7410      1.53  | Q       |         |         |       V |
20+ 0      10.7504      1.37  |Q        |         |         |       V |
20+ 5      10.7593      1.29  |Q        |         |         |       V |
20+10      10.7685      1.33  |Q        |         |         |       V |
20+15      10.7784      1.44  |Q        |         |         |       V |
20+20      10.7887      1.51  | Q       |         |         |       V |
20+25      10.7993      1.53  | Q       |         |         |       V |
20+30      10.8099      1.55  | Q       |         |         |       V |
20+35      10.8207      1.56  | Q       |         |         |       V |
20+40      10.8314      1.56  | Q       |         |         |       V |
20+45      10.8423      1.57  | Q       |         |         |       V |
20+50      10.8529      1.55  | Q       |         |         |       V |
20+55      10.8630      1.46  |Q        |         |         |       V |
21+ 0      10.8721      1.32  |Q        |         |         |       V |
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  21+ 5      10.8807      1.25  |Q        |         |         |       V |
  21+10      10.8896      1.30  |Q        |         |         |       V |
  21+15      10.8994      1.41  |Q        |         |         |       V |
  21+20      10.9094      1.46  |Q        |         |         |       V |
  21+25      10.9191      1.40  |Q        |         |         |       V |
  21+30      10.9278      1.27  |Q        |         |         |        V|
  21+35      10.9362      1.22  |Q        |         |         |        V|
  21+40      10.9450      1.28  |Q        |         |         |        V|
  21+45      10.9546      1.39  |Q        |         |         |        V|
  21+50      10.9646      1.45  |Q        |         |         |        V|
  21+55      10.9741      1.39  |Q        |         |         |        V|
  22+ 0      10.9829      1.26  |Q        |         |         |        V|
  22+ 5      10.9912      1.21  |Q        |         |         |        V|
  22+10      10.9999      1.27  |Q        |         |         |        V|
  22+15      11.0094      1.39  |Q        |         |         |        V|
  22+20      11.0194      1.44  |Q        |         |         |        V|
  22+25      11.0289      1.38  |Q        |         |         |        V|
  22+30      11.0375      1.26  |Q        |         |         |        V|
  22+35      11.0457      1.18  |Q        |         |         |        V|
  22+40      11.0536      1.15  |Q        |         |         |        V|
  22+45      11.0614      1.13  |Q        |         |         |        V|
  22+50      11.0690      1.11  |Q        |         |         |        V|
  22+55      11.0766      1.10  |Q        |         |         |        V|
  23+ 0      11.0841      1.09  |Q        |         |         |        V|
  23+ 5      11.0916      1.09  |Q        |         |         |        V|
  23+10      11.0991      1.08  |Q        |         |         |        V|
  23+15      11.1065      1.08  |Q        |         |         |        V|
  23+20      11.1139      1.07  |Q        |         |         |        V|
  23+25      11.1213      1.07  |Q        |         |         |        V|
  23+30      11.1286      1.07  |Q        |         |         |        V|
  23+35      11.1360      1.07  |Q        |         |         |        V|
  23+40      11.1433      1.06  |Q        |         |         |        V|
  23+45      11.1506      1.06  |Q        |         |         |        V|
  23+50      11.1579      1.06  |Q        |         |         |        V|
  23+55      11.1652      1.06  |Q        |         |         |        V|
  24+ 0      11.1725      1.06  |Q        |         |         |        V|
  24+ 5      11.1795      1.01  |Q        |         |         |        V|
  24+10      11.1852      0.83  |Q        |         |         |        V|
  24+15      11.1889      0.54  Q        |         |         |        V|
  24+20      11.1914      0.36  Q        |         |         |        V|
  24+25      11.1932      0.27  Q        |         |         |        V|
  24+30      11.1947      0.21  Q        |         |         |        V|
  24+35      11.1958      0.17  Q        |         |         |        V|
  24+40      11.1968      0.13  Q        |         |         |        V|
  24+45      11.1975      0.11  Q        |         |         |        V|
  24+50      11.1981      0.09  Q        |         |         |        V|
  24+55      11.1986      0.07  Q        |         |         |        V|
  25+ 0      11.1990      0.06  Q        |         |         |        V|
  25+ 5      11.1993      0.05  Q        |         |         |        V|
  25+10      11.1996      0.04  Q        |         |         |        V|
  25+15      11.1998      0.03  Q        |         |         |        V|
  25+20      11.1999      0.02  Q        |         |         |        V|
  25+25      11.2000      0.02  Q        |         |         |        V|
  25+30      11.2001      0.01  Q        |         |         |        V|
  25+35      11.2001      0.01  Q        |         |         |        V|
  25+40      11.2001      0.00  Q        |         |         |        V|
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PROPOSED CONDITION UNIT HYDROGRAPHS

PROPOSED CONDITION ONSITE 2-YEAR, 24-HOUR UNIT HYDROGRAPH

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
Study date 12/14/22 File: ONSITEPROP242.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 4010

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

22-0198 - ETHANAC COMMERCE CENTER
ONSITE UNIT HYDROGRAPH ANALYSIS
PROPOSED CONDITION, 2-YEAR 24-HOUR
FN: ONSITEPROP.OUT- RSB

Drainage Area = 19.80(Ac.) = 0.031 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 19.80(Ac.) = 0.031 Sq. Mi.
Length along longest watercourse = 553.00(Ft.)
Length along longest watercourse measured to centroid = 150.00(Ft.)
Length along longest watercourse = 0.105 Mi.
Length along longest watercourse measured to centroid = 0.028 Mi.
Difference in elevation = 7.00(Ft.)
Slope along watercourse = 66.8354 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.018 Hr.
Lag time = 1.07 Min.
25% of lag time = 0.27 Min.
40% of lag time = 0.43 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

```
Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       19.80            1.60                  31.68

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       19.80            4.00                  79.20

STORM EVENT (YEAR) =    2.00
Area Averaged 2-Year Rainfall =    1.600(In)
Area Averaged 100-Year Rainfall =    4.000(In)

Point rain (area averaged) =    1.600(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    1.600(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    19.800           75.00         0.900
 Total Area Entered =     19.80(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-1     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
75.0  57.0      0.501     0.900        0.095       1.000      0.095
                                                 Sum (F) =   0.095
Area averaged mean soil loss (F) (In/Hr) =  0.095
Minimum soil loss rate ((In/Hr)) =  0.048
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.180
------------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                       VALLEY S-Curve
------------------------------------------------------------------------
               Unit Hydrograph Data
------------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                          Graph %            (CFS)
------------------------------------------------------------------------
    1   0.083        469.158         69.318             13.832
    2   0.167        938.316         30.682              6.122
                               Sum = 100.000   Sum=      19.955
------------------------------------------------------------------------

 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value
```

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.013	(0.169)	0.002	0.010
2	0.17	0.07	0.013	(0.168)	0.002	0.010
3	0.25	0.07	0.013	(0.167)	0.002	0.010
4	0.33	0.10	0.019	(0.167)	0.003	0.016
5	0.42	0.10	0.019	(0.166)	0.003	0.016
6	0.50	0.10	0.019	(0.165)	0.003	0.016
7	0.58	0.10	0.019	(0.165)	0.003	0.016
8	0.67	0.10	0.019	(0.164)	0.003	0.016
9	0.75	0.10	0.019	(0.163)	0.003	0.016
10	0.83	0.13	0.026	(0.163)	0.005	0.021
11	0.92	0.13	0.026	(0.162)	0.005	0.021
12	1.00	0.13	0.026	(0.162)	0.005	0.021
13	1.08	0.10	0.019	(0.161)	0.003	0.016
14	1.17	0.10	0.019	(0.160)	0.003	0.016
15	1.25	0.10	0.019	(0.160)	0.003	0.016
16	1.33	0.10	0.019	(0.159)	0.003	0.016
17	1.42	0.10	0.019	(0.158)	0.003	0.016
18	1.50	0.10	0.019	(0.158)	0.003	0.016
19	1.58	0.10	0.019	(0.157)	0.003	0.016
20	1.67	0.10	0.019	(0.156)	0.003	0.016
21	1.75	0.10	0.019	(0.156)	0.003	0.016
22	1.83	0.13	0.026	(0.155)	0.005	0.021
23	1.92	0.13	0.026	(0.155)	0.005	0.021
24	2.00	0.13	0.026	(0.154)	0.005	0.021
25	2.08	0.13	0.026	(0.153)	0.005	0.021
26	2.17	0.13	0.026	(0.153)	0.005	0.021
27	2.25	0.13	0.026	(0.152)	0.005	0.021
28	2.33	0.13	0.026	(0.151)	0.005	0.021
29	2.42	0.13	0.026	(0.151)	0.005	0.021
30	2.50	0.13	0.026	(0.150)	0.005	0.021
31	2.58	0.17	0.032	(0.150)	0.006	0.026
32	2.67	0.17	0.032	(0.149)	0.006	0.026
33	2.75	0.17	0.032	(0.148)	0.006	0.026
34	2.83	0.17	0.032	(0.148)	0.006	0.026
35	2.92	0.17	0.032	(0.147)	0.006	0.026
36	3.00	0.17	0.032	(0.147)	0.006	0.026
37	3.08	0.17	0.032	(0.146)	0.006	0.026
38	3.17	0.17	0.032	(0.145)	0.006	0.026
39	3.25	0.17	0.032	(0.145)	0.006	0.026
40	3.33	0.17	0.032	(0.144)	0.006	0.026
41	3.42	0.17	0.032	(0.144)	0.006	0.026
42	3.50	0.17	0.032	(0.143)	0.006	0.026
43	3.58	0.17	0.032	(0.142)	0.006	0.026
44	3.67	0.17	0.032	(0.142)	0.006	0.026
45	3.75	0.17	0.032	(0.141)	0.006	0.026
46	3.83	0.20	0.038	(0.141)	0.007	0.031
47	3.92	0.20	0.038	(0.140)	0.007	0.031

48	4.00	0.20	0.038	(0.139)	0.007	0.031
49	4.08	0.20	0.038	(0.139)	0.007	0.031
50	4.17	0.20	0.038	(0.138)	0.007	0.031
51	4.25	0.20	0.038	(0.138)	0.007	0.031
52	4.33	0.23	0.045	(0.137)	0.008	0.037
53	4.42	0.23	0.045	(0.136)	0.008	0.037
54	4.50	0.23	0.045	(0.136)	0.008	0.037
55	4.58	0.23	0.045	(0.135)	0.008	0.037
56	4.67	0.23	0.045	(0.135)	0.008	0.037
57	4.75	0.23	0.045	(0.134)	0.008	0.037
58	4.83	0.27	0.051	(0.134)	0.009	0.042
59	4.92	0.27	0.051	(0.133)	0.009	0.042
60	5.00	0.27	0.051	(0.132)	0.009	0.042
61	5.08	0.20	0.038	(0.132)	0.007	0.031
62	5.17	0.20	0.038	(0.131)	0.007	0.031
63	5.25	0.20	0.038	(0.131)	0.007	0.031
64	5.33	0.23	0.045	(0.130)	0.008	0.037
65	5.42	0.23	0.045	(0.129)	0.008	0.037
66	5.50	0.23	0.045	(0.129)	0.008	0.037
67	5.58	0.27	0.051	(0.128)	0.009	0.042
68	5.67	0.27	0.051	(0.128)	0.009	0.042
69	5.75	0.27	0.051	(0.127)	0.009	0.042
70	5.83	0.27	0.051	(0.127)	0.009	0.042
71	5.92	0.27	0.051	(0.126)	0.009	0.042
72	6.00	0.27	0.051	(0.126)	0.009	0.042
73	6.08	0.30	0.058	(0.125)	0.010	0.047
74	6.17	0.30	0.058	(0.124)	0.010	0.047
75	6.25	0.30	0.058	(0.124)	0.010	0.047
76	6.33	0.30	0.058	(0.123)	0.010	0.047
77	6.42	0.30	0.058	(0.123)	0.010	0.047
78	6.50	0.30	0.058	(0.122)	0.010	0.047
79	6.58	0.33	0.064	(0.122)	0.012	0.052
80	6.67	0.33	0.064	(0.121)	0.012	0.052
81	6.75	0.33	0.064	(0.121)	0.012	0.052
82	6.83	0.33	0.064	(0.120)	0.012	0.052
83	6.92	0.33	0.064	(0.119)	0.012	0.052
84	7.00	0.33	0.064	(0.119)	0.012	0.052
85	7.08	0.33	0.064	(0.118)	0.012	0.052
86	7.17	0.33	0.064	(0.118)	0.012	0.052
87	7.25	0.33	0.064	(0.117)	0.012	0.052
88	7.33	0.37	0.070	(0.117)	0.013	0.058
89	7.42	0.37	0.070	(0.116)	0.013	0.058
90	7.50	0.37	0.070	(0.116)	0.013	0.058
91	7.58	0.40	0.077	(0.115)	0.014	0.063
92	7.67	0.40	0.077	(0.115)	0.014	0.063
93	7.75	0.40	0.077	(0.114)	0.014	0.063
94	7.83	0.43	0.083	(0.114)	0.015	0.068
95	7.92	0.43	0.083	(0.113)	0.015	0.068
96	8.00	0.43	0.083	(0.113)	0.015	0.068
97	8.08	0.50	0.096	(0.112)	0.017	0.079

98	8.17	0.50	0.096	(0.112)	0.017	0.079
99	8.25	0.50	0.096	(0.111)	0.017	0.079
100	8.33	0.50	0.096	(0.110)	0.017	0.079
101	8.42	0.50	0.096	(0.110)	0.017	0.079
102	8.50	0.50	0.096	(0.109)	0.017	0.079
103	8.58	0.53	0.102	(0.109)	0.018	0.084
104	8.67	0.53	0.102	(0.108)	0.018	0.084
105	8.75	0.53	0.102	(0.108)	0.018	0.084
106	8.83	0.57	0.109	(0.107)	0.020	0.089
107	8.92	0.57	0.109	(0.107)	0.020	0.089
108	9.00	0.57	0.109	(0.106)	0.020	0.089
109	9.08	0.63	0.122	(0.106)	0.022	0.100
110	9.17	0.63	0.122	(0.105)	0.022	0.100
111	9.25	0.63	0.122	(0.105)	0.022	0.100
112	9.33	0.67	0.128	(0.104)	0.023	0.105
113	9.42	0.67	0.128	(0.104)	0.023	0.105
114	9.50	0.67	0.128	(0.103)	0.023	0.105
115	9.58	0.70	0.134	(0.103)	0.024	0.110
116	9.67	0.70	0.134	(0.102)	0.024	0.110
117	9.75	0.70	0.134	(0.102)	0.024	0.110
118	9.83	0.73	0.141	(0.101)	0.025	0.115
119	9.92	0.73	0.141	(0.101)	0.025	0.115
120	10.00	0.73	0.141	(0.100)	0.025	0.115
121	10.08	0.50	0.096	(0.100)	0.017	0.079
122	10.17	0.50	0.096	(0.099)	0.017	0.079
123	10.25	0.50	0.096	(0.099)	0.017	0.079
124	10.33	0.50	0.096	(0.099)	0.017	0.079
125	10.42	0.50	0.096	(0.098)	0.017	0.079
126	10.50	0.50	0.096	(0.098)	0.017	0.079
127	10.58	0.67	0.128	(0.097)	0.023	0.105
128	10.67	0.67	0.128	(0.097)	0.023	0.105
129	10.75	0.67	0.128	(0.096)	0.023	0.105
130	10.83	0.67	0.128	(0.096)	0.023	0.105
131	10.92	0.67	0.128	(0.095)	0.023	0.105
132	11.00	0.67	0.128	(0.095)	0.023	0.105
133	11.08	0.63	0.122	(0.094)	0.022	0.100
134	11.17	0.63	0.122	(0.094)	0.022	0.100
135	11.25	0.63	0.122	(0.093)	0.022	0.100
136	11.33	0.63	0.122	(0.093)	0.022	0.100
137	11.42	0.63	0.122	(0.092)	0.022	0.100
138	11.50	0.63	0.122	(0.092)	0.022	0.100
139	11.58	0.57	0.109	(0.091)	0.020	0.089
140	11.67	0.57	0.109	(0.091)	0.020	0.089
141	11.75	0.57	0.109	(0.091)	0.020	0.089
142	11.83	0.60	0.115	(0.090)	0.021	0.094
143	11.92	0.60	0.115	(0.090)	0.021	0.094
144	12.00	0.60	0.115	(0.089)	0.021	0.094
145	12.08	0.83	0.160	(0.089)	0.029	0.131
146	12.17	0.83	0.160	(0.088)	0.029	0.131
147	12.25	0.83	0.160	(0.088)	0.029	0.131

148	12.33	0.87	0.166	(0.087)	0.030	0.136
149	12.42	0.87	0.166	(0.087)	0.030	0.136
150	12.50	0.87	0.166	(0.087)	0.030	0.136
151	12.58	0.93	0.179	(0.086)	0.032	0.147
152	12.67	0.93	0.179	(0.086)	0.032	0.147
153	12.75	0.93	0.179	(0.085)	0.032	0.147
154	12.83	0.97	0.186	(0.085)	0.033	0.152
155	12.92	0.97	0.186	(0.084)	0.033	0.152
156	13.00	0.97	0.186	(0.084)	0.033	0.152
157	13.08	1.13	0.218	(0.084)	0.039	0.178
158	13.17	1.13	0.218	(0.083)	0.039	0.178
159	13.25	1.13	0.218	(0.083)	0.039	0.178
160	13.33	1.13	0.218	(0.082)	0.039	0.178
161	13.42	1.13	0.218	(0.082)	0.039	0.178
162	13.50	1.13	0.218	(0.081)	0.039	0.178
163	13.58	0.77	0.147	(0.081)	0.026	0.121
164	13.67	0.77	0.147	(0.081)	0.026	0.121
165	13.75	0.77	0.147	(0.080)	0.026	0.121
166	13.83	0.77	0.147	(0.080)	0.026	0.121
167	13.92	0.77	0.147	(0.079)	0.026	0.121
168	14.00	0.77	0.147	(0.079)	0.026	0.121
169	14.08	0.90	0.173	(0.079)	0.031	0.142
170	14.17	0.90	0.173	(0.078)	0.031	0.142
171	14.25	0.90	0.173	(0.078)	0.031	0.142
172	14.33	0.87	0.166	(0.077)	0.030	0.136
173	14.42	0.87	0.166	(0.077)	0.030	0.136
174	14.50	0.87	0.166	(0.077)	0.030	0.136
175	14.58	0.87	0.166	(0.076)	0.030	0.136
176	14.67	0.87	0.166	(0.076)	0.030	0.136
177	14.75	0.87	0.166	(0.075)	0.030	0.136
178	14.83	0.83	0.160	(0.075)	0.029	0.131
179	14.92	0.83	0.160	(0.075)	0.029	0.131
180	15.00	0.83	0.160	(0.074)	0.029	0.131
181	15.08	0.80	0.154	(0.074)	0.028	0.126
182	15.17	0.80	0.154	(0.074)	0.028	0.126
183	15.25	0.80	0.154	(0.073)	0.028	0.126
184	15.33	0.77	0.147	(0.073)	0.026	0.121
185	15.42	0.77	0.147	(0.072)	0.026	0.121
186	15.50	0.77	0.147	(0.072)	0.026	0.121
187	15.58	0.63	0.122	(0.072)	0.022	0.100
188	15.67	0.63	0.122	(0.071)	0.022	0.100
189	15.75	0.63	0.122	(0.071)	0.022	0.100
190	15.83	0.63	0.122	(0.071)	0.022	0.100
191	15.92	0.63	0.122	(0.070)	0.022	0.100
192	16.00	0.63	0.122	(0.070)	0.022	0.100
193	16.08	0.13	0.026	(0.069)	0.005	0.021
194	16.17	0.13	0.026	(0.069)	0.005	0.021
195	16.25	0.13	0.026	(0.069)	0.005	0.021
196	16.33	0.13	0.026	(0.068)	0.005	0.021
197	16.42	0.13	0.026	(0.068)	0.005	0.021

198	16.50	0.13	0.026	(0.068)	0.005	0.021
199	16.58	0.10	0.019	(0.067)	0.003	0.016
200	16.67	0.10	0.019	(0.067)	0.003	0.016
201	16.75	0.10	0.019	(0.067)	0.003	0.016
202	16.83	0.10	0.019	(0.066)	0.003	0.016
203	16.92	0.10	0.019	(0.066)	0.003	0.016
204	17.00	0.10	0.019	(0.066)	0.003	0.016
205	17.08	0.17	0.032	(0.065)	0.006	0.026
206	17.17	0.17	0.032	(0.065)	0.006	0.026
207	17.25	0.17	0.032	(0.065)	0.006	0.026
208	17.33	0.17	0.032	(0.064)	0.006	0.026
209	17.42	0.17	0.032	(0.064)	0.006	0.026
210	17.50	0.17	0.032	(0.064)	0.006	0.026
211	17.58	0.17	0.032	(0.063)	0.006	0.026
212	17.67	0.17	0.032	(0.063)	0.006	0.026
213	17.75	0.17	0.032	(0.063)	0.006	0.026
214	17.83	0.13	0.026	(0.062)	0.005	0.021
215	17.92	0.13	0.026	(0.062)	0.005	0.021
216	18.00	0.13	0.026	(0.062)	0.005	0.021
217	18.08	0.13	0.026	(0.062)	0.005	0.021
218	18.17	0.13	0.026	(0.061)	0.005	0.021
219	18.25	0.13	0.026	(0.061)	0.005	0.021
220	18.33	0.13	0.026	(0.061)	0.005	0.021
221	18.42	0.13	0.026	(0.060)	0.005	0.021
222	18.50	0.13	0.026	(0.060)	0.005	0.021
223	18.58	0.10	0.019	(0.060)	0.003	0.016
224	18.67	0.10	0.019	(0.059)	0.003	0.016
225	18.75	0.10	0.019	(0.059)	0.003	0.016
226	18.83	0.07	0.013	(0.059)	0.002	0.010
227	18.92	0.07	0.013	(0.059)	0.002	0.010
228	19.00	0.07	0.013	(0.058)	0.002	0.010
229	19.08	0.10	0.019	(0.058)	0.003	0.016
230	19.17	0.10	0.019	(0.058)	0.003	0.016
231	19.25	0.10	0.019	(0.058)	0.003	0.016
232	19.33	0.13	0.026	(0.057)	0.005	0.021
233	19.42	0.13	0.026	(0.057)	0.005	0.021
234	19.50	0.13	0.026	(0.057)	0.005	0.021
235	19.58	0.10	0.019	(0.056)	0.003	0.016
236	19.67	0.10	0.019	(0.056)	0.003	0.016
237	19.75	0.10	0.019	(0.056)	0.003	0.016
238	19.83	0.07	0.013	(0.056)	0.002	0.010
239	19.92	0.07	0.013	(0.055)	0.002	0.010
240	20.00	0.07	0.013	(0.055)	0.002	0.010
241	20.08	0.10	0.019	(0.055)	0.003	0.016
242	20.17	0.10	0.019	(0.055)	0.003	0.016
243	20.25	0.10	0.019	(0.055)	0.003	0.016
244	20.33	0.10	0.019	(0.054)	0.003	0.016
245	20.42	0.10	0.019	(0.054)	0.003	0.016
246	20.50	0.10	0.019	(0.054)	0.003	0.016
247	20.58	0.10	0.019	(0.054)	0.003	0.016

248	20.67	0.10	0.019	(0.053)	0.003	0.016
249	20.75	0.10	0.019	(0.053)	0.003	0.016
250	20.83	0.07	0.013	(0.053)	0.002	0.010
251	20.92	0.07	0.013	(0.053)	0.002	0.010
252	21.00	0.07	0.013	(0.052)	0.002	0.010
253	21.08	0.10	0.019	(0.052)	0.003	0.016
254	21.17	0.10	0.019	(0.052)	0.003	0.016
255	21.25	0.10	0.019	(0.052)	0.003	0.016
256	21.33	0.07	0.013	(0.052)	0.002	0.010
257	21.42	0.07	0.013	(0.051)	0.002	0.010
258	21.50	0.07	0.013	(0.051)	0.002	0.010
259	21.58	0.10	0.019	(0.051)	0.003	0.016
260	21.67	0.10	0.019	(0.051)	0.003	0.016
261	21.75	0.10	0.019	(0.051)	0.003	0.016
262	21.83	0.07	0.013	(0.051)	0.002	0.010
263	21.92	0.07	0.013	(0.050)	0.002	0.010
264	22.00	0.07	0.013	(0.050)	0.002	0.010
265	22.08	0.10	0.019	(0.050)	0.003	0.016
266	22.17	0.10	0.019	(0.050)	0.003	0.016
267	22.25	0.10	0.019	(0.050)	0.003	0.016
268	22.33	0.07	0.013	(0.050)	0.002	0.010
269	22.42	0.07	0.013	(0.049)	0.002	0.010
270	22.50	0.07	0.013	(0.049)	0.002	0.010
271	22.58	0.07	0.013	(0.049)	0.002	0.010
272	22.67	0.07	0.013	(0.049)	0.002	0.010
273	22.75	0.07	0.013	(0.049)	0.002	0.010
274	22.83	0.07	0.013	(0.049)	0.002	0.010
275	22.92	0.07	0.013	(0.049)	0.002	0.010
276	23.00	0.07	0.013	(0.048)	0.002	0.010
277	23.08	0.07	0.013	(0.048)	0.002	0.010
278	23.17	0.07	0.013	(0.048)	0.002	0.010
279	23.25	0.07	0.013	(0.048)	0.002	0.010
280	23.33	0.07	0.013	(0.048)	0.002	0.010
281	23.42	0.07	0.013	(0.048)	0.002	0.010
282	23.50	0.07	0.013	(0.048)	0.002	0.010
283	23.58	0.07	0.013	(0.048)	0.002	0.010
284	23.67	0.07	0.013	(0.048)	0.002	0.010
285	23.75	0.07	0.013	(0.048)	0.002	0.010
286	23.83	0.07	0.013	(0.048)	0.002	0.010
287	23.92	0.07	0.013	(0.048)	0.002	0.010
288	24.00	0.07	0.013	(0.048)	0.002	0.010

(Loss Rate Not Used)

Sum = 100.0 Sum = 15.7

Flood volume = Effective rainfall 1.31(In)
times area 19.8(Ac.)/[(In)/(Ft.)] = 2.2(Ac.Ft)
Total soil loss = 0.29(In)
Total soil loss = 0.475(Ac.Ft)
Total rainfall = 1.60(In)
Flood volume = 94295.0 Cubic Feet
Total soil loss = 20698.9 Cubic Feet

Peak flow rate of this hydrograph = 3.562(CFS)

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24 - H O U R S T O R M

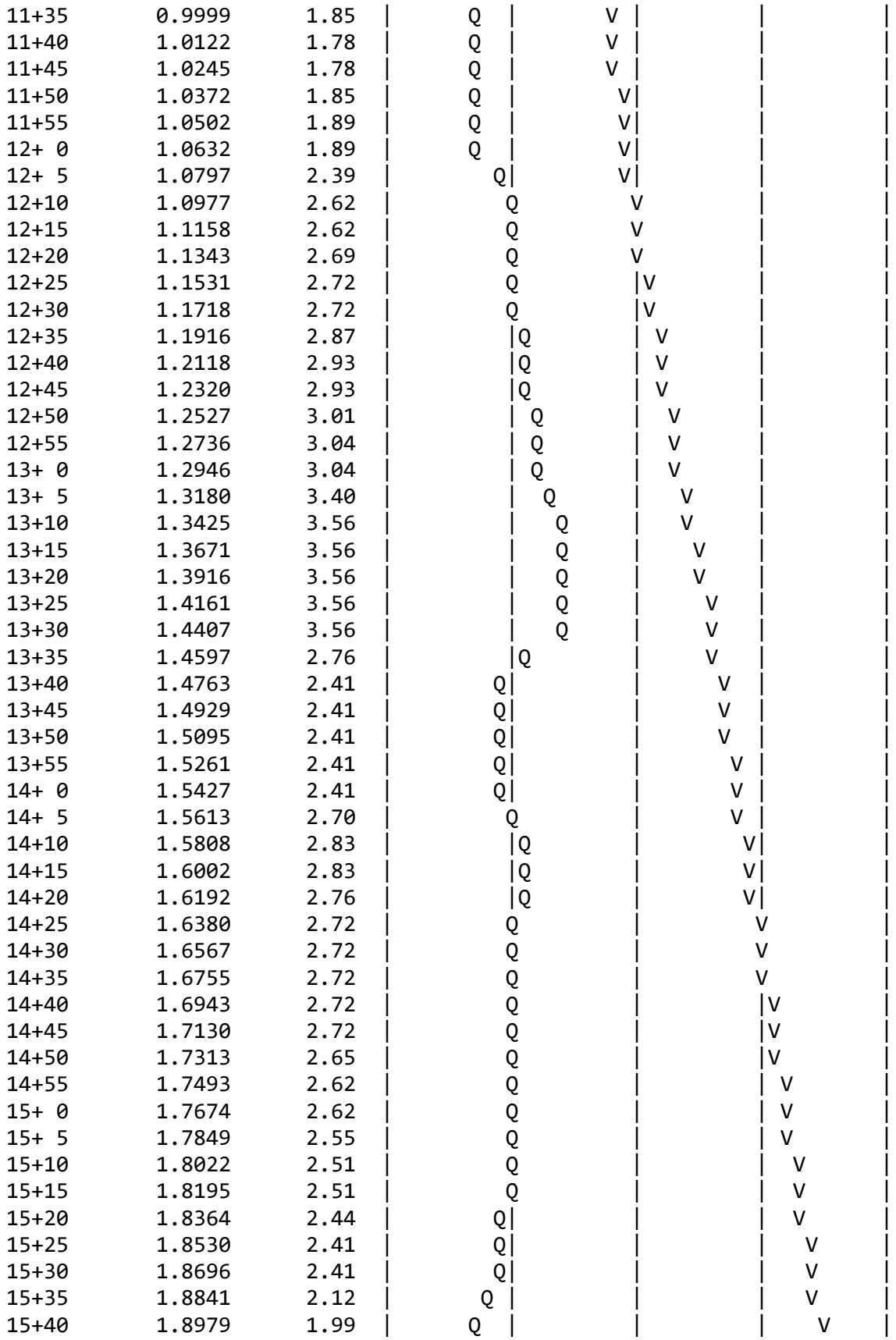
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0010	0.15	Q				
0+10	0.0024	0.21	Q				
0+15	0.0039	0.21	Q				
0+20	0.0058	0.28	VQ				
0+25	0.0080	0.31	VQ				
0+30	0.0102	0.31	VQ				
0+35	0.0123	0.31	VQ				
0+40	0.0145	0.31	VQ				
0+45	0.0167	0.31	VQ				
0+50	0.0193	0.39	VQ				
0+55	0.0222	0.42	VQ				
1+ 0	0.0251	0.42	VQ				
1+ 5	0.0275	0.35	VQ				
1+10	0.0296	0.31	VQ				
1+15	0.0318	0.31	VQ				
1+20	0.0340	0.31	VQ				
1+25	0.0361	0.31	VQ				
1+30	0.0383	0.31	VQ				
1+35	0.0405	0.31	VQ				
1+40	0.0426	0.31	VQ				
1+45	0.0448	0.31	VQ				
1+50	0.0475	0.39	VQ				
1+55	0.0503	0.42	VQ				
2+ 0	0.0532	0.42	VQ				
2+ 5	0.0561	0.42	|Q				
2+10	0.0590	0.42	|Q				
2+15	0.0619	0.42	|Q				
2+20	0.0648	0.42	|Q				
2+25	0.0677	0.42	|Q				
2+30	0.0706	0.42	|Q				
2+35	0.0739	0.49	|Q				
2+40	0.0775	0.52	|VQ				
2+45	0.0812	0.52	|VQ				
2+50	0.0848	0.52	|VQ				
2+55	0.0884	0.52	|VQ				
3+ 0	0.0920	0.52	|VQ				
3+ 5	0.0956	0.52	|VQ				
3+10	0.0992	0.52	|VQ				

3+15	0.1028	0.52	VQ				
3+20	0.1064	0.52	VQ				
3+25	0.1100	0.52	Q				
3+30	0.1136	0.52	Q				
3+35	0.1172	0.52	Q				
3+40	0.1208	0.52	Q				
3+45	0.1244	0.52	Q				
3+50	0.1286	0.60	Q				
3+55	0.1329	0.63	Q				
4+ 0	0.1372	0.63	Q				
4+ 5	0.1415	0.63	Q				
4+10	0.1459	0.63	Q				
4+15	0.1502	0.63	Q				
4+20	0.1550	0.70	Q				
4+25	0.1601	0.73	Q				
4+30	0.1651	0.73	QV				
4+35	0.1702	0.73	QV				
4+40	0.1752	0.73	QV				
4+45	0.1803	0.73	QV				
4+50	0.1858	0.81	Q				
4+55	0.1916	0.84	Q				
5+ 0	0.1974	0.84	Q				
5+ 5	0.2022	0.69	QV				
5+10	0.2065	0.63	QV				
5+15	0.2108	0.63	QV				
5+20	0.2156	0.70	QV				
5+25	0.2207	0.73	Q V				
5+30	0.2257	0.73	Q V				
5+35	0.2313	0.81	QV				
5+40	0.2371	0.84	QV				
5+45	0.2428	0.84	QV				
5+50	0.2486	0.84	QV				
5+55	0.2544	0.84	QV				
6+ 0	0.2602	0.84	QV				
6+ 5	0.2664	0.91	QV				
6+10	0.2729	0.94	Q V				
6+15	0.2794	0.94	Q V				
6+20	0.2859	0.94	Q V				
6+25	0.2924	0.94	Q V				
6+30	0.2989	0.94	Q V				
6+35	0.3059	1.02	QV				
6+40	0.3131	1.05	QV				
6+45	0.3203	1.05	QV				
6+50	0.3275	1.05	Q V				
6+55	0.3348	1.05	Q V				
7+ 0	0.3420	1.05	Q V				
7+ 5	0.3492	1.05	Q V				
7+10	0.3564	1.05	Q V				
7+15	0.3636	1.05	Q V				
7+20	0.3713	1.12	Q V				

7+25	0.3793	1.15	Q V				
7+30	0.3872	1.15	Q V				
7+35	0.3957	1.23	Q V				
7+40	0.4043	1.26	Q V				
7+45	0.4130	1.26	Q V				
7+50	0.4221	1.33	Q V				
7+55	0.4315	1.36	Q V				
8+ 0	0.4409	1.36	Q V				
8+ 5	0.4513	1.51	Q V				
8+10	0.4621	1.57	Q V				
8+15	0.4729	1.57	Q V				
8+20	0.4837	1.57	Q V				
8+25	0.4946	1.57	Q V				
8+30	0.5054	1.57	Q V				
8+35	0.5167	1.64	Q V				
8+40	0.5283	1.68	Q V				
8+45	0.5398	1.68	Q V				
8+50	0.5518	1.75	Q V				
8+55	0.5641	1.78	Q V				
9+ 0	0.5764	1.78	Q V				
9+ 5	0.5896	1.93	Q V				
9+10	0.6034	1.99	Q V				
9+15	0.6171	1.99	Q V				
9+20	0.6313	2.06	Q V				
9+25	0.6457	2.10	Q V				
9+30	0.6601	2.10	Q V				
9+35	0.6751	2.17	Q V				
9+40	0.6902	2.20	Q V				
9+45	0.7054	2.20	Q V				
9+50	0.7210	2.27	Q V				
9+55	0.7369	2.30	Q V				
10+ 0	0.7528	2.30	Q V				
10+ 5	0.7652	1.80	Q V				
10+10	0.7760	1.57	Q V				
10+15	0.7868	1.57	Q V				
10+20	0.7976	1.57	Q V				
10+25	0.8084	1.57	Q V				
10+30	0.8193	1.57	Q V				
10+35	0.8326	1.93	Q V				
10+40	0.8470	2.10	Q V				
10+45	0.8615	2.10	Q V				
10+50	0.8759	2.10	Q V				
10+55	0.8903	2.10	Q V				
11+ 0	0.9048	2.10	Q V				
11+ 5	0.9187	2.02	Q V				
11+10	0.9324	1.99	Q V				
11+15	0.9461	1.99	Q V				
11+20	0.9598	1.99	Q V				
11+25	0.9735	1.99	Q V				
11+30	0.9872	1.99	Q V				



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15+45       1.9116      1.99  |       Q  |          |          |     V    |
15+50       1.9253      1.99  |       Q  |          |          |     V    |
15+55       1.9390      1.99  |       Q  |          |          |     V    |
16+ 0       1.9527      1.99  |       Q  |          |          |      V   |
16+ 5       1.9589      0.90  |   Q      |          |          |      V   |
16+10       1.9618      0.42  |Q         |          |          |      V   |
16+15       1.9647      0.42  |Q         |          |          |      V   |
16+20       1.9676      0.42  |Q         |          |          |      V   |
16+25       1.9704      0.42  |Q         |          |          |      V   |
16+30       1.9733      0.42  |Q         |          |          |      V   |
16+35       1.9757      0.35  |Q         |          |          |      V   |
16+40       1.9779      0.31  |Q         |          |          |      V   |
16+45       1.9801      0.31  |Q         |          |          |      V   |
16+50       1.9822      0.31  |Q         |          |          |      V   |
16+55       1.9844      0.31  |Q         |          |          |      V   |
17+ 0       1.9865      0.31  |Q         |          |          |      V   |
17+ 5       1.9897      0.46  |Q         |          |          |      V   |
17+10       1.9933      0.52  | Q        |          |          |      V   |
17+15       1.9969      0.52  | Q        |          |          |      V   |
17+20       2.0005      0.52  | Q        |          |          |      V   |
17+25       2.0041      0.52  | Q        |          |          |       V  |
17+30       2.0077      0.52  | Q        |          |          |       V  |
17+35       2.0114      0.52  | Q        |          |          |       V  |
17+40       2.0150      0.52  | Q        |          |          |       V  |
17+45       2.0186      0.52  | Q        |          |          |       V  |
17+50       2.0217      0.45  |Q         |          |          |       V  |
17+55       2.0246      0.42  |Q         |          |          |       V  |
18+ 0       2.0275      0.42  |Q         |          |          |       V  |
18+ 5       2.0303      0.42  |Q         |          |          |       V  |
18+10       2.0332      0.42  |Q         |          |          |       V  |
18+15       2.0361      0.42  |Q         |          |          |       V  |
18+20       2.0390      0.42  |Q         |          |          |       V  |
18+25       2.0419      0.42  |Q         |          |          |       V  |
18+30       2.0448      0.42  |Q         |          |          |       V  |
18+35       2.0472      0.35  |Q         |          |          |       V  |
18+40       2.0493      0.31  |Q         |          |          |       V  |
18+45       2.0515      0.31  |Q         |          |          |       V  |
18+50       2.0532      0.24  Q          |          |          |       V  |
18+55       2.0546      0.21  Q          |          |          |       V  |
19+ 0       2.0560      0.21  Q          |          |          |       V  |
19+ 5       2.0580      0.28  |Q         |          |          |        V |
19+10       2.0601      0.31  |Q         |          |          |        V |
19+15       2.0623      0.31  |Q         |          |          |        V |
19+20       2.0650      0.39  |Q         |          |          |        V |
19+25       2.0679      0.42  |Q         |          |          |        V |
19+30       2.0707      0.42  |Q         |          |          |        V |
19+35       2.0731      0.35  |Q         |          |          |        V |
19+40       2.0753      0.31  |Q         |          |          |        V |
19+45       2.0775      0.31  |Q         |          |          |        V |
19+50       2.0791      0.24  Q          |          |          |        V |
```

Qpeak,pre = 0.43 cfs
2.0246-0.0706=1.954 ac-ft
85,116 cf
110% preliminary
93,628 cf

```
19+55       2.0806      0.21  Q         |         |         |        V |
20+ 0       2.0820      0.21  Q         |         |         |        V |
20+ 5       2.0840      0.28  |Q        |         |         |        V |
20+10       2.0861      0.31  |Q        |         |         |        V |
20+15       2.0883      0.31  |Q        |         |         |        V |
20+20       2.0905      0.31  |Q        |         |         |        V |
20+25       2.0926      0.31  |Q        |         |         |        V |
20+30       2.0948      0.31  |Q        |         |         |        V |
20+35       2.0969      0.31  |Q        |         |         |        V |
20+40       2.0991      0.31  |Q        |         |         |        V |
20+45       2.1013      0.31  |Q        |         |         |        V |
20+50       2.1029      0.24  Q         |         |         |        V |
20+55       2.1044      0.21  Q         |         |         |        V |
21+ 0       2.1058      0.21  Q         |         |         |        V |
21+ 5       2.1078      0.28  |Q        |         |         |        V |
21+10       2.1099      0.31  |Q        |         |         |        V |
21+15       2.1121      0.31  |Q        |         |         |         V|
21+20       2.1138      0.24  Q         |         |         |         V|
21+25       2.1152      0.21  Q         |         |         |         V|
21+30       2.1166      0.21  Q         |         |         |         V|
21+35       2.1186      0.28  |Q        |         |         |         V|
21+40       2.1208      0.31  |Q        |         |         |         V|
21+45       2.1229      0.31  |Q        |         |         |         V|
21+50       2.1246      0.24  Q         |         |         |         V|
21+55       2.1260      0.21  Q         |         |         |         V|
22+ 0       2.1275      0.21  Q         |         |         |         V|
22+ 5       2.1294      0.28  |Q        |         |         |         V|
22+10       2.1316      0.31  |Q        |         |         |         V|
22+15       2.1337      0.31  |Q        |         |         |         V|
22+20       2.1354      0.24  Q         |         |         |         V|
22+25       2.1369      0.21  Q         |         |         |         V|
22+30       2.1383      0.21  Q         |         |         |         V|
22+35       2.1397      0.21  Q         |         |         |         V|
22+40       2.1412      0.21  Q         |         |         |         V|
22+45       2.1426      0.21  Q         |         |         |         V|
22+50       2.1441      0.21  Q         |         |         |         V|
22+55       2.1455      0.21  Q         |         |         |         V|
23+ 0       2.1470      0.21  Q         |         |         |         V|
23+ 5       2.1484      0.21  Q         |         |         |         V|
23+10       2.1498      0.21  Q         |         |         |         V|
23+15       2.1513      0.21  Q         |         |         |         V|
23+20       2.1527      0.21  Q         |         |         |         V|
23+25       2.1542      0.21  Q         |         |         |         V|
23+30       2.1556      0.21  Q         |         |         |         V|
23+35       2.1571      0.21  Q         |         |         |         V|
23+40       2.1585      0.21  Q         |         |         |         V|
23+45       2.1599      0.21  Q         |         |         |         V|
23+50       2.1614      0.21  Q         |         |         |         V|
23+55       2.1628      0.21  Q         |         |         |         V|
24+ 0       2.1643      0.21  Q         |         |         |         V|
```

```
   24+ 5       2.1647      0.06  Q         |         |         |        V|
-------------------------------------------------------------------------
```

PROPOSED CONDITION ONSITE 100-YEAR, 24-HOUR UNIT HYDROGRAPH

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
Study date 04/04/23 File: ONSITEPROP24100.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 4010

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

22-0198 - ETHANAC COMMERCE CENTER
ONSITE UNIT HYDROGRAPH ANALYSIS
PROPOSED CONDITION, 100-YEAR 24-HOUR
FN: ONSITEPROP.OUT- RSB

Drainage Area = 19.80(Ac.) = 0.031 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 19.80(Ac.) = 0.031 Sq. Mi.
Length along longest watercourse = 553.00(Ft.)
Length along longest watercourse measured to centroid = 150.00(Ft.)
Length along longest watercourse = 0.105 Mi.
Length along longest watercourse measured to centroid = 0.028 Mi.
Difference in elevation = 7.00(Ft.)
Slope along watercourse = 66.8354 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.018 Hr.
Lag time = 1.07 Min.
25% of lag time = 0.27 Min.
40% of lag time = 0.43 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

```
Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       19.80            1.60                  31.68

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       19.80            4.00                  79.20

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.600(In)
Area Averaged 100-Year Rainfall =    4.000(In)

Point rain (area averaged) =    4.000(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    4.000(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    19.800           75.00         0.900
 Total Area Entered =     19.80(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
75.0  75.0      0.303     0.900        0.058       1.000      0.058
                                                 Sum (F) =   0.058
Area averaged mean soil loss (F) (In/Hr) =  0.058
Minimum soil loss rate ((In/Hr)) =  0.029
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.180
------------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                       VALLEY S-Curve
------------------------------------------------------------------------
               Unit Hydrograph Data
------------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                          Graph %            (CFS)
------------------------------------------------------------------------
    1   0.083        469.158         69.318             13.832
    2   0.167        938.316         30.682              6.122
                              Sum = 100.000   Sum=      19.955
------------------------------------------------------------------------

 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value
```

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.032	(0.102)	0.006	0.026
2	0.17	0.07	0.032	(0.102)	0.006	0.026
3	0.25	0.07	0.032	(0.101)	0.006	0.026
4	0.33	0.10	0.048	(0.101)	0.009	0.039
5	0.42	0.10	0.048	(0.100)	0.009	0.039
6	0.50	0.10	0.048	(0.100)	0.009	0.039
7	0.58	0.10	0.048	(0.100)	0.009	0.039
8	0.67	0.10	0.048	(0.099)	0.009	0.039
9	0.75	0.10	0.048	(0.099)	0.009	0.039
10	0.83	0.13	0.064	(0.099)	0.012	0.052
11	0.92	0.13	0.064	(0.098)	0.012	0.052
12	1.00	0.13	0.064	(0.098)	0.012	0.052
13	1.08	0.10	0.048	(0.097)	0.009	0.039
14	1.17	0.10	0.048	(0.097)	0.009	0.039
15	1.25	0.10	0.048	(0.097)	0.009	0.039
16	1.33	0.10	0.048	(0.096)	0.009	0.039
17	1.42	0.10	0.048	(0.096)	0.009	0.039
18	1.50	0.10	0.048	(0.095)	0.009	0.039
19	1.58	0.10	0.048	(0.095)	0.009	0.039
20	1.67	0.10	0.048	(0.095)	0.009	0.039
21	1.75	0.10	0.048	(0.094)	0.009	0.039
22	1.83	0.13	0.064	(0.094)	0.012	0.052
23	1.92	0.13	0.064	(0.094)	0.012	0.052
24	2.00	0.13	0.064	(0.093)	0.012	0.052
25	2.08	0.13	0.064	(0.093)	0.012	0.052
26	2.17	0.13	0.064	(0.092)	0.012	0.052
27	2.25	0.13	0.064	(0.092)	0.012	0.052
28	2.33	0.13	0.064	(0.092)	0.012	0.052
29	2.42	0.13	0.064	(0.091)	0.012	0.052
30	2.50	0.13	0.064	(0.091)	0.012	0.052
31	2.58	0.17	0.080	(0.091)	0.014	0.066
32	2.67	0.17	0.080	(0.090)	0.014	0.066
33	2.75	0.17	0.080	(0.090)	0.014	0.066
34	2.83	0.17	0.080	(0.089)	0.014	0.066
35	2.92	0.17	0.080	(0.089)	0.014	0.066
36	3.00	0.17	0.080	(0.089)	0.014	0.066
37	3.08	0.17	0.080	(0.088)	0.014	0.066
38	3.17	0.17	0.080	(0.088)	0.014	0.066
39	3.25	0.17	0.080	(0.088)	0.014	0.066
40	3.33	0.17	0.080	(0.087)	0.014	0.066
41	3.42	0.17	0.080	(0.087)	0.014	0.066
42	3.50	0.17	0.080	(0.087)	0.014	0.066
43	3.58	0.17	0.080	(0.086)	0.014	0.066
44	3.67	0.17	0.080	(0.086)	0.014	0.066
45	3.75	0.17	0.080	(0.085)	0.014	0.066
46	3.83	0.20	0.096	(0.085)	0.017	0.079
47	3.92	0.20	0.096	(0.085)	0.017	0.079

48	4.00	0.20	0.096	(0.084)	0.017	0.079
49	4.08	0.20	0.096	(0.084)	0.017	0.079
50	4.17	0.20	0.096	(0.084)	0.017	0.079
51	4.25	0.20	0.096	(0.083)	0.017	0.079
52	4.33	0.23	0.112	(0.083)	0.020	0.092
53	4.42	0.23	0.112	(0.083)	0.020	0.092
54	4.50	0.23	0.112	(0.082)	0.020	0.092
55	4.58	0.23	0.112	(0.082)	0.020	0.092
56	4.67	0.23	0.112	(0.082)	0.020	0.092
57	4.75	0.23	0.112	(0.081)	0.020	0.092
58	4.83	0.27	0.128	(0.081)	0.023	0.105
59	4.92	0.27	0.128	(0.080)	0.023	0.105
60	5.00	0.27	0.128	(0.080)	0.023	0.105
61	5.08	0.20	0.096	(0.080)	0.017	0.079
62	5.17	0.20	0.096	(0.079)	0.017	0.079
63	5.25	0.20	0.096	(0.079)	0.017	0.079
64	5.33	0.23	0.112	(0.079)	0.020	0.092
65	5.42	0.23	0.112	(0.078)	0.020	0.092
66	5.50	0.23	0.112	(0.078)	0.020	0.092
67	5.58	0.27	0.128	(0.078)	0.023	0.105
68	5.67	0.27	0.128	(0.077)	0.023	0.105
69	5.75	0.27	0.128	(0.077)	0.023	0.105
70	5.83	0.27	0.128	(0.077)	0.023	0.105
71	5.92	0.27	0.128	(0.076)	0.023	0.105
72	6.00	0.27	0.128	(0.076)	0.023	0.105
73	6.08	0.30	0.144	(0.076)	0.026	0.118
74	6.17	0.30	0.144	(0.075)	0.026	0.118
75	6.25	0.30	0.144	(0.075)	0.026	0.118
76	6.33	0.30	0.144	(0.075)	0.026	0.118
77	6.42	0.30	0.144	(0.074)	0.026	0.118
78	6.50	0.30	0.144	(0.074)	0.026	0.118
79	6.58	0.33	0.160	(0.074)	0.029	0.131
80	6.67	0.33	0.160	(0.073)	0.029	0.131
81	6.75	0.33	0.160	(0.073)	0.029	0.131
82	6.83	0.33	0.160	(0.073)	0.029	0.131
83	6.92	0.33	0.160	(0.072)	0.029	0.131
84	7.00	0.33	0.160	(0.072)	0.029	0.131
85	7.08	0.33	0.160	(0.072)	0.029	0.131
86	7.17	0.33	0.160	(0.071)	0.029	0.131
87	7.25	0.33	0.160	(0.071)	0.029	0.131
88	7.33	0.37	0.176	(0.071)	0.032	0.144
89	7.42	0.37	0.176	(0.070)	0.032	0.144
90	7.50	0.37	0.176	(0.070)	0.032	0.144
91	7.58	0.40	0.192	(0.070)	0.035	0.157
92	7.67	0.40	0.192	(0.069)	0.035	0.157
93	7.75	0.40	0.192	(0.069)	0.035	0.157
94	7.83	0.43	0.208	(0.069)	0.037	0.171
95	7.92	0.43	0.208	(0.068)	0.037	0.171
96	8.00	0.43	0.208	(0.068)	0.037	0.171
97	8.08	0.50	0.240	(0.068)	0.043	0.197

98	8.17	0.50	0.240	(0.067)	0.043	0.197
99	8.25	0.50	0.240	(0.067)	0.043	0.197
100	8.33	0.50	0.240	(0.067)	0.043	0.197
101	8.42	0.50	0.240	(0.067)	0.043	0.197
102	8.50	0.50	0.240	(0.066)	0.043	0.197
103	8.58	0.53	0.256	(0.066)	0.046	0.210
104	8.67	0.53	0.256	(0.066)	0.046	0.210
105	8.75	0.53	0.256	(0.065)	0.046	0.210
106	8.83	0.57	0.272	(0.065)	0.049	0.223
107	8.92	0.57	0.272	(0.065)	0.049	0.223
108	9.00	0.57	0.272	(0.064)	0.049	0.223
109	9.08	0.63	0.304	(0.064)	0.055	0.249
110	9.17	0.63	0.304	(0.064)	0.055	0.249
111	9.25	0.63	0.304	(0.063)	0.055	0.249
112	9.33	0.67	0.320	(0.063)	0.058	0.262
113	9.42	0.67	0.320	(0.063)	0.058	0.262
114	9.50	0.67	0.320	(0.063)	0.058	0.262
115	9.58	0.70	0.336	(0.062)	0.060	0.276
116	9.67	0.70	0.336	(0.062)	0.060	0.276
117	9.75	0.70	0.336	(0.062)	0.060	0.276
118	9.83	0.73	0.352	0.061	(0.063)	0.291
119	9.92	0.73	0.352	0.061	(0.063)	0.291
120	10.00	0.73	0.352	0.061	(0.063)	0.291
121	10.08	0.50	0.240	(0.060)	0.043	0.197
122	10.17	0.50	0.240	(0.060)	0.043	0.197
123	10.25	0.50	0.240	(0.060)	0.043	0.197
124	10.33	0.50	0.240	(0.060)	0.043	0.197
125	10.42	0.50	0.240	(0.059)	0.043	0.197
126	10.50	0.50	0.240	(0.059)	0.043	0.197
127	10.58	0.67	0.320	(0.059)	0.058	0.262
128	10.67	0.67	0.320	(0.058)	0.058	0.262
129	10.75	0.67	0.320	(0.058)	0.058	0.262
130	10.83	0.67	0.320	(0.058)	0.058	0.262
131	10.92	0.67	0.320	(0.058)	0.058	0.262
132	11.00	0.67	0.320	0.057	(0.058)	0.263
133	11.08	0.63	0.304	(0.057)	0.055	0.249
134	11.17	0.63	0.304	(0.057)	0.055	0.249
135	11.25	0.63	0.304	(0.056)	0.055	0.249
136	11.33	0.63	0.304	(0.056)	0.055	0.249
137	11.42	0.63	0.304	(0.056)	0.055	0.249
138	11.50	0.63	0.304	(0.056)	0.055	0.249
139	11.58	0.57	0.272	(0.055)	0.049	0.223
140	11.67	0.57	0.272	(0.055)	0.049	0.223
141	11.75	0.57	0.272	(0.055)	0.049	0.223
142	11.83	0.60	0.288	(0.055)	0.052	0.236
143	11.92	0.60	0.288	(0.054)	0.052	0.236
144	12.00	0.60	0.288	(0.054)	0.052	0.236
145	12.08	0.83	0.400	0.054	(0.072)	0.346
146	12.17	0.83	0.400	0.053	(0.072)	0.347
147	12.25	0.83	0.400	0.053	(0.072)	0.347

148	12.33	0.87	0.416	0.053	(0.075)	0.363
149	12.42	0.87	0.416	0.053	(0.075)	0.363
150	12.50	0.87	0.416	0.052	(0.075)	0.364
151	12.58	0.93	0.448	0.052	(0.081)	0.396
152	12.67	0.93	0.448	0.052	(0.081)	0.396
153	12.75	0.93	0.448	0.052	(0.081)	0.396
154	12.83	0.97	0.464	0.051	(0.084)	0.413
155	12.92	0.97	0.464	0.051	(0.084)	0.413
156	13.00	0.97	0.464	0.051	(0.084)	0.413
157	13.08	1.13	0.544	0.051	(0.098)	0.493
158	13.17	1.13	0.544	0.050	(0.098)	0.494
159	13.25	1.13	0.544	0.050	(0.098)	0.494
160	13.33	1.13	0.544	0.050	(0.098)	0.494
161	13.42	1.13	0.544	0.050	(0.098)	0.494
162	13.50	1.13	0.544	0.049	(0.098)	0.495
163	13.58	0.77	0.368	0.049	(0.066)	0.319
164	13.67	0.77	0.368	0.049	(0.066)	0.319
165	13.75	0.77	0.368	0.049	(0.066)	0.319
166	13.83	0.77	0.368	0.048	(0.066)	0.320
167	13.92	0.77	0.368	0.048	(0.066)	0.320
168	14.00	0.77	0.368	0.048	(0.066)	0.320
169	14.08	0.90	0.432	0.048	(0.078)	0.384
170	14.17	0.90	0.432	0.047	(0.078)	0.385
171	14.25	0.90	0.432	0.047	(0.078)	0.385
172	14.33	0.87	0.416	0.047	(0.075)	0.369
173	14.42	0.87	0.416	0.047	(0.075)	0.369
174	14.50	0.87	0.416	0.046	(0.075)	0.370
175	14.58	0.87	0.416	0.046	(0.075)	0.370
176	14.67	0.87	0.416	0.046	(0.075)	0.370
177	14.75	0.87	0.416	0.046	(0.075)	0.370
178	14.83	0.83	0.400	0.045	(0.072)	0.355
179	14.92	0.83	0.400	0.045	(0.072)	0.355
180	15.00	0.83	0.400	0.045	(0.072)	0.355
181	15.08	0.80	0.384	0.045	(0.069)	0.339
182	15.17	0.80	0.384	0.045	(0.069)	0.339
183	15.25	0.80	0.384	0.044	(0.069)	0.340
184	15.33	0.77	0.368	0.044	(0.066)	0.324
185	15.42	0.77	0.368	0.044	(0.066)	0.324
186	15.50	0.77	0.368	0.044	(0.066)	0.324
187	15.58	0.63	0.304	0.043	(0.055)	0.261
188	15.67	0.63	0.304	0.043	(0.055)	0.261
189	15.75	0.63	0.304	0.043	(0.055)	0.261
190	15.83	0.63	0.304	0.043	(0.055)	0.261
191	15.92	0.63	0.304	0.042	(0.055)	0.261
192	16.00	0.63	0.304	0.042	(0.055)	0.262
193	16.08	0.13	0.064	(0.042)	0.012	0.052
194	16.17	0.13	0.064	(0.042)	0.012	0.052
195	16.25	0.13	0.064	(0.042)	0.012	0.052
196	16.33	0.13	0.064	(0.041)	0.012	0.052
197	16.42	0.13	0.064	(0.041)	0.012	0.052

198	16.50	0.13	0.064	(0.041)	0.012	0.052
199	16.58	0.10	0.048	(0.041)	0.009	0.039
200	16.67	0.10	0.048	(0.041)	0.009	0.039
201	16.75	0.10	0.048	(0.040)	0.009	0.039
202	16.83	0.10	0.048	(0.040)	0.009	0.039
203	16.92	0.10	0.048	(0.040)	0.009	0.039
204	17.00	0.10	0.048	(0.040)	0.009	0.039
205	17.08	0.17	0.080	(0.040)	0.014	0.066
206	17.17	0.17	0.080	(0.039)	0.014	0.066
207	17.25	0.17	0.080	(0.039)	0.014	0.066
208	17.33	0.17	0.080	(0.039)	0.014	0.066
209	17.42	0.17	0.080	(0.039)	0.014	0.066
210	17.50	0.17	0.080	(0.039)	0.014	0.066
211	17.58	0.17	0.080	(0.038)	0.014	0.066
212	17.67	0.17	0.080	(0.038)	0.014	0.066
213	17.75	0.17	0.080	(0.038)	0.014	0.066
214	17.83	0.13	0.064	(0.038)	0.012	0.052
215	17.92	0.13	0.064	(0.038)	0.012	0.052
216	18.00	0.13	0.064	(0.037)	0.012	0.052
217	18.08	0.13	0.064	(0.037)	0.012	0.052
218	18.17	0.13	0.064	(0.037)	0.012	0.052
219	18.25	0.13	0.064	(0.037)	0.012	0.052
220	18.33	0.13	0.064	(0.037)	0.012	0.052
221	18.42	0.13	0.064	(0.037)	0.012	0.052
222	18.50	0.13	0.064	(0.036)	0.012	0.052
223	18.58	0.10	0.048	(0.036)	0.009	0.039
224	18.67	0.10	0.048	(0.036)	0.009	0.039
225	18.75	0.10	0.048	(0.036)	0.009	0.039
226	18.83	0.07	0.032	(0.036)	0.006	0.026
227	18.92	0.07	0.032	(0.035)	0.006	0.026
228	19.00	0.07	0.032	(0.035)	0.006	0.026
229	19.08	0.10	0.048	(0.035)	0.009	0.039
230	19.17	0.10	0.048	(0.035)	0.009	0.039
231	19.25	0.10	0.048	(0.035)	0.009	0.039
232	19.33	0.13	0.064	(0.035)	0.012	0.052
233	19.42	0.13	0.064	(0.035)	0.012	0.052
234	19.50	0.13	0.064	(0.034)	0.012	0.052
235	19.58	0.10	0.048	(0.034)	0.009	0.039
236	19.67	0.10	0.048	(0.034)	0.009	0.039
237	19.75	0.10	0.048	(0.034)	0.009	0.039
238	19.83	0.07	0.032	(0.034)	0.006	0.026
239	19.92	0.07	0.032	(0.034)	0.006	0.026
240	20.00	0.07	0.032	(0.033)	0.006	0.026
241	20.08	0.10	0.048	(0.033)	0.009	0.039
242	20.17	0.10	0.048	(0.033)	0.009	0.039
243	20.25	0.10	0.048	(0.033)	0.009	0.039
244	20.33	0.10	0.048	(0.033)	0.009	0.039
245	20.42	0.10	0.048	(0.033)	0.009	0.039
246	20.50	0.10	0.048	(0.033)	0.009	0.039
247	20.58	0.10	0.048	(0.032)	0.009	0.039

248	20.67	0.10	0.048	(0.032)	0.009	0.039
249	20.75	0.10	0.048	(0.032)	0.009	0.039
250	20.83	0.07	0.032	(0.032)	0.006	0.026
251	20.92	0.07	0.032	(0.032)	0.006	0.026
252	21.00	0.07	0.032	(0.032)	0.006	0.026
253	21.08	0.10	0.048	(0.032)	0.009	0.039
254	21.17	0.10	0.048	(0.032)	0.009	0.039
255	21.25	0.10	0.048	(0.031)	0.009	0.039
256	21.33	0.07	0.032	(0.031)	0.006	0.026
257	21.42	0.07	0.032	(0.031)	0.006	0.026
258	21.50	0.07	0.032	(0.031)	0.006	0.026
259	21.58	0.10	0.048	(0.031)	0.009	0.039
260	21.67	0.10	0.048	(0.031)	0.009	0.039
261	21.75	0.10	0.048	(0.031)	0.009	0.039
262	21.83	0.07	0.032	(0.031)	0.006	0.026
263	21.92	0.07	0.032	(0.030)	0.006	0.026
264	22.00	0.07	0.032	(0.030)	0.006	0.026
265	22.08	0.10	0.048	(0.030)	0.009	0.039
266	22.17	0.10	0.048	(0.030)	0.009	0.039
267	22.25	0.10	0.048	(0.030)	0.009	0.039
268	22.33	0.07	0.032	(0.030)	0.006	0.026
269	22.42	0.07	0.032	(0.030)	0.006	0.026
270	22.50	0.07	0.032	(0.030)	0.006	0.026
271	22.58	0.07	0.032	(0.030)	0.006	0.026
272	22.67	0.07	0.032	(0.030)	0.006	0.026
273	22.75	0.07	0.032	(0.030)	0.006	0.026
274	22.83	0.07	0.032	(0.029)	0.006	0.026
275	22.92	0.07	0.032	(0.029)	0.006	0.026
276	23.00	0.07	0.032	(0.029)	0.006	0.026
277	23.08	0.07	0.032	(0.029)	0.006	0.026
278	23.17	0.07	0.032	(0.029)	0.006	0.026
279	23.25	0.07	0.032	(0.029)	0.006	0.026
280	23.33	0.07	0.032	(0.029)	0.006	0.026
281	23.42	0.07	0.032	(0.029)	0.006	0.026
282	23.50	0.07	0.032	(0.029)	0.006	0.026
283	23.58	0.07	0.032	(0.029)	0.006	0.026
284	23.67	0.07	0.032	(0.029)	0.006	0.026
285	23.75	0.07	0.032	(0.029)	0.006	0.026
286	23.83	0.07	0.032	(0.029)	0.006	0.026
287	23.92	0.07	0.032	(0.029)	0.006	0.026
288	24.00	0.07	0.032	(0.029)	0.006	0.026

(Loss Rate Not Used)

Sum = 100.0 Sum = 40.6

Flood volume = Effective rainfall 3.39(In)
times area 19.8(Ac.)/[(In)/(Ft.)] = 5.6(Ac.Ft)
Total soil loss = 0.61(In)
Total soil loss = 1.014(Ac.Ft)
Total rainfall = 4.00(In)
Flood volume = 243304.0 Cubic Feet
Total soil loss = 44180.9 Cubic Feet

Peak flow rate of this hydrograph = 9.875(CFS)

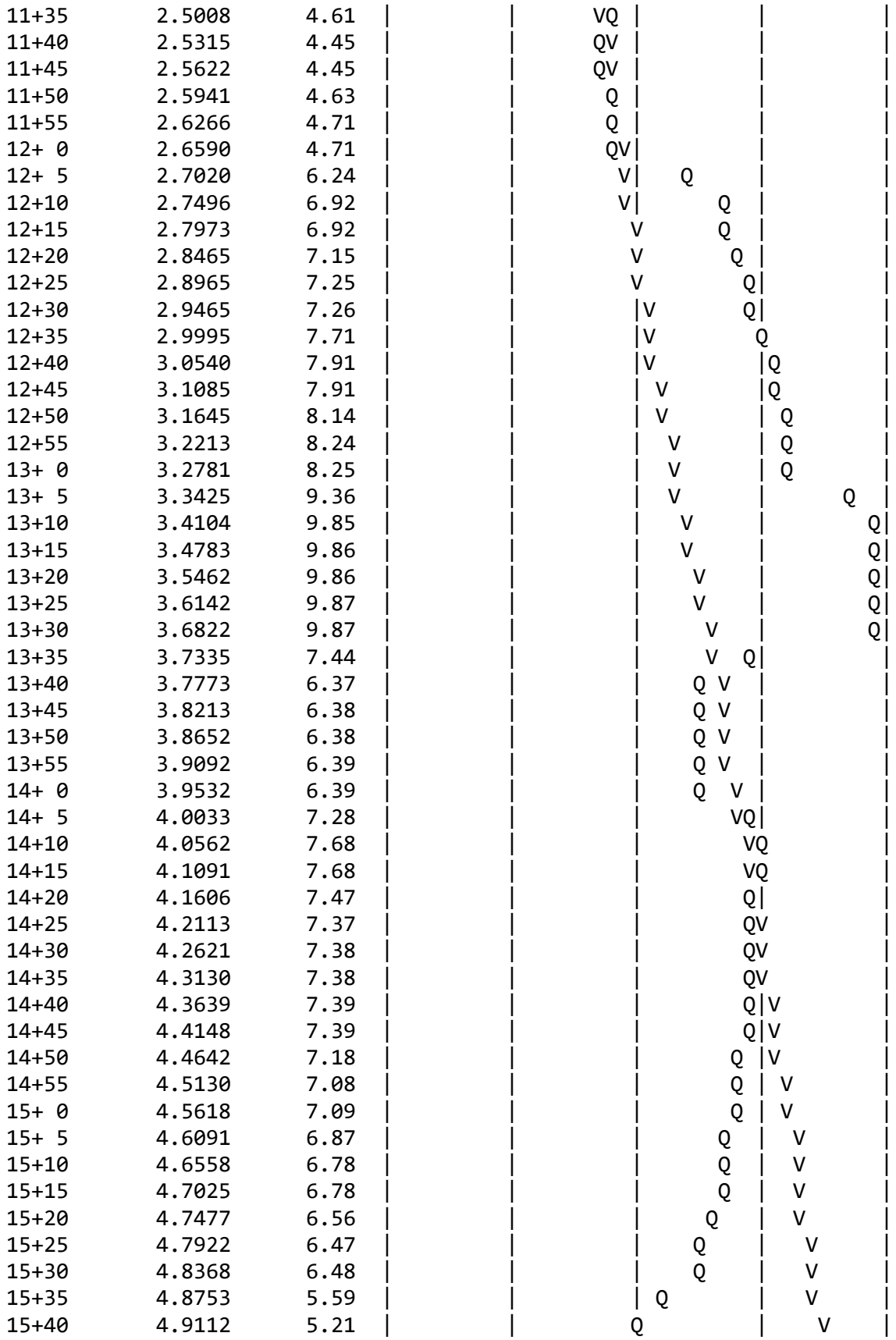
24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0 2.5 5.0 7.5 10.0
0+ 5	0.0025	0.36	VQ
0+10	0.0061	0.52	V Q
0+15	0.0097	0.52	V Q
0+20	0.0146	0.71	V Q
0+25	0.0200	0.79	V Q
0+30	0.0254	0.79	V Q
0+35	0.0308	0.79	V Q
0+40	0.0362	0.79	V Q
0+45	0.0416	0.79	V Q
0+50	0.0483	0.97	V Q
0+55	0.0555	1.05	V Q
1+ 0	0.0627	1.05	V Q
1+ 5	0.0687	0.87	V Q
1+10	0.0741	0.79	V Q
1+15	0.0795	0.79	V Q
1+20	0.0849	0.79	V Q
1+25	0.0903	0.79	V Q
1+30	0.0958	0.79	V Q
1+35	0.1012	0.79	V Q
1+40	0.1066	0.79	V Q
1+45	0.1120	0.79	V Q
1+50	0.1186	0.97	V Q
1+55	0.1259	1.05	V Q
2+ 0	0.1331	1.05	V Q
2+ 5	0.1403	1.05	|V Q
2+10	0.1475	1.05	|V Q
2+15	0.1547	1.05	|V Q
2+20	0.1619	1.05	|V Q
2+25	0.1692	1.05	|V Q
2+30	0.1764	1.05	|V Q
2+35	0.1848	1.23	|V Q
2+40	0.1939	1.31	|V Q
2+45	0.2029	1.31	|V Q
2+50	0.2119	1.31	|V Q
2+55	0.2209	1.31	|V Q
3+ 0	0.2299	1.31	|V Q
3+ 5	0.2390	1.31	|V Q
3+10	0.2480	1.31	|V Q

```
3+15       0.2570      1.31  |V   Q    |          |          |          |
3+20       0.2660      1.31  |V   Q    |          |          |          |
3+25       0.2750      1.31  |V   Q    |          |          |          |
3+30       0.2841      1.31  | V  Q    |          |          |          |
3+35       0.2931      1.31  | V  Q    |          |          |          |
3+40       0.3021      1.31  | V  Q    |          |          |          |
3+45       0.3111      1.31  | V  Q    |          |          |          |
3+50       0.3214      1.49  | V  Q    |          |          |          |
3+55       0.3322      1.57  | V   Q   |          |          |          |
4+ 0       0.3430      1.57  | V   Q   |          |          |          |
4+ 5       0.3539      1.57  | V   Q   |          |          |          |
4+10       0.3647      1.57  | V   Q   |          |          |          |
4+15       0.3755      1.57  | V   Q   |          |          |          |
4+20       0.3876      1.75  | V    Q  |          |          |          |
4+25       0.4002      1.83  | V    Q  |          |          |          |
4+30       0.4128      1.83  | V    Q  |          |          |          |
4+35       0.4255      1.83  |  V   Q  |          |          |          |
4+40       0.4381      1.83  |  V   Q  |          |          |          |
4+45       0.4507      1.83  |  V   Q  |          |          |          |
4+50       0.4646      2.02  |  V    Q |          |          |          |
4+55       0.4790      2.10  |  V    Q |          |          |          |
5+ 0       0.4935      2.10  |  V    Q |          |          |          |
5+ 5       0.5054      1.73  |  V  Q   |          |          |          |
5+10       0.5162      1.57  |  V  Q   |          |          |          |
5+15       0.5270      1.57  |  V  Q   |          |          |          |
5+20       0.5391      1.75  |  V   Q  |          |          |          |
5+25       0.5517      1.83  |  V   Q  |          |          |          |
5+30       0.5644      1.83  |   V  Q  |          |          |          |
5+35       0.5782      2.02  |   V   Q |          |          |          |
5+40       0.5927      2.10  |   V   Q |          |          |          |
5+45       0.6071      2.10  |   V   Q |          |          |          |
5+50       0.6215      2.10  |   V   Q |          |          |          |
5+55       0.6360      2.10  |   V   Q |          |          |          |
6+ 0       0.6504      2.10  |   V   Q |          |          |          |
6+ 5       0.6661      2.28  |   V    Q|          |          |          |
6+10       0.6823      2.36  |   V    Q|          |          |          |
6+15       0.6986      2.36  |    V   Q|          |          |          |
6+20       0.7148      2.36  |    V   Q|          |          |          |
6+25       0.7310      2.36  |    V   Q|          |          |          |
6+30       0.7473      2.36  |    V   Q|          |          |          |
6+35       0.7647      2.54  |    V    Q          |          |          |
6+40       0.7828      2.62  |    V    Q          |          |          |
6+45       0.8008      2.62  |    V    Q          |          |          |
6+50       0.8189      2.62  |    V    Q          |          |          |
6+55       0.8369      2.62  |    V    Q          |          |          |
7+ 0       0.8549      2.62  |     V   Q          |          |          |
7+ 5       0.8730      2.62  |     V   Q          |          |          |
7+10       0.8910      2.62  |     V   Q          |          |          |
7+15       0.9091      2.62  |     V   Q          |          |          |
7+20       0.9283      2.80  |     V   |Q         |          |          |
```

7+25	0.9482	2.88	V	Q			
7+30	0.9680	2.88	V	Q			
7+35	0.9891	3.06	V	Q			
7+40	1.0108	3.14	V	Q			
7+45	1.0324	3.14	V	Q			
7+50	1.0553	3.32	V	Q			
7+55	1.0788	3.41	V	Q			
8+ 0	1.1022	3.41	V	Q			
8+ 5	1.1282	3.77	V	Q			
8+10	1.1552	3.93	V	Q			
8+15	1.1823	3.93	V	Q			
8+20	1.2094	3.93	V	Q			
8+25	1.2364	3.93	V	Q			
8+30	1.2635	3.93	V	Q			
8+35	1.2918	4.11	V	Q			
8+40	1.3206	4.19	V	Q			
8+45	1.3495	4.19	V	Q			
8+50	1.3796	4.37	V	Q			
8+55	1.4103	4.45	V	Q			
9+ 0	1.4410	4.45	V	Q			
9+ 5	1.4741	4.82	V	Q			
9+10	1.5084	4.98	V	Q			
9+15	1.5427	4.98	V	Q			
9+20	1.5782	5.16	V	Q			
9+25	1.6143	5.24	V	Q			
9+30	1.6504	5.24	V	Q			
9+35	1.6877	5.42	V	Q			
9+40	1.7256	5.50	V	Q			
9+45	1.7634	5.50	V	Q			
9+50	1.8028	5.71	V	Q			
9+55	1.8428	5.81	V	Q			
10+ 0	1.8828	5.81	V	Q			
10+ 5	1.9138	4.51	V	Q			
10+10	1.9409	3.93	V Q				
10+15	1.9679	3.93	VQ				
10+20	1.9950	3.93	VQ				
10+25	2.0221	3.93	VQ				
10+30	2.0491	3.93	VQ				
10+35	2.0824	4.84	V	Q			
10+40	2.1185	5.24	V	Q			
10+45	2.1546	5.24	V	Q			
10+50	2.1907	5.24	V	Q			
10+55	2.2267	5.24	V	Q			
11+ 0	2.2628	5.24	V	Q			
11+ 5	2.2977	5.06	V	Q			
11+10	2.3320	4.98	V	Q			
11+15	2.3662	4.98	V	Q			
11+20	2.4005	4.98	V	Q			
11+25	2.4348	4.98	V	Q			
11+30	2.4691	4.98	V	Q			



15+45	4.9471	5.21	|	| Q |	| V |
15+50	4.9830	5.22	|	| Q |	| V |
15+55	5.0189	5.22	|	| Q |	| V |
16+ 0	5.0549	5.22	|	| Q |	| V |
16+ 5	5.0710	2.33	| Q |	| |	| V |
16+10	5.0782	1.05	| Q |	| |	| V |
16+15	5.0854	1.05	| Q |	| |	| V |
16+20	5.0926	1.05	| Q |	| |	| V |
16+25	5.0998	1.05	| Q |	| |	| V |
16+30	5.1070	1.05	| Q |	| |	| V |
16+35	5.1130	0.87	| Q |	| |	| V |
16+40	5.1184	0.79	| Q |	| |	| V |
16+45	5.1238	0.79	| Q |	| |	| V |
16+50	5.1292	0.79	| Q |	| |	| V |
16+55	5.1347	0.79	| Q |	| |	| V |
17+ 0	5.1401	0.79	| Q |	| |	| V |
17+ 5	5.1480	1.15	| Q |	| |	| V |
17+10	5.1570	1.31	| Q |	| |	| V |
17+15	5.1660	1.31	| Q |	| |	| V |
17+20	5.1750	1.31	| Q |	| |	| V |
17+25	5.1841	1.31	| Q |	| |	| V |
17+30	5.1931	1.31	| Q |	| |	| V |
17+35	5.2021	1.31	| Q |	| |	| V |
17+40	5.2111	1.31	| Q |	| |	| V |
17+45	5.2201	1.31	| Q |	| |	| V |
17+50	5.2279	1.13	| Q |	| |	| V |
17+55	5.2351	1.05	| Q |	| |	| V |
18+ 0	5.2423	1.05	| Q |	| |	| V |
18+ 5	5.2496	1.05	| Q |	| |	| V |
18+10	5.2568	1.05	| Q |	| |	| V |
18+15	5.2640	1.05	| Q |	| |	| V |
18+20	5.2712	1.05	| Q |	| |	| V |
18+25	5.2784	1.05	| Q |	| |	| V |
18+30	5.2856	1.05	| Q |	| |	| V |
18+35	5.2916	0.87	| Q |	| |	| V |
18+40	5.2970	0.79	| Q |	| |	| V |
18+45	5.3024	0.79	| Q |	| |	| V |
18+50	5.3066	0.60	| Q |	| |	| V |
18+55	5.3102	0.52	| Q |	| |	| V |
19+ 0	5.3138	0.52	| Q |	| |	| V |
19+ 5	5.3187	0.71	| Q |	| |	| V |
19+10	5.3241	0.79	| Q |	| |	| V |
19+15	5.3295	0.79	| Q |	| |	| V |
19+20	5.3361	0.97	| Q |	| |	| V |
19+25	5.3434	1.05	| Q |	| |	| V |
19+30	5.3506	1.05	| Q |	| |	| V |
19+35	5.3565	0.87	| Q |	| |	| V |
19+40	5.3619	0.79	| Q |	| |	| V |
19+45	5.3674	0.79	| Q |	| |	| V |
19+50	5.3715	0.60	| Q |	| |	| V |

19+55	5.3751	0.52	Q				V
20+ 0	5.3787	0.52	Q				V
20+ 5	5.3836	0.71	Q				V
20+10	5.3890	0.79	Q				V
20+15	5.3944	0.79	Q				V
20+20	5.3998	0.79	Q				V
20+25	5.4052	0.79	Q				V
20+30	5.4107	0.79	Q				V
20+35	5.4161	0.79	Q				V
20+40	5.4215	0.79	Q				V
20+45	5.4269	0.79	Q				V
20+50	5.4311	0.60	Q				V
20+55	5.4347	0.52	Q				V
21+ 0	5.4383	0.52	Q				V
21+ 5	5.4431	0.71	Q				V
21+10	5.4485	0.79	Q				V
21+15	5.4539	0.79	Q				V
21+20	5.4581	0.60	Q				V
21+25	5.4617	0.52	Q				V
21+30	5.4653	0.52	Q				V
21+35	5.4702	0.71	Q				V
21+40	5.4756	0.79	Q				V
21+45	5.4810	0.79	Q				V
21+50	5.4852	0.60	Q				V
21+55	5.4888	0.52	Q				V
22+ 0	5.4924	0.52	Q				V
22+ 5	5.4972	0.71	Q				V
22+10	5.5027	0.79	Q				V
22+15	5.5081	0.79	Q				V
22+20	5.5122	0.60	Q				V
22+25	5.5158	0.52	Q				V
22+30	5.5194	0.52	Q				V
22+35	5.5231	0.52	Q				V
22+40	5.5267	0.52	Q				V
22+45	5.5303	0.52	Q				V
22+50	5.5339	0.52	Q				V
22+55	5.5375	0.52	Q				V
23+ 0	5.5411	0.52	Q				V
23+ 5	5.5447	0.52	Q				V
23+10	5.5483	0.52	Q				V
23+15	5.5519	0.52	Q				V
23+20	5.5555	0.52	Q				V
23+25	5.5591	0.52	Q				V
23+30	5.5627	0.52	Q				V
23+35	5.5663	0.52	Q				V
23+40	5.5700	0.52	Q				V
23+45	5.5736	0.52	Q				V
23+50	5.5772	0.52	Q				V
23+55	5.5808	0.52	Q				V
24+ 0	5.5844	0.52	Q				V

```
   24+ 5       5.5855      0.16  Q         |         |         |        V|
-------------------------------------------------------------------------
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UNIT HYDROGRAPH HYDROLOGY MAPS

LEGEND

- DRAINAGE MANAGEMENT BOUNDARY
- FLOW DIRECTION
- L=14XX' LCA=1000' — LONGEST FLOW PATH CENTROIDAL LENGTH
- 101 / 14XX — NODE DESIGNATION NODE ELEVATION
- *14XX — *INVERT ELEVATION
- 5.0 / 1000' — WATERSHED AREA (ACRES) LONGEST WATER PATH (FT)
- CENTROID

TRUMBLE ROAD

SHERMAN ROAD

ETHANAC ROAD

102
1427.6

L=1376'
LCA=686'

19.8
1376'

101
1433.0

1" = 60'
30 0 60 120 180

CITY OF PERRIS

COUNTY OF RIVERSIDE
EXISTING UNIT HYDROGRAPH HYDROLOGY
ETHANAC LOGISTICS CENTER
P22-00030

SCALE:	1"=60'	ALBERT A. WEBB ASSOCIATES — ENGINEERING CONSULTANTS, 3788 McCRAY STREET, RIVERSIDE, CA. 92506, PH. (951) 686-1070, FAX (951) 788-1256	W.O. 2022-0198
DATE:	1/19/24		SHEET 1 OF 4 SHEETS
DESIGNED:	RSB		
CHECKED:	SKK		
PLN CK REF:			DWG. NO.
F.B.			

H:\2022\22-0198\DRAINAGE\HYD\DWG FOLDER\22-0198-PHYD-UH.DWG 1/19/2024 10:55:00 AM

REBECCA B

LEGEND

- DRAINAGE MANAGEMENT BOUNDARY
- FLOW DIRECTION
- L=14XX' / LCA=1000' — LONGEST FLOW PATH CENTROIDAL LENGTH
- 101 / 14XX — NODE DESIGNATION NODE ELEVATION
- *14XX — *INVERT ELEVATION
- 5.0 / 1000' — WATERSHED AREA (ACRES) LONGEST WATER PATH (FT)
- CENTROID

TRUMBLE ROAD

SHERMAN ROAD

ETHANAC ROAD

19.8
553'

202
1427.3

201
1434.0

L=553'
LCA=150'

N
W WEBB E
S

1" = 60'
30 0 60 120 180

CITY OF PERRIS

COUNTY OF RIVERSIDE
PROPOSED UNIT HYDROGRAPH HYDROLOGY
ETHANAC LOGISTICS CENTER
P22-00030

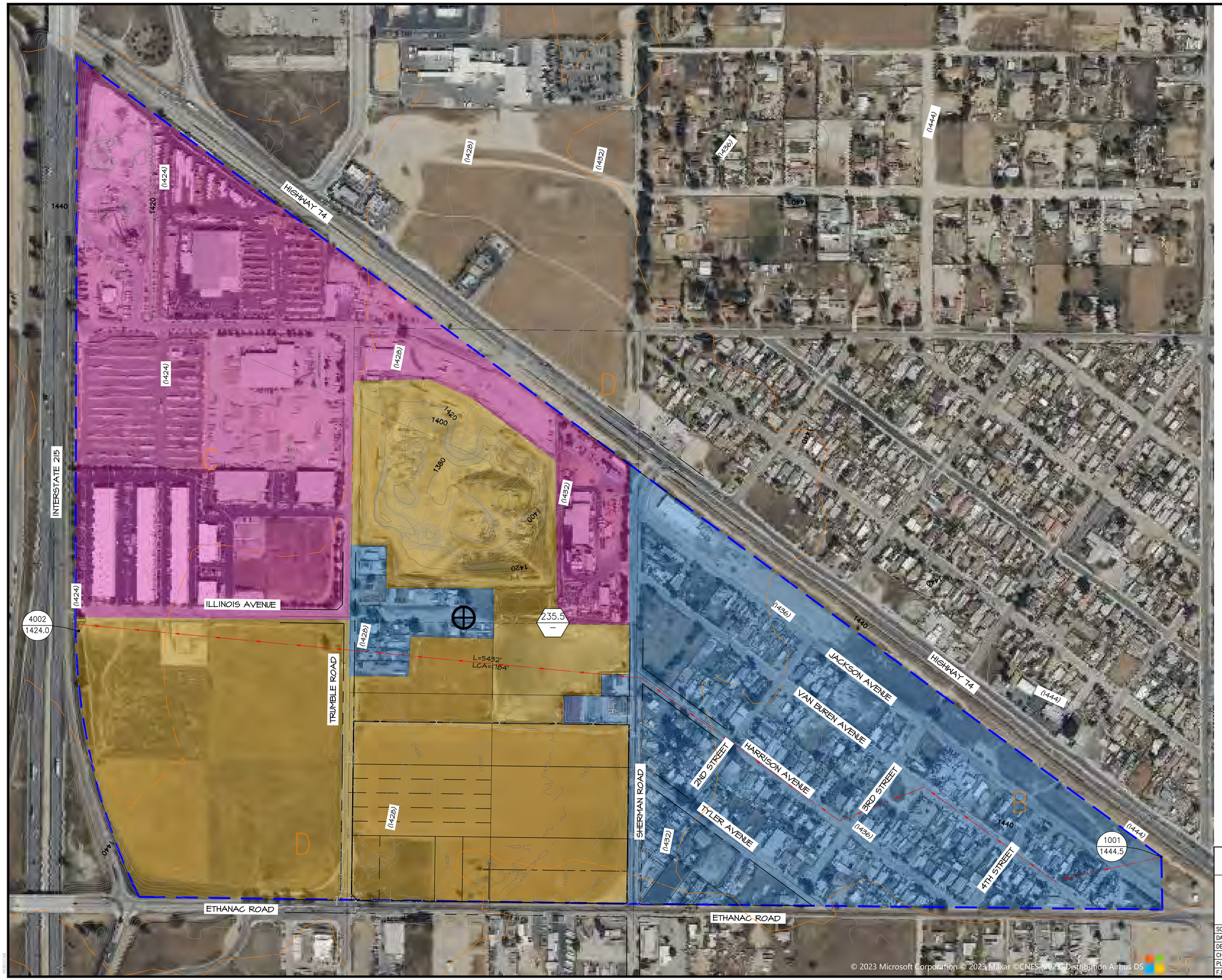
SCALE:	1"=60'
DATE:	1/19/24
DESIGNED:	RSB
CHECKED:	SKK
PLN CK REF:	
F.B.	

ALBERT A. WEBB ASSOCIATES
ENGINEERING CONSULTANTS
3788 McCRAY STREET
RIVERSIDE, CA. 92506
PH. (951) 686-1070
FAX (951) 788-1256

W.O.	2022-0198
SHEET	2
OF	4 SHEETS
DWG. NO.	

H:\2022\22-0198\DRAINAGE\HYD\DWG FOLDER\22-0198-PHYD-UH.DWG 1/19/2024 10:55:00 AM

BENCHMARK



LEGEND

- DRAINAGE MANAGEMENT BOUNDARY
- FLOW DIRECTION
- SOIL TYPE BOUNDARY
- L=14XX' / LCA=1000' — LONGEST FLOW PATH CENTROIDAL LENGTH
- 101 / 14xx — NODE DESIGNATION / NODE ELEVATION
- *14XX — *INVERT ELEVATION
- 5.0 / 1000' — WATERSHED AREA (ACRES) / LONGEST WATER PATH (FT)
- CENTROID
- COMMERCIAL / INDUSTRIAL
- UNDEVELOPED
- ¼ ACRE LOT RESIDENTIAL

N W E S

1" = 200'

100 0 200 400 600

CITY OF PERRIS

COUNTY OF RIVERSIDE
EXISTING UNIT HYDROGRAPH HYDROLOGY
ETHANAC LOGISTICS CENTER
P22-00030

SCALE:	1"=200'	ALBERT A. WEBB ASSOCIATES — ENGINEERING CONSULTANTS 3788 McCRAY STREET RIVERSIDE, CA. 92506 PH. (951) 686-1070 FAX (951) 788-1256	W.O. 2022-0198
DATE:	1/19/24		SHEET 3
DESIGNED:	RSB		OF 4 SHEETS
CHECKED:	SKK		
PLN CK REF:			DWG. NO.
F.B.			

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H:\2022\22-0198\DRAINAGE\HYD\DWG FOLDER\22-0198-PHYD-UH A-11.DWG 1/19/2024 10:52:46 AM

LEGEND

- DRAINAGE MANAGEMENT BOUNDARY
- FLOW DIRECTION
- SOIL TYPE BOUNDARY
- L=14XX' / LCA=1000' — LONGEST FLOW PATH CENTROIDAL LENGTH
- 101 / 14xx — NODE DESIGNATION / NODE ELEVATION
- *14XX — *INVERT ELEVATION
- 5.0 / 1000' — WATERSHED AREA (ACRES) / LONGEST WATER PATH (FT)
- CENTROID
- COMMERCIAL / INDUSTRIAL
- UNDEVELOPED
- ¼ ACRE LOT RESIDENTIAL

HIGHWAY 74

INTERSTATE 215

ILLINOIS AVENUE

TRUMBLE ROAD

SHERMAN ROAD

ETHANAC ROAD

JACKSON AVENUE

VAN BUREN AVENUE

HARRISON AVENUE

2ND STREET

3RD STREET

4TH STREET

TYLER AVENUE

75.8 —

L=3085'
LCA=1913'

4001
1429.0

3002
1427.5

5.4 —

L=536'
LCA=303'

3001
1431.5

4002
1424.0

1002
1431.3

65.6 —

88.6 —

L=2182'
LCA=1411'

2001
1433.0

L=2486'
LCA=1841'

1001
1444.5

A

B

C

D

1440

1420

1400

1380

N

W WEBB E

S

1" = 200'

100 0 200 400 600

CITY OF PERRIS

COUNTY OF RIVERSIDE
EXISTING UNIT HYDROGRAPH HYDROLOGY
ETHANAC LOGISTICS CENTER
P22-00030

SCALE:	1"=200'	ALBERT A. WEBB ASSOCIATES	W.O. 2022-0198
DATE:	1/19/24	ENGINEERING CONSULTANTS 3788 McCRAY STREET RIVERSIDE, CA. 92506 PH. (951) 686-1070 FAX (951) 788-1256	SHEET 4 OF 4 SHEETS
DESIGNED:	RSB		
CHECKED:	SKK		
PLN CK REF:			DWG. NO.
F.B.			

H:\2022\22-0198\DRAINAGE\HYD\DWG FOLDER\22-0198-PHYD-UH A-11.DWG 1/19/2024 10:52:46 AM

REBECCA B

APPENDIX B – HYDRAULIC ANALYSIS

CITY OF PERRIS LINE A WSPG CALCULATION

CITY OF PERRIS LINE A - MAIN LINE WSPG

Program Package Serial Number: 1585

WATER SURFACE PROFILE LISTING

Date: 9- 1-2023 Time:11:25:25

04-425 I-215 Business Park (Main Line)

Flows from Onsite Hydrology & Offsite Basin routing

31 May 2006 TD

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT or I.D.	Base Wt ZL	No Wth Prs/Pip	L/Elem	Ch Slope	"N"	X-Fall	ZR	SF Ave	HF	SE Dpth	Froude N	Norm Dp	Type Ch
1000.000	1416.000	4.000	1420.000	85.20	6.78	.71	1420.71	.00	2.80	.00	4.000	.000	.00	1	.0									
														21.990	.0028				.0030	.07	4.00	.00	3.40	PIPE
1021.990	1416.062	4.004	1420.066	85.20	6.78	.71	1420.78	.00	2.80	.00	4.000	.000	.00	1	.0									
														JUNCT STR	.0026				.0028	.01	4.00	.00		.012
1024.990	1416.070	4.163	1420.233	79.50	6.33	.62	1420.85	.00	2.70	.00	4.000	.000	.00	1	.0									
														36.970	.0028				.0026	.10	4.16	.00	3.17	PIPE

```
         |         |         |         |         |                |         |       |
       |         |       |       |       |
  1061.960  1416.173    4.157  1420.330     79.50    6.33     .62  1420.95     .00
 2.70      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    42.830    .0028                                        .0026      .11      .00
   .00    3.16    .012       .00   .00  PIPE
         |         |         |         |         |                |         |       |
       |         |       |       |       |
  1104.790  1416.293    4.217  1420.510     79.50    6.33     .62  1421.13     .00
 2.70      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    42.830    .0028                                        .0026      .11      .00
   .00    3.16    .012       .00   .00  PIPE
         |         |         |         |         |                |         |       |
       |         |       |       |       |
  1147.620  1416.413    4.333  1420.746     79.50    6.33     .62  1421.37     .00
 2.70      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    61.970    .0028                                        .0026      .16     4.33
   .00    3.16    .012       .00   .00  PIPE
         |         |         |         |         |                |         |       |
       |         |       |       |       |
  1209.590  1416.587    4.321  1420.908     79.50    6.33     .62  1421.53     .00
 2.70      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
 JUNCT STR   .0026                                        .0025      .01    4.32
  .00             .012       .00   .00  PIPE
         |         |         |         |         |                |         |       |
       |         |       |       |       |
  1212.590  1416.595    4.413  1421.008     76.20    6.06     .57  1421.58     .00
 2.64      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    23.960    .0028                                        .0024      .06     4.41
   .00    3.04    .012       .00   .00  PIPE
         |         |         |         |         |                |         |       |
       |         |       |       |       |
  1236.550  1416.662    4.403  1421.065     76.20    6.06     .57  1421.64     .00
 2.64      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
 JUNCT STR   .0030                                        .0022      .01    4.40
  .00             .012       .00   .00  PIPE
```

Program Package Serial Number: 1585

WATER SURFACE PROFILE LISTING

Date: 9- 1-2023 Time:11:25:25

04-425 I-215 Business Park (Main Line)

Flows from Onsite Hydrology & Offsite Basin routing

31 May 2006 TD

```
**********************************************************************************************
************************************ ********
          | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super
|Critical|Flow Top|Height/|Base Wt|      |No Wth
  Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev |
Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    -|
  L/Elem  |Ch Slope |        |         |         |         SF Ave|    HF   |SE
Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch

*********|*********|********|*********|*********|*******|*******|*********|*******|*
*******|********|*******|*******|***** |*******
          |         |        |         |         |               |         |       |
       |        |       |       |      |
  1239.550  1416.671    4.569  1421.240     68.80    5.47     .47  1421.71     .00
 2.51      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    |-
    39.720    .0028                                    .0020      .08     4.57
   .00    2.80    .012       .00   .00  PIPE
          |         |        |         |         |               |         |       |
       |        |       |       |      |
  1279.270  1416.782    4.535  1421.317     68.80    5.47     .47  1421.78     .00
 2.51      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    |-
 JUNCT STR   .0028                                    .0018      .01    4.54
  .00             .012       .00   .00  PIPE
          |         |        |         |         |               |         |       |
       |        |       |       |      |
  1286.770  1416.803    4.666  1421.469     62.90    5.01     .39  1421.86     .00
 2.39      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    |-
    69.580    .0028                                    .0016      .11     4.67
   .00    2.62    .012       .00   .00  PIPE
          |         |        |         |         |               |         |       |
       |        |       |       |      |
```

```
 1356.350  1416.998    4.585  1421.583     62.90    5.01     .39  1421.97     .00
 2.39      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
 JUNCT STR   .0026                                          .0013      .00    4.58
  .00             .012       .00   .00  PIPE
          |         |        |         |         |               |         |       |
       |        |       |       |      |
 1359.350  1417.006    4.790  1421.796     48.90    3.89     .24  1422.03     .00
 2.10      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
   209.024    .0029                                          .0010      .21     4.79
   .00    2.20    .012       .00   .00  PIPE
          |         |        |         |         |               |         |       |
       |        |       |       |      |
 1568.374  1417.610    4.392  1422.002     48.90    3.89     .24  1422.24     .00
 2.10      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
 JUNCT STR   .0376                                          .0009      .01    4.39
  .00             .012       .00   .00  PIPE
          |         |        |         |         |               |         |       |
       |        |       |       |      |
 1575.874  1417.892    4.210  1422.102     42.80    3.41     .18  1422.28     .00
 1.96      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    99.806    .0000                                          .0008      .08     4.21
   .00     .00    .012       .00   .00  PIPE
          |         |        |         |         |               |         |       |
       |        |       |       |      |
 1675.680  1417.892    4.285  1422.177     42.80    3.41     .18  1422.36     .00
 1.96      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
 JUNCT STR   .0027                                          .0010      .00    4.29
  .00             .012       .00   .00  PIPE
          |         |        |         |         |               |         |       |
       |        |       |       |      |
 1678.680  1417.900    4.252  1422.152     25.90    3.66     .21  1422.36     .00
 1.64      .00    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
   428.880    .0028                                          .0013      .55     4.25
   .00    1.81    .012       .00   .00  PIPE
```

WATER SURFACE PROFILE LISTING

Date: 9- 1-2023 Time:11:25:25

04-425 I-215 Business Park (Main Line)

Flows from Onsite Hydrology & Offsite Basin routing

31 May 2006 TD

```
**********************************************************************************************
************************************ ********
          | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super
|Critical|Flow Top|Height/|Base Wt|      |No Wth
  Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev |
Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    -|
  L/Elem  |Ch Slope |        |         |         |         SF Ave|    HF    |SE
Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch

*********|*********|********|*********|*********|*******|*******|*********|*******|*
*******|********|*******|*******|***** |*******
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  2107.560  1419.101    3.602  1422.703     25.90    3.66     .21  1422.91     .00
 1.64      .00    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    42.440    .0047                                        .0013      .05      .00
   .00    1.54    .012       .00   .00  PIPE
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  2150.000  1419.300    3.480  1422.780     25.90    3.66     .21  1422.99     .00
 1.64      .00    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
 JUNCT STR   .0033                                        .0007      .00     .00
  .00             .012       .00   .00  PIPE
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  2153.000  1419.310    3.609  1422.920      8.90    1.26     .02  1422.94     .00
  .94      .00    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    95.910    .0019                                        .0002      .01      .00
   .00    1.08    .012       .00   .00  PIPE
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  2248.910  1419.497    3.441  1422.938      8.90    1.26     .02  1422.96     .00
  .94      .00    3.000     .000   .00   1   .0
```

```
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    80.190    .0028                                    .0002      .01     3.44
   .00     .99    .012       .00   .00  PIPE
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  2329.100  1419.721    3.229  1422.950      8.90    1.26     .02  1422.97     .00
  .94      .00    3.000     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
 JUNCT STR   .0030                                    .0004      .00    3.23
  .00             .012       .00   .00  PIPE
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  2332.100  1419.730    3.215  1422.945      6.20    1.97     .06  1423.01     .00
  .88      .00    2.000     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
   287.510    .0028                                    .0006      .18     3.22
   .00     .97    .012       .00   .00  PIPE
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  2619.610  1420.535    2.594  1423.129      6.20    1.97     .06  1423.19     .00
  .88      .00    2.000     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
 JUNCT STR   .0026                                    .0005      .00    2.59
  .00             .012       .00   .00  PIPE
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  2622.610  1420.543    2.650  1423.193      4.30    1.37     .03  1423.22     .00
  .73      .00    2.000     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
   163.140    .0028                                    .0003      .05     2.65
   .00     .79    .012       .00   .00  PIPE
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  2785.750  1421.000    2.244  1423.244      4.30    1.37     .03  1423.27     .00
  .73      .00    2.000     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    19.800    .0028                                    .0003      .01      .00
   .00     .79    .012       .00   .00  PIPE
```

04-425 I-215 Business Park (Main Line)

Flows from Onsite Hydrology & Offsite Basin routing

31 May 2006 TD

```
**********************************************************************************
************************************ ********
          | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super
|Critical|Flow Top|Height/|Base Wt|      |No Wth
  Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev |
Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    -|
  L/Elem  |Ch Slope |        |         |         |         SF Ave|    HF    |SE
Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch

*********|*********|********|*********|*********|*******|*******|*********|*******|*
*******|********|*******|*******|***** |*******
          |         |        |         |         |               |         |       |
       |        |       |       |      |
  2805.550  1421.056    2.198  1423.254      4.30    1.37     .03  1423.28     .00
  .73      .00    2.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
```

CITY OF PERRIS LINE A - LATERAL M-1 WSPG

Program Package Serial Number: 1585

WATER SURFACE PROFILE LISTING

Date: 9- 1-2023 Time: 1:49:15

04-425 I-215 Business Park (LATERAL M-1)

Catch Basin #1

2022-12-20 RB

```
**********************************************************************************************
************************************ ********
          | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super
|Critical|Flow Top|Height/|Base Wt|      |No Wth
  Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev |
Depth   | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    -|
  L/Elem  |Ch Slope |        |         |         |         SF Ave|    HF   |SE
Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch

*********|*********|********|*********|*********|*******|*******|*********|*******|*
*******|********|*******|*******|***** |*******
         |         |        |         |         |               |         |       |
       |        |       |       |      |
     3.500  1417.290    2.940  1420.230      5.70    1.81     .05  1420.28     .00
  .84      .00    2.000     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
     6.810    .0088                                    .0005      .00     2.94
   .00     .68    .012       .00   .00  PIPE
         |         |        |         |               |         |       |
       |        |       |       |      |
    10.310  1417.350    2.884  1420.234      5.70    1.81     .05  1420.28     .00
  .84      .00    2.000     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
  WALL  ENTRANCE

         |         |        |         |         |               |         |       |
       |        |       |       |      |
    10.310  1417.350    2.959  1420.308      5.70     .28     .00  1420.31     .00
  .27     7.00    4.950    7.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
     3.000    .0167                                    .0000      .00     2.96
   .03     .17    .012       .00   .00  RECTANG
```

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          |         |        |         |         |                |         |       |
       |        |       |       |      |
    13.310  1417.400    2.909  1420.309      5.70     .28     .00  1420.31     .00
  .27     7.00    4.950    7.000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
```

CITY OF PERRIS LINE A - LATERAL M-2 WSPG

Program Package Serial Number: 1585

WATER SURFACE PROFILE LISTING

Date: 9- 1-2023 Time: 1:52: 5

04-425 I-215 Business Park (LATERAL M-2)

Catch Basin #2

2022-12-20 RB

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**********************************************************************************************
************************************ ********
          | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super
|Critical|Flow Top|Height/|Base Wt|      |No Wth
  Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev |
Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    -|
  L/Elem  |Ch Slope |        |         |         |         SF Ave|    HF   |SE
Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch

*********|*********|********|*********|*********|*******|*******|*********|*******|*
*******|********|*******|*******|***** |*******
         |         |        |         |         |               |         |       |
       |        |       |       |      |
     3.780  1418.080    3.390  1421.470      2.04    1.15     .02  1421.49     .00
  .54      .00    1.500     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    18.850    .0101                                    .0003      .01     3.39
   .00     .43    .012       .00   .00  PIPE
         |         |        |         |               |         |       |
       |        |       |       |      |
    22.630  1418.270    3.206  1421.476      2.04    1.15     .02  1421.50     .00
  .54      .00    1.500     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
  WALL  ENTRANCE

         |         |        |         |         |               |         |       |
       |        |       |       |      |
    22.630  1418.270    3.237  1421.507      2.04     .06     .00  1421.51     .00
  .11    10.00    5.000   10.000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
     3.000    .0100                                    .0000      .00     3.24
   .01     .09    .012       .00   .00  RECTANG
```

```
          |         |        |         |         |                |         |       |
       |        |       |       |      |
    25.630  1418.300    3.207  1421.507      2.04     .06     .00  1421.51     .00
  .11    10.00    5.000   10.000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
```

CITY OF PERRIS LINE A - LATERAL M-4 WSPG

Program Package Serial Number: 1585

WATER SURFACE PROFILE LISTING

Date: 9- 1-2023 Time: 1:54:37

04-425 I-215 Business Park (LATERAL M-4)

Catch Basin #4

2022-12-20 RB

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT or I.D.	Base Wt ZL	No Wth Prs/Pip	L/Elem	Ch Slope	"N"	X-Fall	ZR	SF Ave HF	SE Dpth	Froude N	Norm Dp	Type Ch
3.780	1418.890	3.212	1422.102	1.45	.82	.01	1422.11	.00	.45	.00	1.500	.000	.00	1	.0								
18.850	.0095						.0002	.00	3.21	.00	.37	.012	.00	.00	PIPE								
22.630	1419.070	3.035	1422.105	1.45	.82	.01	1422.12	.00	.45	.00	1.500	.000	.00	1	.0								
WALL	ENTRANCE																						
22.630	1419.070	3.051	1422.121	1.45	.05	.00	1422.12	.00	.09	10.00	4.200	10.000	.00	0	.0								
3.000	.0100						.0000	.00	3.05	.00	.07	.012	.00	.00	RECTANG								

```
          |         |        |         |         |                |         |       |
       |        |       |       |      |
    25.630  1419.100    3.021  1422.121      1.45     .05     .00  1422.12     .00
  .09    10.00    4.200   10.000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
```

LINE 4 - WSPG

Program Package Serial Number: 1585

WATER SURFACE PROFILE LISTING

Date: 9- 1-2023 Time: 1:29: 5

ETHANAC LOGISTICS CENTER

22-0198 LINE 4 WSPG

2023-09-01 RSB

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************************************ ********
          | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super
|Critical|Flow Top|Height/|Base Wt|      |No Wth
  Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev |
Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    -|
  L/Elem  |Ch Slope |        |         |         |         SF Ave|    HF   |SE
Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch

*********|*********|********|*********|*********|*******|*******|*********|*******|*
*******|********|*******|*******|***** |*******
         |         |        |         |         |               |         |       |
        |        |       |       |       |
  1000.000  1421.800    3.620  1425.420     19.20    2.72     .11  1425.53     .00
 1.40      .00    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    38.100    .0029                                        .0008      .03     3.62
   .00    1.56    .013       .00   .00  PIPE
         |         |        |         |         |               |         |       |
        |        |       |       |       |
  1038.100  1421.910    3.542  1425.452     19.20    2.72     .11  1425.57     .00
 1.40      .00    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    78.440    .0031                                        .0008      .06      .00
   .00    1.54    .013       .00   .00  PIPE
         |         |        |         |         |               |         |       |
        |        |       |       |       |
  1116.540  1422.150    3.390  1425.540     19.20    2.72     .11  1425.65     .00
 1.40      .00    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
   180.066    .0030                                        .0008      .15     3.39
   .00    1.55    .013       .00   .00  PIPE
```

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         |        |       |        |         |               |         |       |
       |       |       |       |       |
  1296.606  1422.689    3.000  1425.689     19.20    2.72     .11  1425.80     .00
 1.40      .00    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
   119.930    .0030                                        .0008      .09     3.00
   .00    1.55    .013       .00   .00  PIPE
         |        |       |        |         |               |         |       |
       |       |       |       |       |
  1416.536  1423.047    2.721  1425.769     19.20    2.85     .13  1425.89     .00
 1.40     1.74    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    66.196    .0030                                        .0008      .05     2.72
   .26    1.55    .013       .00   .00  PIPE
         |        |       |        |         |               |         |       |
       |       |       |       |       |
  1482.733  1423.245    2.560  1425.806     19.20    2.99     .14  1425.94     .00
 1.40     2.12    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    54.656    .0030                                        .0008      .04     2.56
   .30    1.55    .013       .00   .00  PIPE
         |        |       |        |         |               |         |       |
       |       |       |       |       |
  1537.388  1423.409    2.427  1425.836     19.20    3.13     .15  1425.99     .00
 1.40     2.36    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    27.012    .0030                                        .0009      .02     2.43
   .34    1.55    .013       .00   .00  PIPE
         |        |       |        |         |               |         |       |
       |       |       |       |       |
  1564.400  1423.490    2.362  1425.852     19.20    3.22     .16  1426.01     .00
 1.40     2.46    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
 JUNCT STR   .0067                                        .0008      .00    2.36
  .36             .013       .00   .00  PIPE
         |        |       |        |         |               |         |       |
       |       |       |       |       |
  1567.400  1423.510    2.377  1425.887     18.20    3.03     .14  1426.03     .00
 1.37     2.43    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    20.020    .0025                                        .0008      .02     2.38
   .34    1.58    .013       .00   .00  PIPE
```

Program Package Serial Number: 1585

WATER SURFACE PROFILE LISTING

Date: 9- 1-2023 Time: 1:29: 5

ETHANAC LOGISTICS CENTER

22-0198 LINE 4 WSPG

2023-09-01 RSB

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**********************************************************************************************
************************************ ********
          | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super
|Critical|Flow Top|Height/|Base Wt|      |No Wth
  Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev |
Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    -|
  L/Elem  |Ch Slope |        |         |         |         SF Ave|    HF   |SE
Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch

*********|*********|********|*********|*********|*******|*******|*********|*******|*
*******|********|*******|*******|***** |*******
          |         |        |         |         |               |         |       |
       |        |       |       |      |
  1587.420  1423.560    2.338  1425.898     18.20    3.08     .15  1426.05     .00
 1.37     2.49    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    |-
 JUNCT STR   .0033                                        .0020      .01    2.34
  .35             .013       .00   .00  PIPE
          |         |        |         |         |               |         |       |
       |        |       |       |      |
  1590.420  1423.570    2.287  1425.857     12.70    4.04     .25  1426.11     .00
 1.28      .00    2.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    |-
    37.180    .0030                                        .0032      .12     2.29
   .00    1.70    .013       .00   .00  PIPE
          |         |        |         |         |               |         |       |
       |        |       |       |      |
  1627.600  1423.680    2.294  1425.974     12.70    4.04     .25  1426.23     .00
 1.28      .00    2.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    |-
 JUNCT STR   .0037                                        .0004      .01    2.29
  .00             .013       .00   .00  PIPE
                       ------------------- WARNING - Junction Analysis - Change in
Channel Type ---------------
```
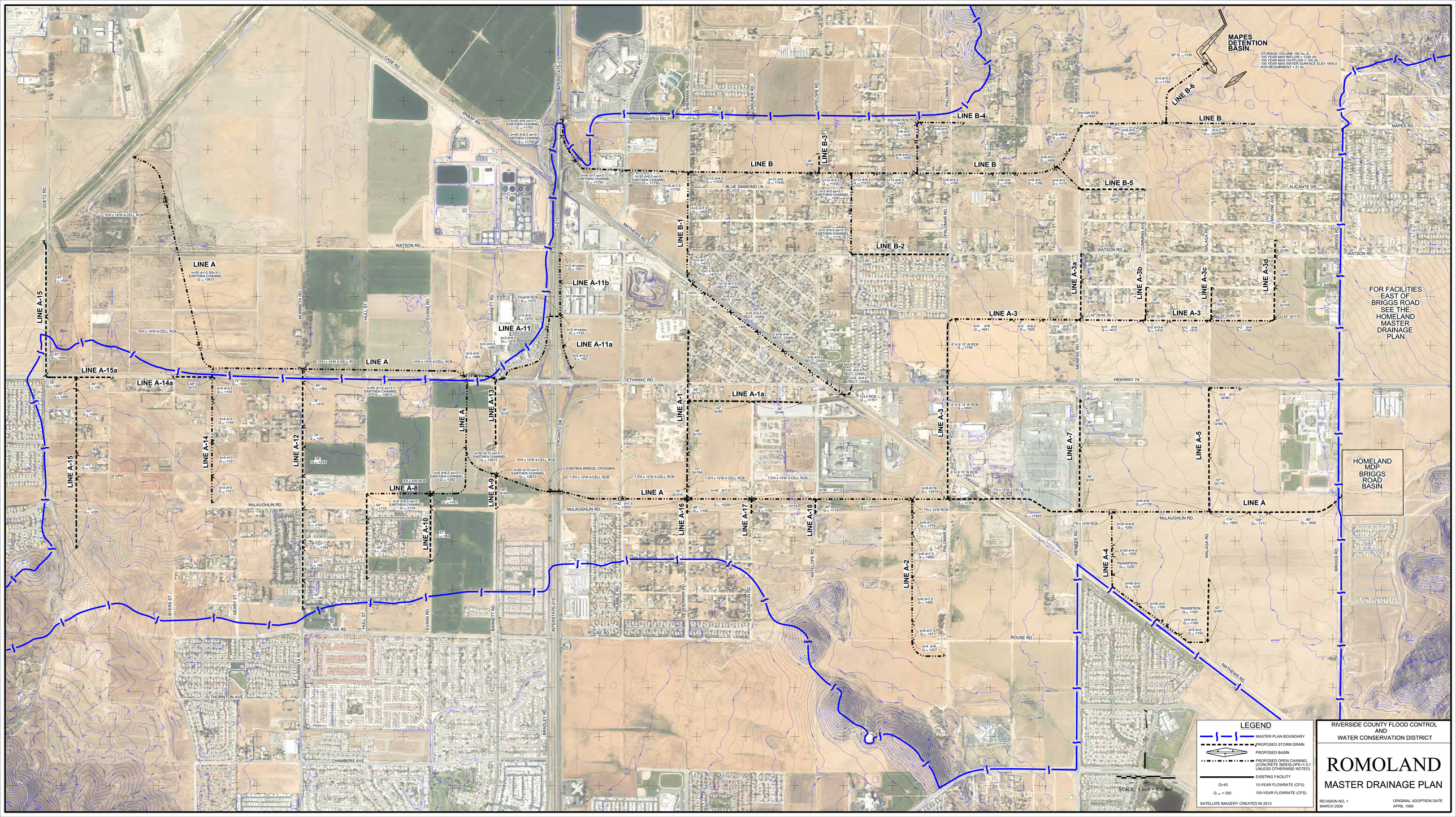

```
         |         |        |         |         |                |         |       |
       |        |       |       |      |
  1643.610  1423.740    2.534  1426.274      2.70    1.20     .02  1426.30     .00
   .47     1.50    1.500    1.500   .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    53.890    .0028                                        .0004      .02     2.53
   .17     .62    .013       .00   .00  BOX
         |         |        |         |         |                |         |       |
       |        |       |       |      |
  1697.500  1423.890    2.406  1426.296      2.70    1.20     .02  1426.32     .00
   .47     1.50    1.500    1.500   .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    45.230    .0031                                        .0004      .02      .00
   .17     .59    .013       .00   .00  BOX
         |         |        |         |         |                |         |       |
       |        |       |       |      |
  1742.730  1424.030    2.289  1426.319      2.70    1.20     .02  1426.34     .00
   .47     1.50    1.500    1.500   .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
     4.500    .0031                                        .0004      .00     2.29
   .17     .59    .013       .00   .00  BOX
         |         |        |         |         |                |         |       |
       |        |       |       |      |
  1747.230  1424.044    2.277  1426.321      2.70    1.20     .02  1426.34     .00
   .47     1.50    1.500    1.500   .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
```

APPENDIX C – REFERENCES

ROMOLAND MASTER DRAINAGE PLAN


MAPES DETENTION BASIN
STORAGE VOLUME =92 Ac.-ft.
100 YEAR MAX INFLOW = 1230 cfs
100 YEAR MAX OUTFLOW = 150 cfs
100 YEAR MAX WATER SURFACE ELEV 1604.5
R/W REQUIRMENT = 21 Ac.
LINE A
LINE A-1
LINE A-1a
LINE A-2
LINE A-3
LINE A-3a
LINE A-3b
LINE A-3c
LINE A-3d
LINE A-4
LINE A-5
LINE A-7
LINE A-8
LINE A-9
LINE A-10
LINE A-11
LINE A-11a
LINE A-11b
LINE A-12
LINE A-13
LINE A-14
LINE A-14a
LINE A-15
LINE A-15a
LINE A-16
LINE A-17
LINE A-18
LINE B
LINE B-1
LINE B-2
LINE B-3
LINE B-4
LINE B-5
LINE B-6
MAPES RD.
WATSON RD.
ETHANAC RD.
McLAUGHLIN RD.
ROUSE RD.
HIGHWAY 74
MATHEWS RD.
ALICANTE DR.
INTERSTATE-215
I-215
CASE RD.
BNASF RR
GOETZ RD.
MURRIETA RD.
HULL ST.
EVANS RD.
BARNETT RD.
ENCANTO DR.
BLUE DIAMOND LN.
PALOMAR RD.
MENIFEE RD.
MALONE AVE.
CUMMING AVE.
MALAGA RD.
BRIGGS RD.
ANTELOPE RD.
SHERMAN RD.
DAWSON RD.
PALMER RD.
TRUMBLE RD.
BYERS ST.
GEARY ST.
THORNTON AVE.
CHAMBERS AVE.
BRADLEY RD.
EXISTING BRIDGE CROSSING
TRANSITION
FOR FACILITIES EAST OF BRIGGS ROAD SEE THE HOMELAND MASTER DRAINAGE PLAN
HOMELAND MDP BRIGGS ROAD BASIN
LEGEND
MASTER PLAN BOUNDARY
PROPOSED STORM DRAIN
PROPOSED BASIN
PROPOSED OPEN CHANNEL (CONCRETE SIDESLOPE=1.5:1 UNLESS OTHERWISE NOTED)
EXISTING FACILITY
Q=45 10-YEAR FLOWRATE (CFS)
Q100 = 350 100-YEAR FLOWRATE (CFS)
SATELLITE IMAGERY CREATED IN 2013
SCALE: 1 inch = 600 feet
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
ROMOLAND
MASTER DRAINAGE PLAN
REVISION NO. 1
MARCH 2006
ORIGINAL ADOPTION DATE
APRIL 1988

ILLINOIS AVENUE LINE A STORM DRAIN PLAN P8-921

STORM DRAIN IMPROVEMENT PLANS FOR:

CLASSIC PACIFIC BUSINESS PARK (PM 34082)

IN THE CITY OF PERRIS, CALIFORNIA

STORM DRAIN 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 MEMORANDUM OF UNDERSTANDING STANDARD SPECIFICATIONS DATED SEPTEMBER 1984 AND DESIGN MANUAL STANDARD DRAWINGS DATED MAY 1971.
2. ALL STATIONING REFERS TO THE CENTERLINE OF CONSTRUCTION UNLESS OTHERWISE NOTED.
3. STATIONING FOR LATERALS AND CONNECTOR PIPES REFER TO THE CENTERLINE– CENTERLINE INTERSECTION STATION, UNLESS OTHERWISE NOTED.
4. FORTY–EIGHT HOURS BEFORE EXCAVATION, CALL UNDERGROUND SERVICE ALERT 1–800–227–2600.
5. ALL ELEVATIONS SHOWN ARE IN FEET AND DECIMALS THEREOF BASED ON U.S.C. & G.S. DATUM.
6. ALL CROSS SECTIONS ARE TAKEN LOOKING DOWNSTREAM.
7. ELEVATIONS OF UTILITIES ARE APPROXIMATE UNLESS OTHERWISE NOTED.
8. OPENINGS RESULTING FROM THE CUTTING OR PARTIAL REMOVAL OF EXISTING CULVERTS, PIPES, OR SIMILAR STRUCTURES TO BE ABANDONED SHALL BE SEALED WITH 8" OF CLASS "B" CONCRETE.
9. "V" IS THE DEPTH OF INLET OF CATCH BASINS MEASURED FROM THE TOP OF CURB TO THE INVERT OF THE CONNECTOR PIPE.
10. 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.
11. ROAD CLOSURES SHALL BE PERMITTED FOR A SHORT PERIOD ONLY. THE CONTRACTOR IS TO SUBMIT A DETOUR PLAN TO THE CITY ENGINEER FOR APPROVAL AND PLACE SIGNS PER APPROVED PLANS PRIOR TO BEGINNING CONSTRUCTION.
12. VIDEO OF STORM DRAIN FACILITIES SHOWN ON THESE PLANS MUST BE SUBMITTED TO CITY ENGINEER FOR REVIEW.
13. TRAFFIC CONTROL PLAN SHALL BE SUBMITTED TO THE CITY ENGINEER FOR REVIEW AND APPROVAL.
14. ALL MANHOLE COVERS FOR STORM DRAIN LOCATED OUTSIDE OF DEDICATED RIGHT–OF–WAY SHALL BE LOCKED PRESSURE TYPE, AND SHALL READ "CITY OF PERRIS S.D."
15. VIDEO OF ALL ON–SITE AND OFF–SITE STORM DRAIN SHALL BE SUBMITTED TO CITY ENGINEER FOR REVIEW AND APPROVAL.

NOTICE TO CONTRACTOR:

THE EXISTENCE AND LOCATIONS OF ALL UNDERGROUND UTILITIES (UTILITY PIPES, STRUCTURES, ETC.) SHOWN ON THESE PLANS (MAIN LINES ONLY – NO SERVICE LATERALS) WERE ASCERTAINED BY A REVIEW OF RECORDS PROVIDED BY THESE MEMBER AGENCIES AND ARE APPROXIMATE. NEITHER THE OWNER NOR THE ENGINEER ASSUMES ANY RESPONSIBILITY FOR UTILITIES NOT SHOWN OR NOT IN THE LOCATION SHOWN.

THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO PROTECT THE UTILITY LINES SHOWN AND ANY OTHER LINES NOT OF RECORD OR NOT SHOWN ON THESE PLANS. LOCATIONS OF UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO COMMENCEMENT OF CONSTRUCTION.

BASIS OF BEARINGS

BASIS OF BEARING IS THE CENTERLINE OF PERRIS BOULEVARD TAKEN AS N00°16'30"E, AS SHOWN BY AMENDED PARCEL MAP 16950 PER P.M. 113/62–70, RECORDS OF RIVERSIDE COUNTY, CALIFORNIA.

NOTE

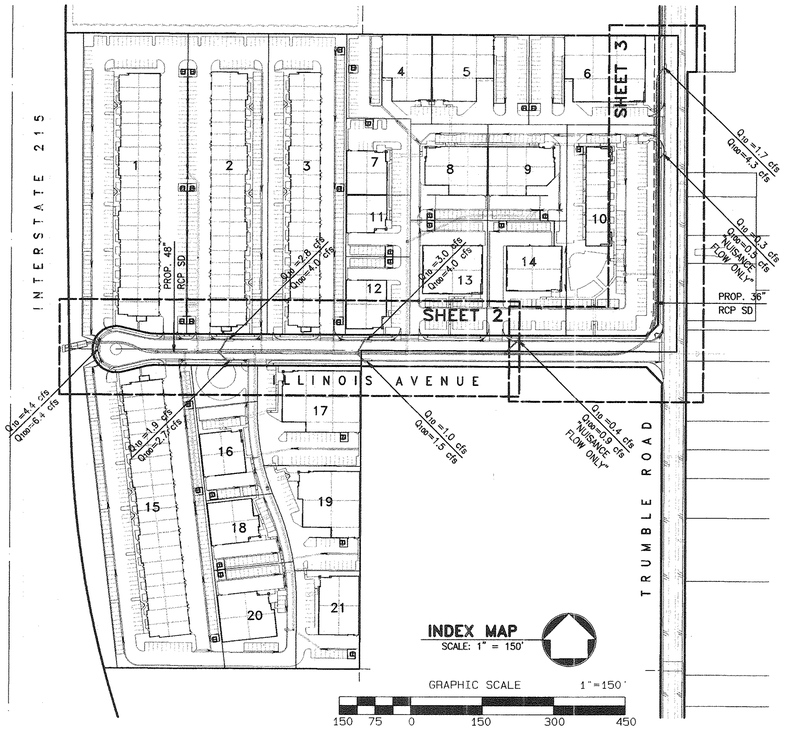
ALL ON–SITE STORM DRAIN AND PRIVATE LATERALS REFERRED TO ON THESE PLANS ARE TO BE CONSTRUCTED PER SEPARATE ON–SITE DRAINAGE PLANS AND CONCURRENTLY WITH PUBLIC STORM DRAIN SHOWN HEREON.

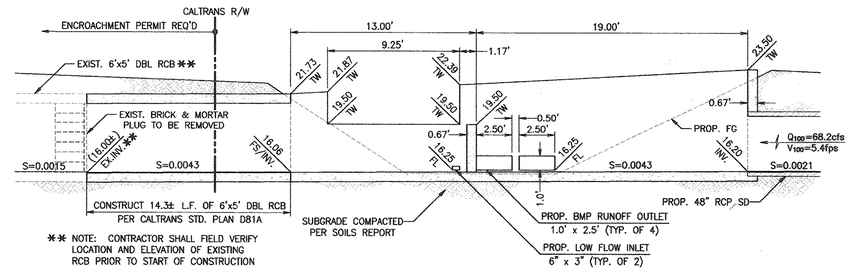
CONSTRUCTION NOTES

		QUANTITIES	
(1)	INSTALL 48" RCP, D–LOAD PER PLAN	661	LF
(2)	INSTALL 36" RCP, D–LOAD PER PLAN	638	LF
(3)	INTENTIONALLY LEFT BLANK	–	–
(4)	INSTALL 24" RCP, D–LOAD PER PLAN	437	LF
(5)	INSTALL 18" RCP, D–LOAD PER PLAN	180	LF
(6)	CONSTRUCT CURB OPENING CATCH BASIN PER APWA STD. PLAN 300–2 (H=4" – W NOTED ON PLANS)	5	EA
(7)	CONSTRUCT LOCAL DEPRESSION PER AWA STD. PLAN 313–1 CASE B	5	EA
(8)	CONSTRUCT MANHOLE NO. 2 PER RCFCD STD. DWG. NO. MH252	4	EA
(9)	CONSTRUCT MANHOLE NO. 4 PER RCFCD STD. DWG. NO. MH254	1	EA
(10)	INTENTIONALLY LEFT BLANK	–	–
(11)	CONSTRUCT MANHOLE NO. 1 PER RCFCD STD. DWG. NO. MH251	1	EA
(12)	CONSTRUCT JUNCTION STRUCTURE NO. 2 PER RCFCD STD. DWG. NO. JS227	4	EA
(13)	CONSTRUCT TRANSITION STRUCTURE NO. 3 PER RCFCD STD. DWG. NO. TS303	2	EA
(14)	CONSTRUCT JUNCTION STRUCTURE NO. 4 PER RCFCD STD. DWG. NO. JS229	2	EA

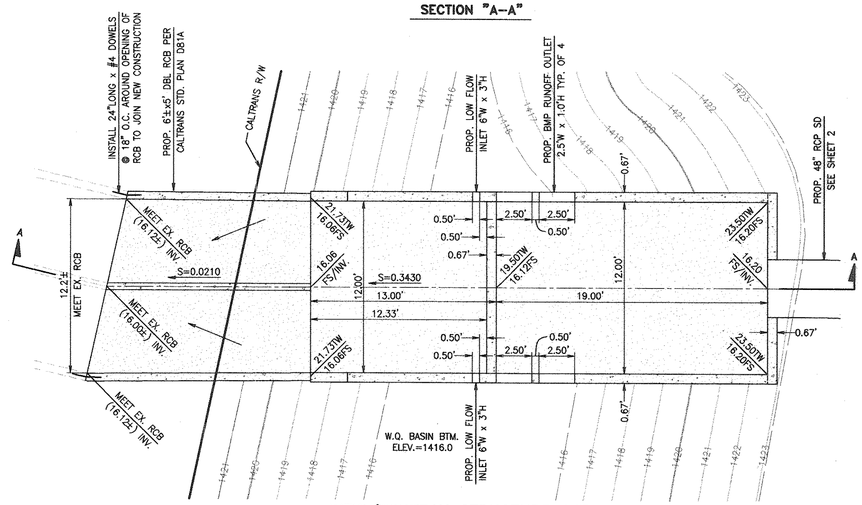
AS BUILT
THESE PLANS REFLECT ANY SUBSTANTIAL DESIGN MODIFICATIONS AS PROVIDED TO WEBB ASSOCIATES BY THE CONTRACTOR.
SCOTT R. HILDEBRANDT R.C.E. C44762 — DATE 9/30/08

REGISTERED PROFESSIONAL ENGINEER SCOTT R. HILDEBRANDT NO. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA



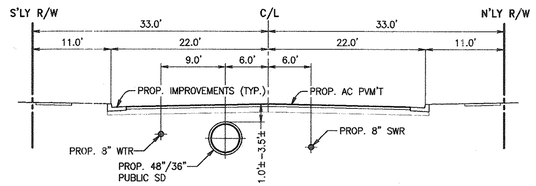


SECTION "A–A"



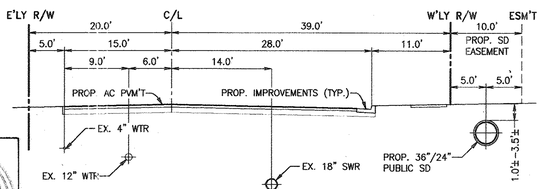
WEIR/FOREBAY STRUCTURE DETAIL

SCALE: 1" = 5'



UNDERGROUND UTILITIES TYPICAL SECTION ILLINOIS AVENUE

NOT TO SCALE

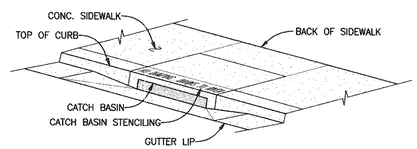


UNDERGROUND UTILITIES TYPICAL SECTION TRUMBLE ROAD

NOT TO SCALE

LIST OF ABBREVIATIONS

AB	AGGREGATE BASE
AC	ASPHALT CONCRETE
APWA	AMERICAN PUBLIC WORKS ASSOCIATION
BC	BEGINNING OF CURVE
BCR	BEGINNING OF CURVE RETURN
BTM	BOTTOM
BVC	BEGINNING OF VERTICAL CURVE
CB	CATCH BASIN
C/L	CENTERLINE
C&G	CURB & GUTTER
EC	END OF CURVE
ECC.	ECCENTRIC
ECR	END OF CURVE RETURN
ESMT	EASEMENT
EVC	END OF VERTICAL CURVE
FH	FIRE HYDRANT
FL	FLOWLINE
FS	FINISH SURFACE
HDPE	HIGH DENSITY POLYETHYLENE PIPE
HP	HIGH POINT
INV	INVERT ELEVATION
JS	JUNCTION STRUCTURE
LAT.	LATERAL
LF	LINEAR FEET
LP	LOW POINT
MC	MEDIAN CURB
MH	MANHOLE
MVC	MIDDLE OF VERTICAL CURVE
NTS	NOT TO SCALE
PCC	PORTLAND CEMENT CONCRETE
PRC	POINT OF REVERSE CURVE
RCP	REINFORCED CONCRETE PIPE
RED.	REDUCER
R/W	RIGHT OF WAY
SCE	SOUTHERN CALIFORNIA EDISON
SEP.	SEPARATE
S/W	SIDEWALK
TC	TOP OF CURB
TS	TRANSITION STRUCTURE
XING	CROSSING



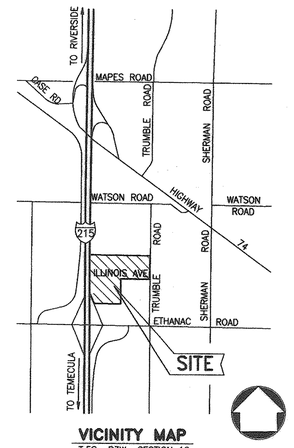
CATCH BASIN STENCILING DETAIL

NOT TO SCALE

A. STENCILS TO HAVE 2" LETTERS AS FOLLOW:
   NO DUMPING
   DRAINS TO RIVER
B. PLACE BOTH STENCILS CENTERED WITHIN THE CATCHBASIN OPENING AND WITHIN THE TOP OF CURB.
C. SPRAY BOTH STENCILS WITH WHITE PAINT.
D. REMOVE STENCILS WHEN PAINT IS DRY.

INDEX OF SHEETS

SHEET 1	TITLE SHEET
SHEET 2	STA 10+00 TO 19+00 – PLAN & PROFILE
SHEET 3	STA 19+00 TO 28+06 – PLAN & PROFILE



VICINITY MAP

T.5S., R.3W., SECTION 18
N.T.S.

BENCHMARK
RIVERSIDE COUNTY B.M. M–26–2, BRASS DISC ON BRIDGE
ELEV = 1423.462, DATUM NGVD29.
AT THE SOUTHWEST CORNER OF THE BRIDGE SO 14–P OVER THE SAN JACINTO RIVER AT NUEVO ROAD; 14.0 FEET SOUTH OF NUEVO ROAD; A BRASS DISK SET IN THE TOP OF A CONCRETE BRIDGE ABUTMENT AND MARKED M–26–2 1963.

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 CITY APPROVAL OR DURING CONSTRUCTION, THE PRIVATE ENGINEER SHALL BE RESPONSIBLE FOR DETERMINING AN ACCEPTABLE SOLUTION AND REVISING THE PLANS FOR APPROVAL BY THE CITY.

DIGALERT
DIAL BEFORE YOU DIG TOLL FREE 1–800–227–2600 — TWO WORKING DAYS BEFORE YOU DIG
A PUBLIC SEVICE BY UNDERGROUND SERVICE ALERT

DATE	BY	MARK	REVISIONS	APPR.	DATE
9/30/08	RR	1	AS BUILT	ENGINEER	CITY

DESIGNED BY: RB DRAWN BY: BTE CHECKED BY: RB

SEAL

SEAL

APPROVED BY: DATE: 2-15-07
CITY ENGINEER
PREPARED UNDER THE SUPERVISION OF: DATE: 2-9-07
SCOTT R. HILDEBRANDT
R.C.E. NO. C44762 EXP. DATE 3-31-08

ALBERT A. WEBB ASSOCIATES ENGINEERING CONSULTANTS
CIVIL ENGINEERS
3788 McCRAY STREET
RIVERSIDE, CA. 92506
PH: (951) 686–1070
FAX: (951) 788–1256

SCALE: AS SHOWN
DATE: Feb 2007

CITY OF PERRIS
STORM DRAIN PLANS
CLASSIC PACIFIC BUSINESS PARK (PM 34062)
TITLE SHEET
INDEX MAP

FOR: CLASSIC PACIFIC W.O. 04–0425

SHEET 1 OF 3 SHEETS
CITY FILE NO: P8–921

16575 P-412

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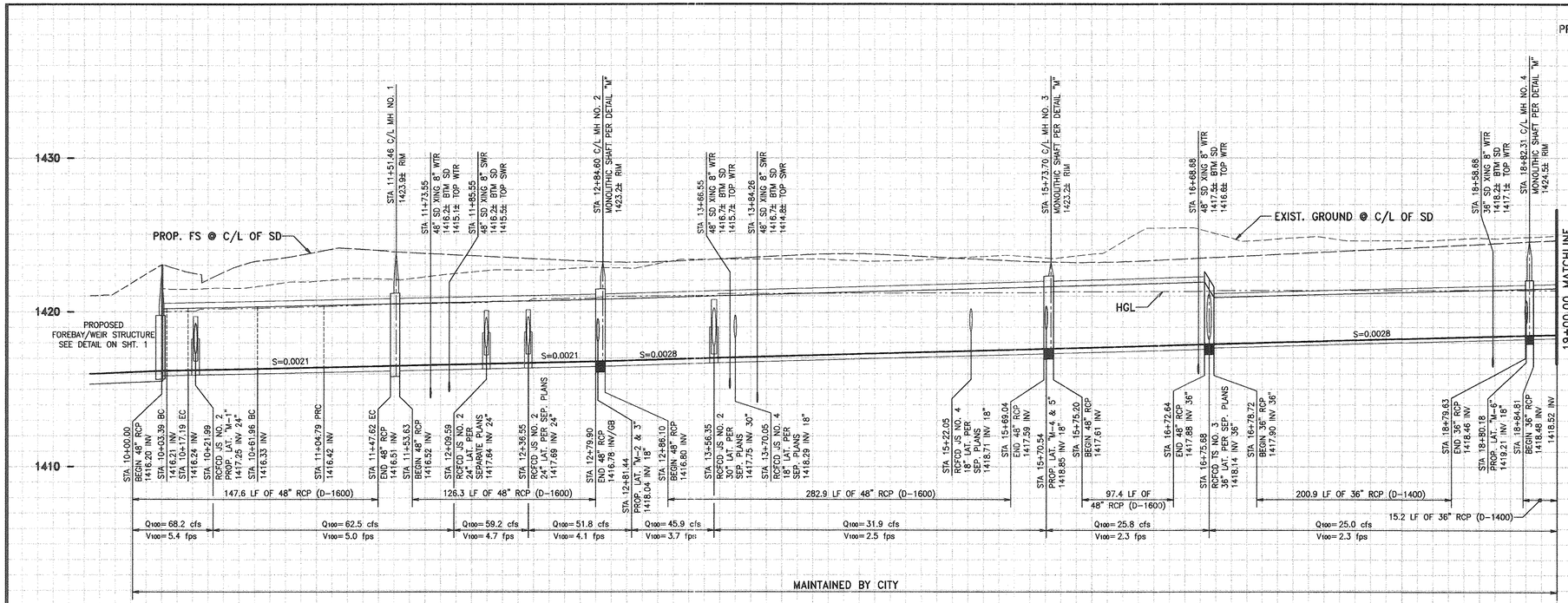
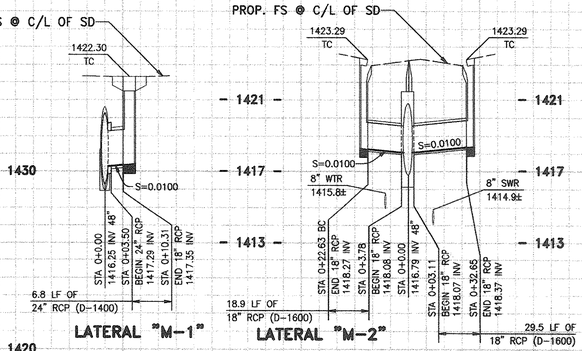




PROFILE SCALES
HORIZ. : 1" = 40'
VERT. : 1" = 4'

JS STA 10+21.99	
ANGLE A	90°00'00"
B	24"
C	3.50'
D	48"
E	1.44'
F	1.84'
G	1.59'
L	2.88"
ELEV. R	1417.39
ELEV. S	1417.27

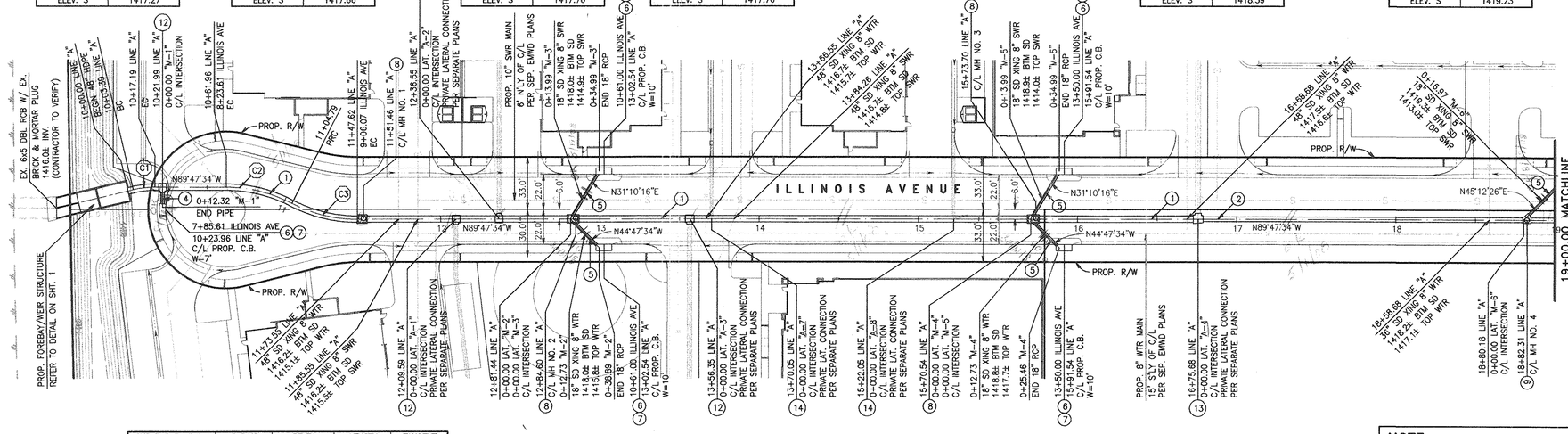
JS STA 12+09.59	
ANGLE A	90°00'00"
B	24"
C	3.50'
D	48"
E	1.44'
F	1.84'
G	1.59'
L	2.88"
ELEV. R	1417.68
ELEV. S	1417.66

JS STA 12+36.55	
ANGLE A	90°00'00"
B	24"
C	3.50'
D	48"
E	1.44'
F	1.85'
G	1.59'
L	2.88"
ELEV. R	1417.71
ELEV. S	1417.70

JS STA 13+56.35	
ANGLE A	90°00'00"
B	30"
C	3.50'
D	48"
E	2.25'
F	1.56'
G	1.35'
L	3.50'
ELEV. R	1417.77
ELEV. S	1417.76

TS STA 16+75.68	
ANGLE A	90°00'00"
B	36"
C	3.67'
D_1 & D_2	48" & 36"
L	6.08'
ELEV. R	1418.40
ELEV. S	1418.39

MH STA 18+80.18	
ANGLE A	45°00'00"
B	18"
C	5.01'
D_1 & D_2	36"
L	5.18'
ELEV. R	1419.26
ELEV. S	1419.23



CURVE DATA TABLE	RADIUS	DELTA	LENGTH	TANGENT
C1	60.00'	13°10'44"	13.80'	6.93'
C2	90.00'	27°15'58"	42.83'	21.83'
C3	90.00'	27°15'58"	42.83'	21.83'

LINE 'A'

CONSTRUCTION NOTES

1. INSTALL 48" RCP, D-LOAD PER PLAN
2. INSTALL 36" RCP, D-LOAD PER PLAN
3. INTENTIONALLY LEFT BLANK
4. INSTALL 24" RCP, D-LOAD PER PLAN
5. INSTALL 18" RCP, D-LOAD PER PLAN
6. CONSTRUCT CURB OPENING CATCH BASIN PER APWA STD. PLAN 300-2 (H=4" – W NOTED ON PLANS)
7. CONSTRUCT LOCAL DEPRESSION PER AWA STD. PLAN 313-1 CASE B
8. CONSTRUCT MANHOLE NO. 2 PER RCFCD STD. DWG. NO. MH252
9. CONSTRUCT MANHOLE NO. 4 PER RCFCD STD. DWG. NO. MH254
10. INTENTIONALLY LEFT BLANK
11. CONSTRUCT MANHOLE NO. 1 PER RCFCD STD. DWG. NO. MH251
12. CONSTRUCT JUNCTION STRUCTURE NO. 2 PER RCFCD STD. DWG. NO. JS227
13. CONSTRUCT TRANSITION STRUCTURE NO. 3 PER RCFCD STD. DWG. NO. TS303
14. CONSTRUCT JUNCTION STRUCTURE NO. 4 PER RCFCD STD. DWG. NO. JS229

NOTE
ALL ON-SITE STORM DRAIN AND PRIVATE LATERALS REFERRED TO ON THESE PLANS ARE TO BE CONSTRUCTED PER SEPARATE ON-SITE DRAINAGE PLANS AND CONCURRENTLY WITH PUBLIC STORM DRAIN SHOWN HEREON.

GRAPHIC SCALE 1"=40'
40 20 0 40 80 120

AS BUILT
THESE PLANS REFLECT ANY SUBSTANTIAL DESIGN MODIFICATIONS AS PROVIDED TO WEBB ASSOCIATES BY THE CONTRACTOR.
SCOTT R. HILDEBRANDT R.C.E. C44762
16-308 DATE
REGISTERED PROFESSIONAL ENGINEER SCOTT R. HILDEBRANDT NO. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA

BENCHMARK
RIVERSIDE COUNTY B.M. M-26-2, BRASS DISC ON BRIDGE
ELEV = 1423.462, DATUM NGVD29.
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DATE	BY	MARK	REVISIONS	APPR.	DATE
9-30-08	RR	1	AS BUILT		

ENGINEER CITY
DESIGNED BY: RB DRAWN BY: BTE CHECKED BY: RB

SEAL

SEAL
REGISTERED PROFESSIONAL ENGINEER SCOTT R. HILDEBRANDT NO. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA

APPROVED BY: DATE: 2-7-07
CITY ENGINEER
PREPARED UNDER THE SUPERVISION OF: DATE: 2-9-07
SCOTT R. HILDEBRANDT
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ALBERT A. WEBB ASSOCIATES
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3788 McCRAY STREET
RIVERSIDE, CA. 92506
PH: (951) 686-1070
FAX: (951) 788-1256

SCALE: AS SHOWN
DATE: Feb 2007

CITY OF PERRIS
STORM DRAIN PLANS
CLASSIC PACIFIC BUSINESS PARK (PM 34082)
PLAN AND PROFILE
STA. 10+00 TO STA. 19+00
FOR: CLASSIC PACIFIC
W.O. 04-0425

SHEET 2 OF 3 SHEETS
CITY FILE NO: P8-921

16575 P-412

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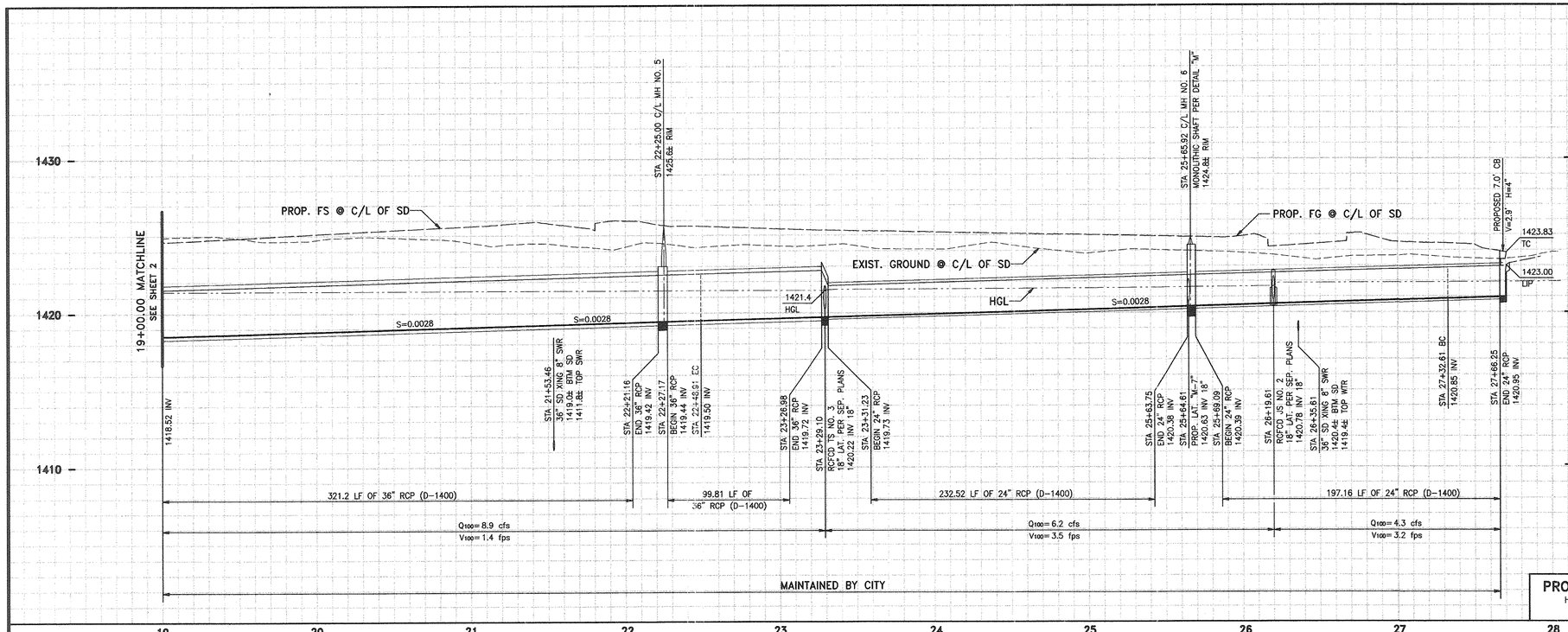

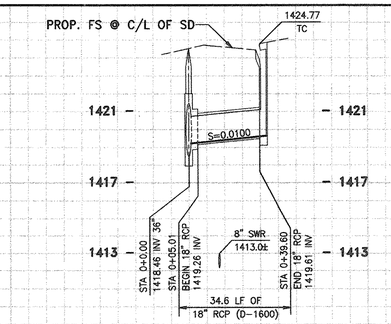

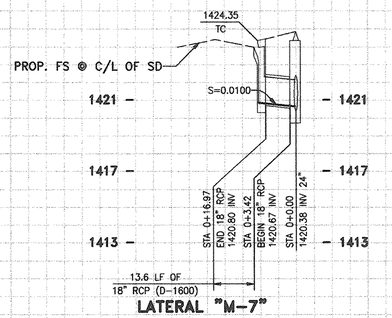

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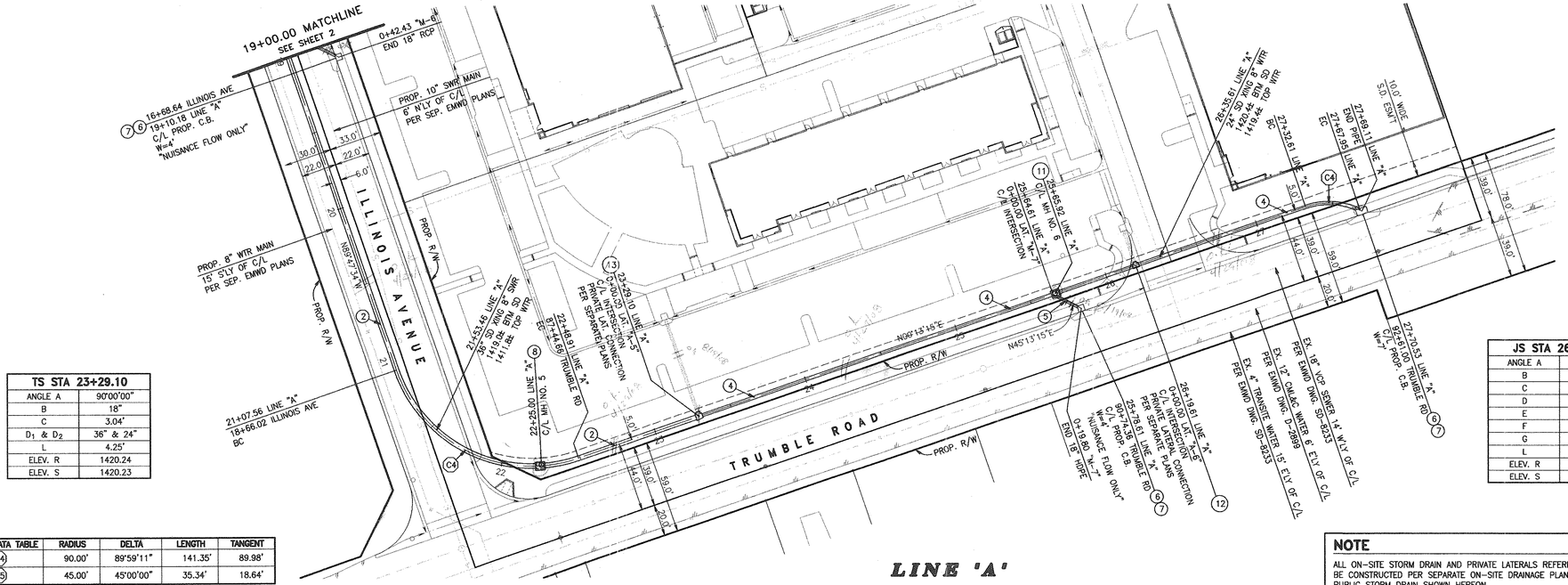

TS STA 23+29.10	
ANGLE A	90°00'00"
B	18"
C	3.04'
D_1 & D_2	36" & 24"
L	4.25'
ELEV. R	1420.24
ELEV. S	1420.23

JS STA 26+19.61	
ANGLE A	90°00'00"
B	18"
C	2.33'
D	24"
E	1.13'
F	0.75'
G	0.65'
L	2.25'
ELEV. R	1420.81
ELEV. S	1420.79

CURVE DATA TABLE	RADIUS	DELTA	LENGTH	TANGENT
C4	90.00'	89°59'11"	141.35'	89.98'
C5	45.00'	45°00'00"	35.34'	18.64'

CONSTRUCTION NOTES

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40 20 0 40 80 120

AS BUILT
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SCOTT R. WILDEBRANDT R.C.E. C44762 DATE 9-3-08
REGISTERED PROFESSIONAL ENGINEER SCOTT R. WILDEBRANDT NO. C44762 EXP. 3/31/10 CIVIL STATE OF CALIFORNIA

BENCHMARK
RIVERSIDE COUNTY B.M. M-26-2, BRASS DISC ON BRIDGE
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DATE	BY	MARK	REVISIONS	APPR.	DATE
9-30-08	RR	1	AS BUILT		

ENGINEER — CITY
DESIGNED BY: RB DRAWN BY: BTE CHECKED BY: RB

SEAL

SEAL — REGISTERED PROFESSIONAL ENGINEER SCOTT R. WILDEBRANDT NO. C44762 EXP. 3-31-08 CIVIL STATE OF CALIFORNIA

APPROVED BY: DATE: 2-7-07
CITY ENGINEER
PREPARED UNDER THE SUPERVISION OF: DATE: 2-5-07
SCOTT R. HILDEBRANDT
R.C.E. NO. C44762 EXP. DATE 3-31-08

ALBERT A. WEBB ASSOCIATES — ENGINEERING CONSULTANTS
CIVIL ENGINEERS
3788 McCRAY STREET
RIVERSIDE, CA. 92506
PH: (951) 686-1070
FAX: (951) 788-1256

SCALE: AS SHOWN
DATE: Feb 2007

CITY OF PERRIS
STORM DRAIN PLANS
CLASSIC PACIFIC BUSINESS PARK (PM 34062)
PLAN AND PROFILE
STA. 19+00 TO STA. 28+06
FOR: CLASSIC PACIFIC W.O. 04-0425

SHEET 3 OF 3 SHEETS
CITY FILE NO: P8-921

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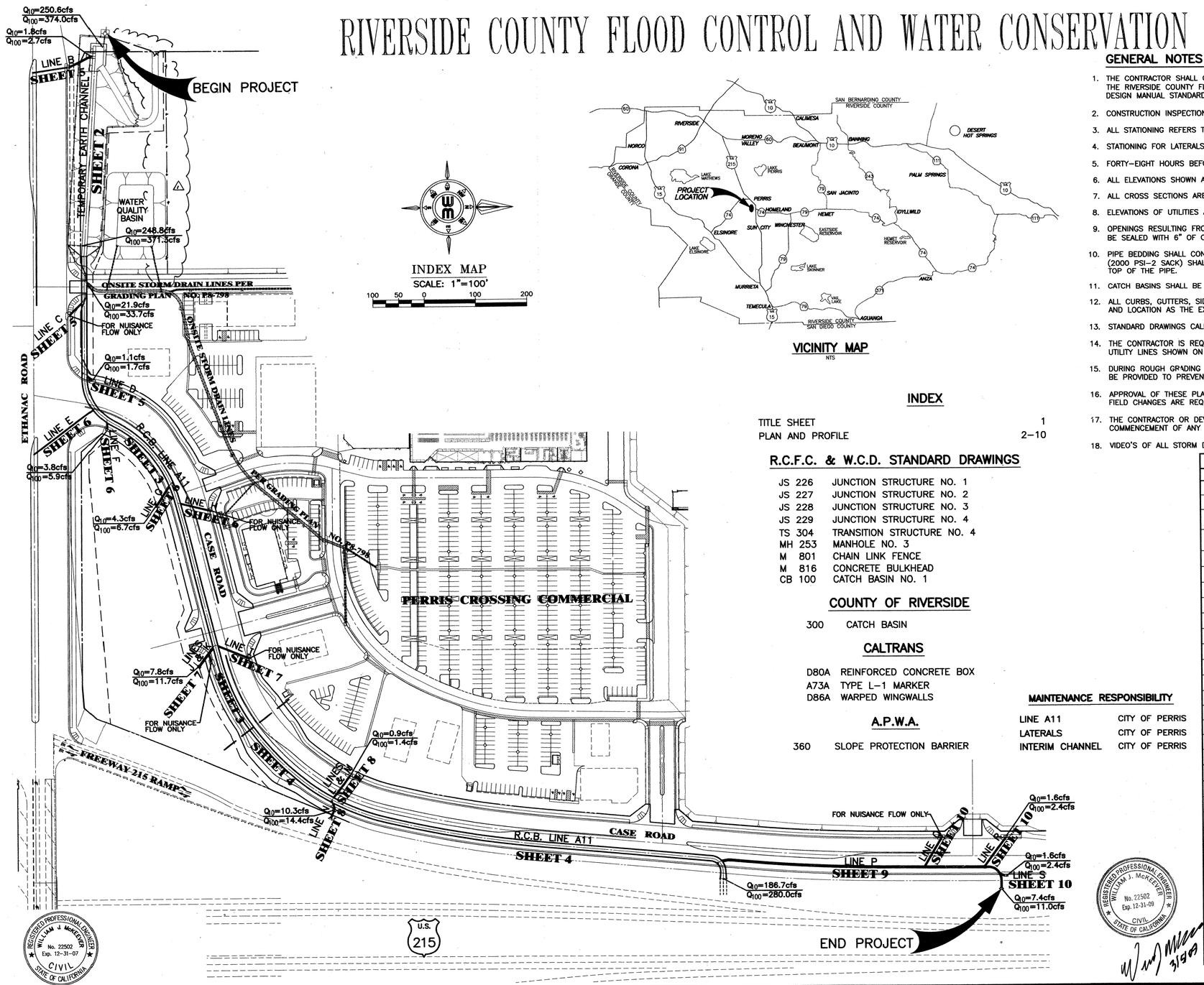
16575 P-412

MDP LINE A-11 STORM DRAIN PLAN P8-798

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT



INDEX MAP
SCALE: 1"=100'
100 50 0 100 200

VICINITY MAP
NTS

INDEX

TITLE SHEET	1
PLAN AND PROFILE	2–10

R.C.F.C. & W.C.D. STANDARD DRAWINGS

JS 226	JUNCTION STRUCTURE NO. 1
JS 227	JUNCTION STRUCTURE NO. 2
JS 228	JUNCTION STRUCTURE NO. 3
JS 229	JUNCTION STRUCTURE NO. 4
TS 304	TRANSITION STRUCTURE NO. 4
MH 253	MANHOLE NO. 3
M 801	CHAIN LINK FENCE
M 816	CONCRETE BULKHEAD
CB 100	CATCH BASIN NO. 1

COUNTY OF RIVERSIDE

300 CATCH BASIN

CALTRANS

D80A	REINFORCED CONCRETE BOX
A73A	TYPE L–1 MARKER
D86A	WARPED WINGWALLS

A.P.W.A.

360 SLOPE PROTECTION BARRIER

MAINTENANCE RESPONSIBILITY

LINE A11	CITY OF PERRIS
LATERALS	CITY OF PERRIS
INTERIM CHANNEL	CITY OF PERRIS

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 SEPTEMBER 1984, AND DESIGN MANUAL STANDARD DRAWINGS DATED APRIL 2004.
2. CONSTRUCTION INSPECTION WILL BE PERFORMED BY CITY OF PERRIS. THE CITY MUST BE NOTIFIED TWENTY DAYS (20) PRIOR TO CONSTRUCTION.
3. ALL STATIONING REFERS TO CENTERLINE OF CONSTRUCTION UNLESS OTHERWISE NOTED.
4. STATIONING FOR LATERALS AND CONNECTOR PIPE REFER TO THE CENTERLINE INTERSECTION STATIONS.
5. FORTY–EIGHT HOURS BEFORE EXCAVATION, CALL UNDERGROUND SERVICE ALERT 1–800–422–4133 AND/OR 1800–227–2600.
6. ALL ELEVATIONS SHOWN ARE IN FEET AND DECIMALS THEREOF BASED ON U.S.C. & G.S. DATUM.
7. ALL CROSS SECTIONS ARE TAKEN LOOKING DOWNSTREAM.
8. ELEVATIONS OF UTILITIES ARE APPROXIMATE UNLESS OTHERWISE NOTED.
9. OPENINGS RESULTING FROM THE CUTTING OR PARTIAL REMOVAL OF EXISTING CULVERTS, PIPES OR SIMILAR STRUCTURES TO BE ABANDONED SHALL BE SEALED WITH 6" OF CLASS "B" CONCRETE.
10. PIPE BEDDING SHALL CONFORM TO RCFC&WCD STD. DWG. NO. 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.
11. CATCH BASINS SHALL BE LOCATED SO THAT LOCAL DEPRESSION SHALL BEGIN AT EXISTING CURB RETURN JOINT, UNLESS OTHERWISE SPECIFIED.
12. 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.
13. STANDARD DRAWINGS CALLED FOR ON THE PLAN AND PROFILE SHALL CONFORM TO DISTRICT STANDARD DRAWINGS UNLESS NOTED OTHERWISE.
14. THE CONTRACTOR IS REQUIRED TO CALL ALL UTILITY AGENCIES REGARDING TEMPORARY SHORING AND SUPPORT REQUIREMENTS FOR THE VARIOUS UTILITY LINES SHOWN ON THESE PLANS.
15. 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.
16. APPROVAL OF THESE PLANS BY THE CITY DOES NOT RELIEVE THE DEVELOPER'S ENGINEER OF RESPONSIBILITY FOR THE ENGINEERING DESIGN. IF FIELD CHANGES ARE REQUIRED, IT WILL BE THE RESPONSIBILITY OF THE DESIGN ENGINEER TO MAKE THE NECESSARY CORRECTIONS.
17. THE CONTRACTOR OR DEVELOPER SHALL SECURE ALL REQUIRED ENCROACHMENT AND/OR STATE AND FEDERAL REGULATORY PERMITS PRIOR TO THE COMMENCEMENT OF ANY WORK.
18. VIDEO'S OF ALL STORM DRAINS SHALL BE SUBMITTED TO THE CITY ENGINEER.

CONSTRUCTION NOTES AND QUANTITIES

REFERENCE/S	CONSTRUCTION NOTE	QUANTITY
(1)	CONSTRUCT TEMPORARY TRAPEZOIDAL EARTHEN CHANNEL PER SECTION SHEET 2.	388 L.F.
(2)	CONSTRUCT PIPE THRU EARTHEN CHANNEL PER DETAILS SHEET 2.	1 EA.
(3)	CONSTRUCT WARPED WINGWALL PER CALTRANS STD. PLAN D86A. W=32.7' AND 29' L=30.8' AND 34.3'	1 EA.
(4)	CONSTRUCT REINFORCED CONCRETE BOX PER CALTRANS STD. PLAN D80A. 10' SPAN x 5' HEIGHT FLAT INVERT.	2,022 L.F.
(5)	INSTALL SLOPE PROTECTION BARRIER PER A.P.W.A. STD. PLAN 360.	1 EA.
(6)	PLACE 4" THICK CONCRETE SLAB.	1,567 S.F.
(7)	CONSTRUCT 3" A.C. OVER NATIVE.	3,542 S.F.
(8)(20)	CONSTRUCT JUNCTION STRUCTURE NO. 1 PER RCFCD STD. DWG. NO. JS226.	2 EA.
(30)(34)(36)	CONSTRUCT JUNCTION STRUCTURE NO. 2 PER RCFCD STD. DWG. NO. JS227	3 EA.
(9)(10)(11)(12)(13)(14)(15)(18)(19)(32)	CONSTRUCT JUNCTION STRUCTURE NO. 3 PER RCFCD STD. DWG. NO. JS228.	10 EA.
(16)	CONSTRUCT MANHOLE NO. 3 PER RCFCD STD. DWG. NO. MH253.	4 EA.
(17)	REMOVE EXISTING STORM DRAIN LINES AND HEADWALL.	385 L.F.
(21)	CONSTRUCT TRANSITION STRUCTURE NO. 4 PER RCFCD STD. DWG. NO. TS304.	1 EA.
(22)	CONSTRUCT CATCH BASIN PER COUNTY OF RIVERSIDE STD. NO. 300.	5 EA.
(23)	INSTALL 18" CLASS IV RCP. SLOPE PER PLAN.	382 L.F.
(24)	INSTALL 24" CLASS IV RCP. SLOPE PER PLAN.	635 L.F.
(25)	INSTALL 8" PVC DRAIN LINE AND RISER IN MEDIAN.	232 L.F.
(26)	INSTALL 8" NDS–10 ROUND GRATES PER NAT'L DIVERSIFIED SALES, INC. OR APPROVED EQUAL.	3 EA.
(27)	CONSTRUCT CONCRETE DROP INLET PER RCFCD STD. DWG. NO. CB110.	2 EA.
(28)	CONSTRUCT CONCRETE COLLAR PER RCFCD STD. DWG. NO. M803.	3 EA.
(29)	INSTALL 30" RCP 1500D. SLOPE PER PLAN.	45 L.F.
(33)	CONSTRUCT HEADWALL PER CALTRANS STD. PLAN D90A TYPE A.	2 EA.
(35)	CONSTRUCT MANHOLE NO. 1 PER RCFCD STD. DWG. NO. MH251	3 EA.
(38)	INSTALL MARKERS PER CALTRANS STD. PLAN A73A TYPE L–1 ALONG CHANNEL AT 100' O.C.	5 EA.
(39)	INSTALL 36" RCP 1500D. SLOPE PER PLAN.	510 L.F.
(40)	CONSTRUCT CHAIN LINK FENCE PER RCFCD STD. DWG. NO. M801.	145 L.F.
(41)	CONSTRUCT RCB CURVED SECTIONS PER RCFCD STD. DWG. NO. M819.	38 L.F.
(42)	INSTALL 4 L.F. 48" STUB AT S=0.0354.	4 L.F.
(43)	CONSTRUCT CONCRETE BULKHEAD PER RCFCD STD. DWG. NO. M816.	1 EA.
(44)	CONSTRUCT GROUTED 12" MIN. DIA. ROCK AROUND PUMP 2' THICK AND 2' DEPTH.	128 C.F.
(45)	CONSTRUCT CATCH BASIN NO. 1 PER COUNTY OF RCFCD STD. DWG. NO. CB100.	7 EA.

REGISTERED PROFESSIONAL ENGINEER WILLIAM J. McKEEVER No. 22502 Exp. 12-31-07 CIVIL STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER WILLIAM J. McKEEVER No. 22502 Exp. 12-31-09 CIVIL STATE OF CALIFORNIA

AS BUILT

W.J. McKEEVER, INC.
CIVIL ENGINEERING
647 NORTH MAIN STREET, SUITE 2A
RIVERSIDE, CALIFORNIA 92501
PH: (951) 341–3700
FAX: (951) 341–3740

WILLIAM J. McKEEVER, R.C.E. 22502 — DATE 12/11/06

CITY OF PERRIS
CITY FILE NO. P8–798
APPROVED BY:
CITY ENGINEER — DATE 12/11/06

DIG ALERT
CALL: TOLL FREE
1–800
227–2600
TWO WORKING DAYS BEFORE YOU DIG!

BENCHMARK:
RIVERSIDE COUNTY BENCHMARK BRASS DISK STAMPED "600–31–68" 700' N OF INT. MURRIETA RD & ETHANAC RD, 40' W OF MURRIETA ROAD 3' NE OF THE SE CORN. OF 8' CLF OF EMWD MURRIETA PUMP STA. 2' N OF A MARKER POST. ELEVATION = 1414.416 FT (5/85)

REVISIONS

REF.	DESCRIPTION	APPR.	DATE
1	AS-BUILT REV. INDEX MAP ADD FENCE & BASIN		

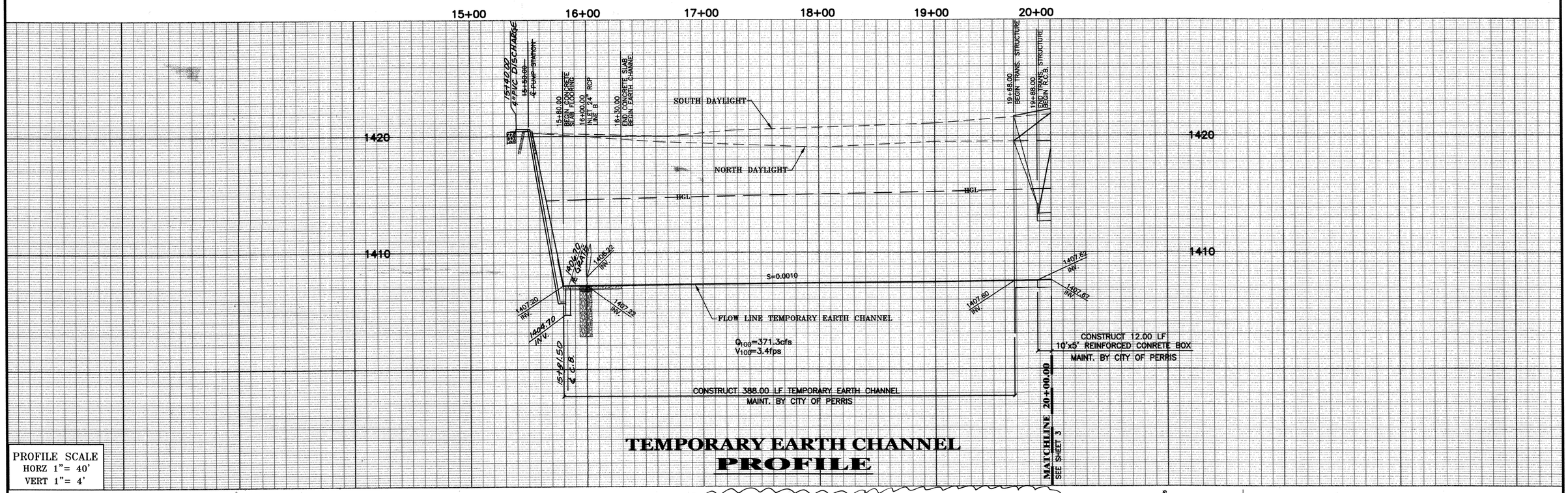
DESIGN BY: G. MELUSKI
DRAWN BY: J. NAPOLES
DATE DRAWN: JANUARY 2006
CHECKED BY: W.J. McKEEVER

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: — DATE:
APPROVED BY: — DATE:

PERRIS CROSSING
TEMPORARY EARTH CHANNEL, ROMOLAND MDP LINE A11 AND LATERALS
TITLE SHEET

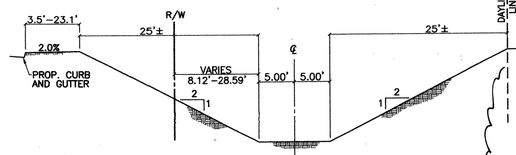
PROJECT NUMBER P8-798
DRAWING NO.
SHEET NO. 1 OF 10

P-397

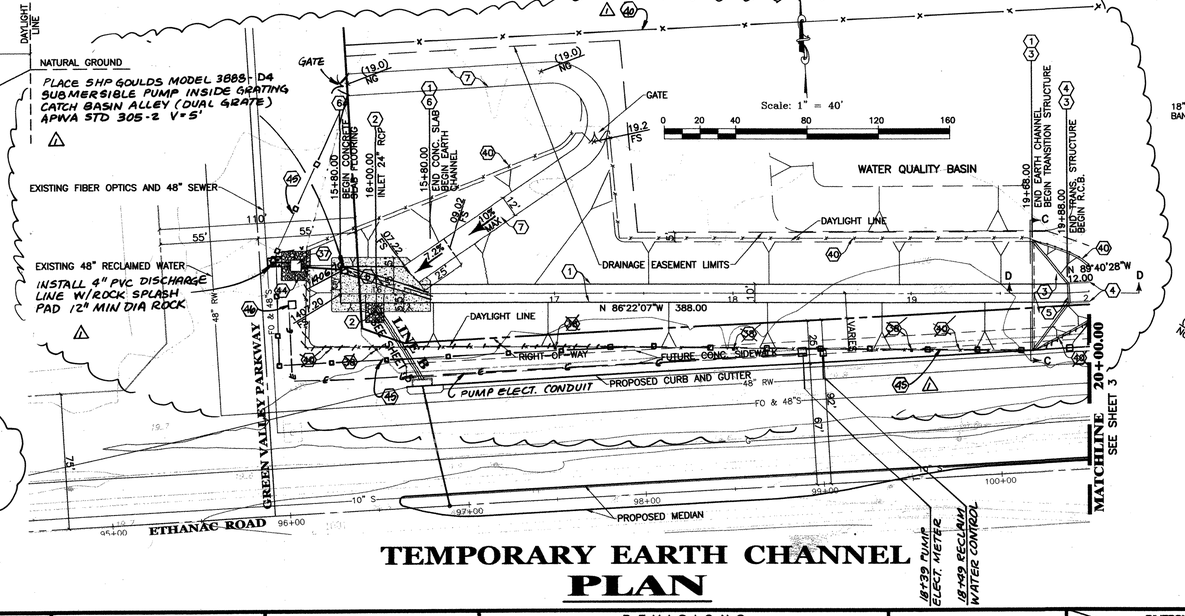


TEMPORARY EARTH CHANNEL
PROFILE

PROFILE SCALE
HORZ 1"= 40'
VERT 1"= 4'



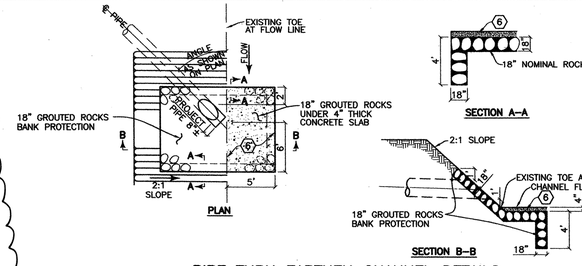
1 TRAPEZOIDAL EARTH CHANNEL DETAIL
SCALE: 1"=10'



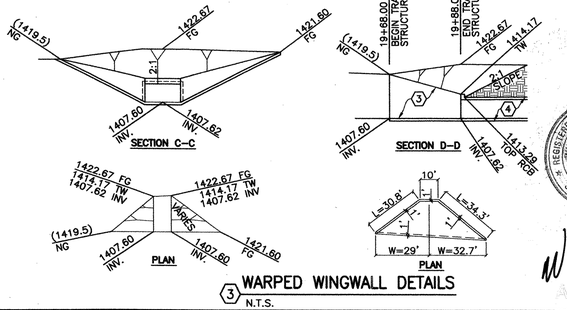
TEMPORARY EARTH CHANNEL
PLAN

CONSTRUCTION NOTES:

1. CONSTRUCT TEMPORARY TRAPEZOIDAL EARTHEN CHANNEL PER SECTION ABOVE.
2. CONSTRUCT PIPE THRU EARTHEN CHANNEL PER DETAILS RIGHT.
3. CONSTRUCT WARPED WINGWALL PER CALTRANS STD. PLAN D86A. W=32.7' AND 29' L=30.8' AND 34.3'
4. CONSTRUCT REINFORCED CONCRETE BOX PER CALTRANS STD. PLAN D80A. 10' SPAN x 5' HEIGHT FLAT INVERT.
5. INSTALL SLOPE PROTECTION BARRIER PER A.P.W.A. STD. PLAN 360.
6. PLACE 4" THICK CONCRETE SLAB.
7. CONSTRUCT 3" A.C. OVER NATIVE.
37. ~~FUTURE PUMP PAD 5'WIDE 3'THICK CONC. SPLASH PAD~~
38. ~~INSTALL MARKERS PER CALTRANS STD. PLAN A73A TYPE L-1 ALONG CHANNEL AT 100' O.C.~~
40. CONSTRUCT CHAIN LINK FENCE PER RCFCD STD. DWG. NO. M801.
44. CONSTRUCT GROUTED 12" MIN. DIA. ROCK AROUND ~~PUMP~~ SPLASH PAD 2' THICK AND 2' DEPTH.
45. 6' WROUGHT IRON FENCE
46. PUMP CONTROL PAD



2 PIPE THRU EARTHEN CHANNEL DETAILS
N.T.S.



3 WARPED WINGWALL DETAILS
N.T.S.

REGISTERED PROFESSIONAL ENGINEER WILLIAM J. McKEEVER No. 22502 Exp. 12-31-07 CIVIL STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER WILLIAM J. McKEEVER No. 22502 Exp. 12-31-09 CIVIL STATE OF CALIFORNIA

AS BUILT

W.J. McKEEVER, INC.
CIVIL ENGINEERING
647 NORTH MAIN STREET, SUITE 2A
RIVERSIDE, CALIFORNIA 92501
PH.: (951) 341-3700
FAX: (951) 341-3740
WILLIAM J. McKEEVER, R.C.E. 22502 DATE

CITY OF PERRIS
CITY FILE NO. P8-798
APPROVED BY:
CITY ENGINEER DATE

DIG ALERT
CALL: TOLL FREE
1-800
227-2600
TWO WORKING DAYS BEFORE YOU DIG!

BENCHMARK:
RIVERSIDE COUNTY BENCHMARK BRASS DISK STAMPED "600-31-68" 700' N OF INT. MURRIETA RD & ETHANAC RD, 40' W OF MURRIETA ROAD 3' NE OF THE SE CORN. OF 8' CLF OF EMWD MURRIETA PUMP STA. 2' N OF A MARKER POST. ELEVATION = 1414.416 FT (5/85)

REVISIONS

REF.	DESCRIPTION	APPR.	DATE
1	AS-BUILT REV FENCE LOCATION & TYPE ADD DISCHARGE LINE, ELECT LINE AND METERS ADD PUMP, BASIN AND SPLASH PAD NOTES		

DESIGN BY: G. MELUSKI
DRAWN BY: J. NAPOLES
DATE DRAWN: JANUARY 2006
CHECKED BY: W.J. McKEEVER

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE:
APPROVED BY: DATE:

PERRIS CROSSING
TEMPORARY
EARTH CHANNEL
PLAN AND PROFILE

PROJECT NUMBER P8-798
DRAWING NO.
SHEET NO. 2 OF 10

P-397

*CONTRACTOR TO VERIFY EXACT LOCATION AND DEPTH OF EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION AND NOTIFY DESIGN ENGINEER OF ANY DISCREPANCIES FOUND.

CONSTRUCT 1,000.00 LF 10'x5' REINFORCED CONRETE BOX
MAINT. BY CITY OF PERRIS

PROPOSED FINISH SURFACE OVER STORM DRAIN
EXISTING GROUND OVER STORM DRAIN

20+00 21+00 22+00 23+00 24+00 25+00 26+00 27+00 28+00 29+00 30+00

1430 1420 1410

SEE SHEET 2 MATCHLINE 20+00.00

20+42.56 INLET 48" RCP PER ONSITE SD PLAN NO. P8-798
20+44.56 ℄ 12" WATER
20+85.00 INLET 18" RCP LINE C
21+28.41 HORIZONTAL ANGLE POINT
21+34.28 ℄ 8" SEWER
22+17.00 ℄ MANHOLE NO. 1 RIM=1423.00
22+22.00 INLET 18" RCP LINE D
22+25.55 EC
22+47.41 ℄ 12" WATER
22+55.72 ℄ 3" GAS
22+89.49 INLET 8" PVC LINE F
23+25.85 INLET 18" RCP LINE F
23+37.30 BC
24+12.57 ℄ 12" WATER
25+00.00 ℄ MANHOLE NO. 2 RIM=1423.00
25+03.68 INLET 24" RCP LINE G
25+35.00 EC
25+45.00 INLET 18" RCP LINE H
27+93.09 ℄ 12" WATER
28+30.54 INLET 18" RCP LINE I
28+30.85 INLET 30" RCP LINE J
28+52.15 BC
MATCHLINE 30+00.00 SEE SHEET 4

INT. WS
HGL
1414.64 BOT
1415.31 TOP
1419.04 BOT
1419.70 TOP
1417.02 BOT
1417.68 TOP
1414.34 BOT
1415.00 TOP
1417.48 BOT
1418.14 TOP
1418.62 BOT
1419.28 TOP
1412.91 INV. ELEV. S (N)
1412.00 INV. ELEV. S (S)

1408.42 INV. ELEV. S
1410.01 INV. ELEV. S
1407.67 INV.
1407.83 INV.
1408.00 INV.
1407.52 BOT
1405.74 TOP
1408.37 INV.
1408.61 INV.
1410.56 INV. ELEV. S
1408.55 INV.
1408.54 INV.
1411.34 INV. ELEV. S
1411.00 INV. ELEV. S
1408.80 INV.
1408.98 INV.
1409.69 INV.
1409.62 INV.
1411.38 INV. ELEV. S
1412.00 INV. ELEV. S
1409.63 INV.
1409.78 INV.
1409.80 INV.
1410.91 INV.
1410.99 INV.
1412.57 INV.

S=0.0039

Q_{100}=371.3cfs V_{100}=7.4fps
Q_{100}=337.6cfs V_{100}=6.8fps
Q_{100}=335.9cfs V_{100}=6.7fps
Q_{100}=330.0cfs V_{100}=6.6fps
Q_{100}=323.3cfs V_{100}=6.5fps
Q_{100}=311.6cfs V_{100}=6.2fps

INVERT 10'x5' RCB

PROFILE SCALE
HORZ 1"= 40'
VERT 1"= 4'

ROMOLAND MDP LINE A11 PROFILE

CONSTRUCTION NOTES:

4. CONSTRUCT REINFORCED CONCRETE BOX PER CALTRANS STD. PLAN D80A. 10' SPAN x 5' HEIGHT FLAT INVERT.
8. CONSTRUCT JUNCTION STRUCTURE NO. 1 PER RCFCD STD. DWG. NO. JS226. A=44°29'32" B=48" C=11.55" ELEV. "K"=1408.56
9. CONSTRUCT JUNCTION STRUCTURE NO. 3 PER RCFCD STD. DWG. NO. JS228. A=45°00'00" D=18"
10. CONSTRUCT JUNCTION STRUCTURE NO. 3 PER RCFCD STD. DWG. NO. JS228. MODIFIED FOR 8" PVC. A=90°00'00" D=8"
11. CONSTRUCT JUNCTION STRUCTURE NO. 3 PER RCFCD STD. DWG. NO. JS228. A=52°33'30" D=18"
12. CONSTRUCT JUNCTION STRUCTURE NO. 3 PER RCFCD STD. DWG. NO. JS228. A=60°43'43" D=18"
13. CONSTRUCT JUNCTION STRUCTURE NO. 3 PER RCFCD STD. DWG. NO. JS228. A=53°45'04" D=18"
14. CONSTRUCT JUNCTION STRUCTURE NO. 3 PER RCFCD STD. DWG. NO. JS228. A=51°28'18" D=30"
15. CONSTRUCT JUNCTION STRUCTURE NO. 3 PER RCFCD STD. DWG. NO. JS228. A=54°23'26" B=24"
16. CONSTRUCT MANHOLE NO. 3 PER RCFCD STD. DWG. NO. MH253.
17. REMOVE EXISTING STORM DRAIN LINES AND HEADWALL.
42. INSTALL 4 L.F. 48" STUB AT S=0.0354.
43. CONSTRUCT CONCRETE BULKHEAD PER RCFCD STD. DWG. NO. M816.
44. CONSTRUCT 6' WROUGHT IRON FENCE

Scale: 1" = 40'
0 20 40 80 120 160

20+37.47 ℄ INTR.
FUTURE ONSITE S.D.
20+49.25 EXISTING WELL TO BE ABANDONED BY PERMIT FROM CONTRACTOR PER RIV. CO. HEALTH DEPT. STANDARDS
N 89°40'28"W
SEE SHEET 2 MATCHLINE 20+00.00
20+44.56 RCB X-ING 12" WATER
PROPOSED 12" WATER
20+72.00 ℄ INTR.
RIGHT-OF-WAY
DRAINAGE ESMT. LIMIT
21+28.11 HORIZ. ANGLE PT.
PROPOSED 8" SEWER
21+34.28 RCB X-ING 8" SEWER
N 89°42'19"W
SEE SHEET 5
97.44
LINE C
SEE SHEET 5
ETHANAC ROAD
22+47.41 RCB X-ING 12" WATER
22+55.72 RCB X-ING 3" GAS
22+89.49 ℄ INTR.
22+17.00 ℄ MH NO. 1
PROPOSED 12" WATER
EXISTING 3" GAS
EXISTING DBL. 24" SD
LINE E
SEE SHEET 5
23+20.26 ℄ INTR.
110+00.00 CASE ROAD= 103+13.57 ETHANAC ROAD
25+00.00 ℄ MH NO. 2
RIGHT-OF-WAY
PROP. 12" WATER
EXISTING 3" GAS
12"W
LINE H
SEE SHEET 6
CASE ROAD
PROPOSED CURB AND GUTTER
PROPOSED MEDIAN
284.67
N 75°43'43"E
LINE G
SEE SHEET 6
PROP. 12" WATER
25+35.00 EC
25+42.20 ℄ INTR.
REFER TO GRADING PLAN SHEET 9 CITY FILE NO. P8-798
27+93.09 RCB X-ING 12" WATER
28+26.87 ℄ INTR.
18"RCP
LINE I
SEE SHEET 6
25.28
LINES J & K
SEE SHEET 7
28+52.15 BC
MATCHLINE 30+00.00 SEE SHEET 4

CURVE DATA				
	DELTA	RADIUS	LENGTH	TANGENT
A	36°38'01"	100.00	63.94	33.10
B	17°37'45"	100.00	30.77	15.51
C	09°46'05"	100.00	17.05	8.54
D	40°42'23"	229.00	162.70	84.95
E	08°45'29"	229.00	35.00	17.54
F	19°12'33"	441.00	147.85	74.63

ROMOLAND MDP LINE A11 PLAN

REGISTERED PROFESSIONAL ENGINEER WILLIAM J. McKEEVER No. 22502 Exp. 12-31-07 CIVIL STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER WILLIAM J. McKEEVER No. 22502 Exp. 12-31-09 CIVIL STATE OF CALIFORNIA

AS-BUILT

W.J. McKEEVER, INC.
CIVIL ENGINEERING
647 NORTH MAIN STREET, SUITE 2A
RIVERSIDE, CALIFORNIA 92501
PH.: (951) 341-3700
FAX: (951) 341-3740
WILLIAM J. McKEEVER, R.C.E. 22502 DATE 12/14/06

CITY OF PERRIS
CITY FILE NO. P8-798
APPROVED BY:
CITY ENGINEER DATE 12-22-06

DIG ALERT
CALL: TOLL FREE
1-800
227-2600
TWO WORKING DAYS BEFORE YOU DIG!

BENCHMARK:
RIVERSIDE COUNTY BENCHMARK BRASS DISK STAMPED "600-31-68" 700' N OF INT. MURRIETA RD & ETHANAC RD, 40' W OF MURRIETA ROAD 3' NE OF THE SE CORN. OF 8' CLF OF EMWD MURRIETA PUMP STA. 2' N OF A MARKER POST. ELEVATION = 1414.416 FT (5/85)

REVISIONS

REF.	DESCRIPTION	APPR.	DATE
△	AS BUILT ADD W.I FENCE 18"R.C.P.		

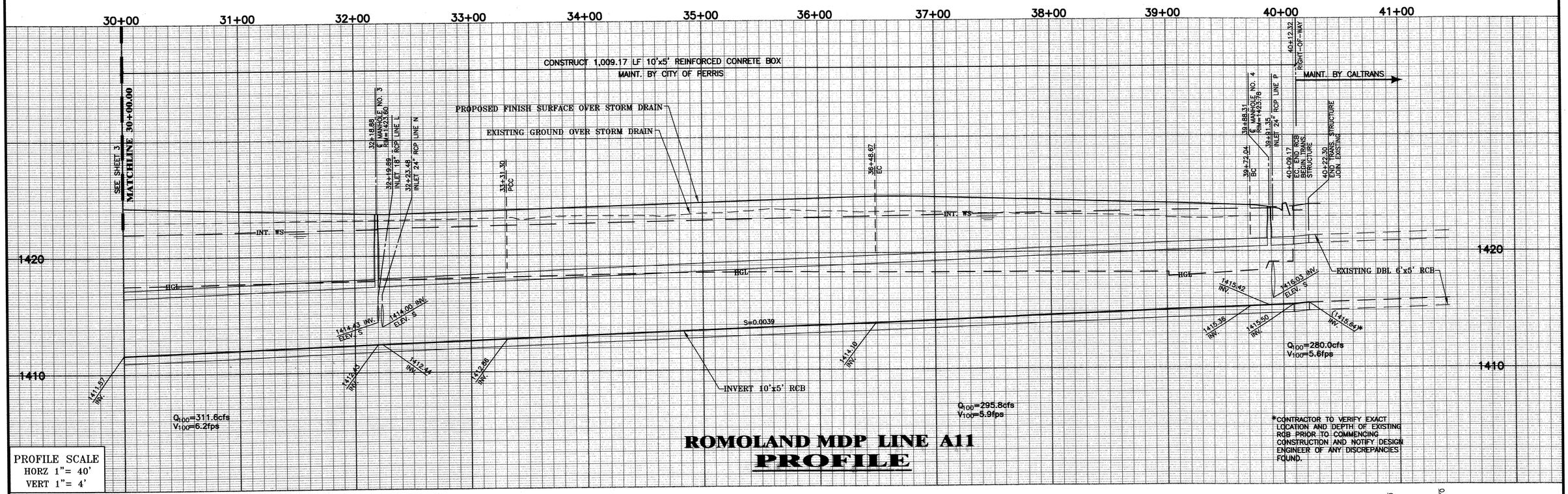
DESIGN BY: G. MELUSKI
DRAWN BY: J. NAPOLES
DATE DRAWN: JANUARY 2006
CHECKED BY: W.J. McKEEVER

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL: DATE:
APPROVED BY: DATE:

PERRIS CROSSING
ROMOLAND MDP
LINE A11
PLAN AND PROFILE

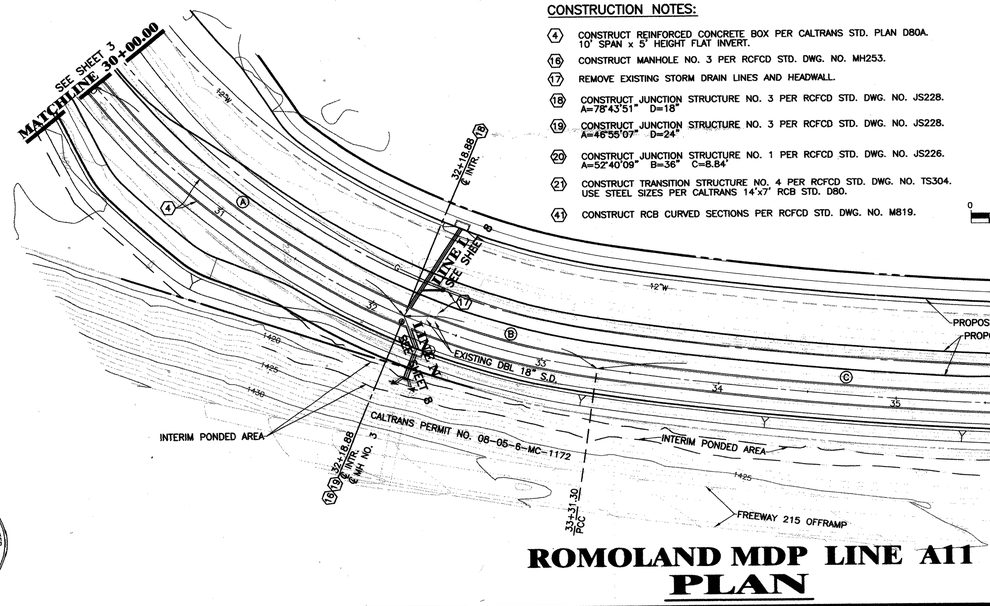
PROJECT NUMBER P8-798
DRAWING NO.
SHEET NO. 3 OF 10

P-397



PROFILE SCALE
HORZ 1"= 40'
VERT 1"= 4'

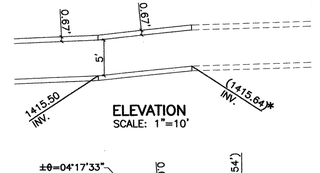
ROMOLAND MDP LINE A11
PROFILE

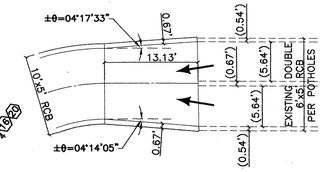


CONSTRUCTION NOTES:

4. CONSTRUCT REINFORCED CONCRETE BOX PER CALTRANS STD. PLAN D80A. 10' SPAN x 5' HEIGHT FLAT INVERT.
16. CONSTRUCT MANHOLE NO. 3 PER RCFCD STD. DWG. NO. MH253.
17. REMOVE EXISTING STORM DRAIN LINES AND HEADWALL.
18. CONSTRUCT JUNCTION STRUCTURE NO. 3 PER RCFCD STD. DWG. NO. JS228. A=78°43'51" D=18"
19. CONSTRUCT JUNCTION STRUCTURE NO. 3 PER RCFCD STD. DWG. NO. JS228. A=46°55'07" D=24"
20. CONSTRUCT JUNCTION STRUCTURE NO. 1 PER RCFCD STD. DWG. NO. JS226. A=52°40'09" B=36" C=8.84'
21. CONSTRUCT TRANSITION STRUCTURE NO. 4 PER RCFCD STD. DWG. NO. TS304. USE STEEL SIZES PER CALTRANS 14'x7' RCB STD. D80.
41. CONSTRUCT RCB CURVED SECTIONS PER RCFCD STD. DWG. NO. M819.

CURVE / LINE DATA				
○	DELTA	RADIUS	LENGTH	TANGENT
(A)	28°26'17"	441.00	218.89	111.75
(B)	14°36'20"	441.00	112.42	56.52
(C)	08°22'33"	2171.00	317.37	158.97
(D)	37°16'47"	25.00	16.27	8.43
(E)	47°49'09"	25.00	20.86	11.08
(F)	N 89°48'04"W	–	13.13	–





NOTE: USE STEEL SIZES PER CALTRANS 14'x7' RCB STD. D80.

21 TRANSITION STRUCTURE DETAILS
SCALE: 1"=10'

REGISTERED PROFESSIONAL ENGINEER
WILLIAM J. McKEEVER
No. 22502
Exp. 12-31-09
CIVIL
STATE OF CALIFORNIA

AS BUILT

REGISTERED PROFESSIONAL ENGINEER
WILLIAM J. McKEEVER
No. 22502
Exp. 12-31-07
CIVIL
STATE OF CALIFORNIA

ROMOLAND MDP LINE A11
PLAN

W.J. McKEEVER, INC.
CIVIL ENGINEERING
647 NORTH MAIN STREET, SUITE 2A
RIVERSIDE, CALIFORNIA 92501
PH.: (951) 341-3700
FAX: (951) 341-3740
WILLIAM J. McKEEVER, R.C.E. 22502 — DATE 11/18/06

CITY OF PERRIS
CITY FILE NO. P8-798
APPROVED BY: _____ 12-20-06
CITY ENGINEER — DATE

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TWO WORKING DAYS BEFORE YOU DIG!

BENCHMARK:
RIVERSIDE COUNTY BENCHMARK BRASS DISK STAMPED "600-31-68" 700' N OF INT. MURRIETA RD & ETHANAC RD, 40' W OF MURRIETA ROAD 3' NE OF THE SE CORN. OF 8' CLF OF EMWD MURRIETA PUMP STA. 2' N OF A MARKER POST. ELEVATION = 1414.416 FT (5/85)

REVISIONS			
REF.	DESCRIPTION	APPR.	DATE
1	AS BUILT NO REVISIONS		

DESIGN BY: G. MELUSKI
DRAWN BY: J. NAPOLES
DATE DRAWN: JANUARY 2006
CHECKED BY: W.J. McKEEVER

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: _____ DATE: _____
APPROVED BY: _____ DATE: _____

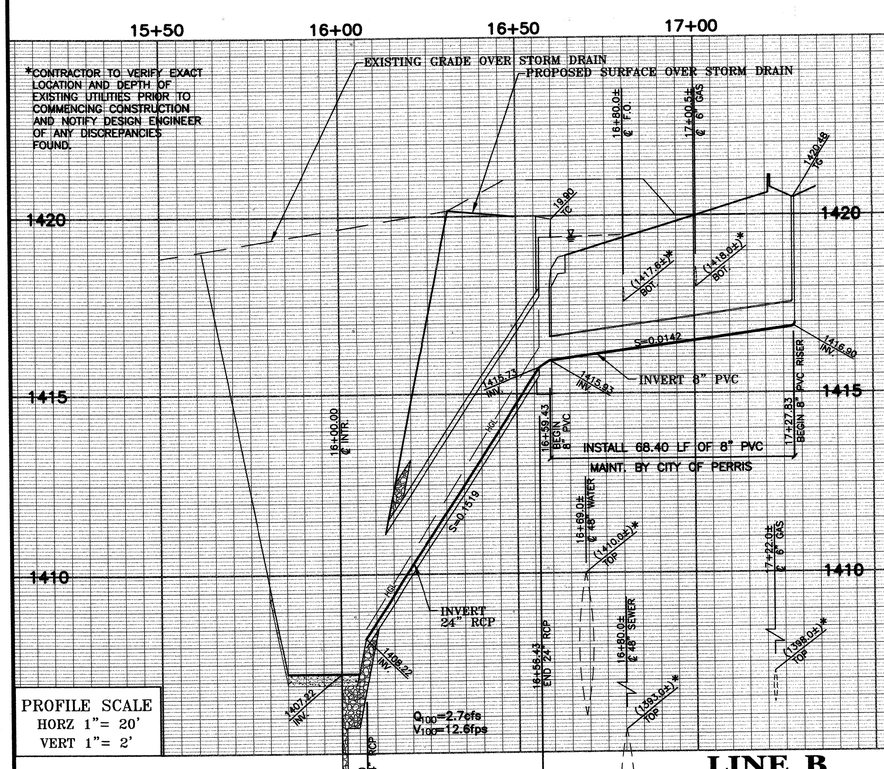
PERRIS CROSSING
ROMOLAND MDP
LINE A11
PLAN AND PROFILE

PROJECT NUMBER P8-798
DRAWING NO.
SHEET NO. 4 OF 10

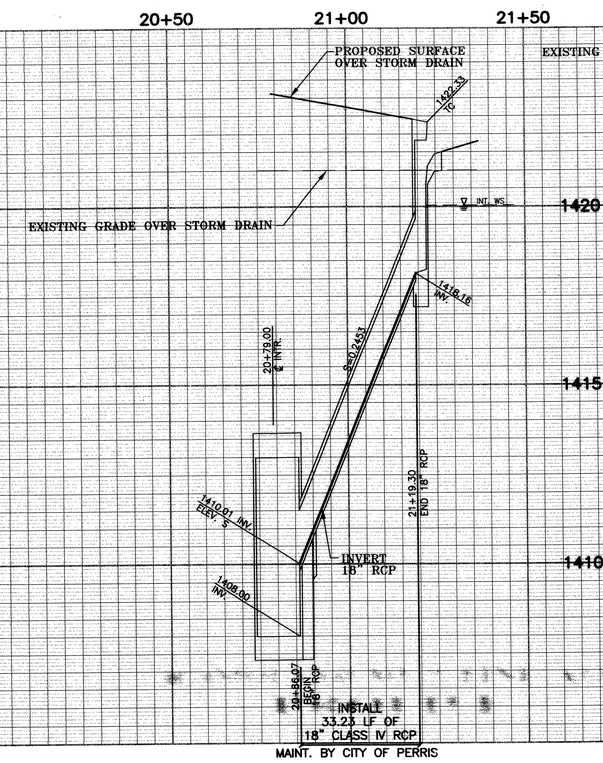
P-397

*CONTRACTOR TO VERIFY EXACT LOCATION AND DEPTH OF EXISTING UTILITIES PRIOR TO COMMENCING CONSTRUCTION AND NOTIFY DESIGN ENGINEER OF ANY DISCREPANCIES FOUND.

PROFILE SCALE
HORZ 1"= 20'
VERT 1"= 2'

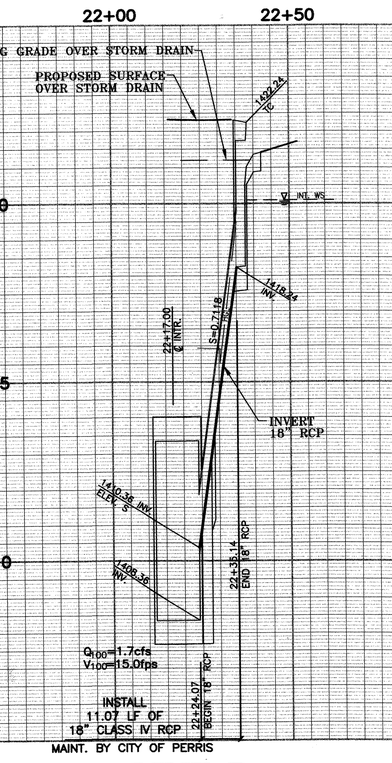


LINE B PROFILE

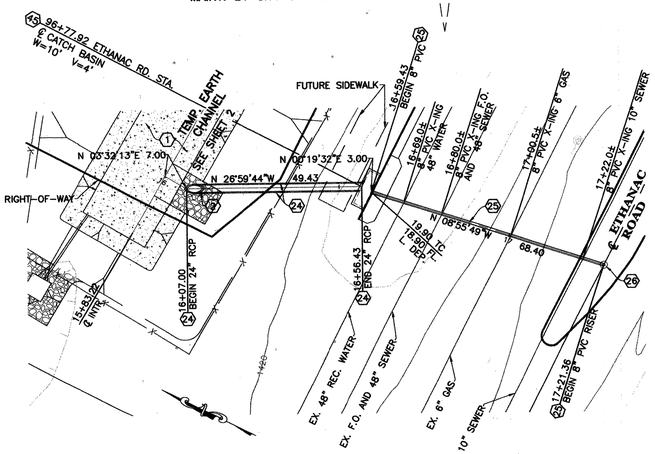


LINE C PROFILE

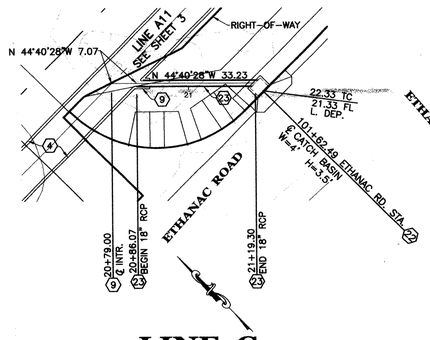
*CB FOR NUISANCE FLOWS ONLY



LINE D PROFILE



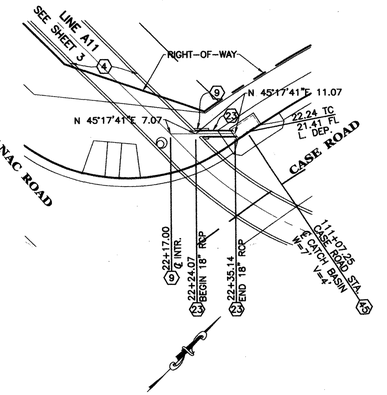
LINE B PLAN



LINE C PLAN

Scale: 1" = 20'

0 10 20 40 60 80



LINE D PLAN

CONSTRUCTION NOTES:

1. CONSTRUCT TEMPORARY TRAPEZOIDAL EARTHEN CHANNEL PER SECTION SHEET 2.
2. CONSTRUCT PIPE THRU EARTHEN CHANNEL PER DETAILS SHEET 2.
4. CONSTRUCT REINFORCED CONCRETE BOX PER CALTRANS STD. PLAN D80A. 10' SPAN x 5' HEIGHT FLAT INVERT.
9. CONSTRUCT JUNCTION STRUCTURE NO. 3 PER RCFCD STD. DWG. NO. JS228. A=45°00'00" D=18"
22. CONSTRUCT CATCH BASIN PER COUNTY OF RIVERSIDE STD. NO. 300.
23. INSTALL 18" CLASS IV RCP. SLOPE PER PLAN.
24. INSTALL 24" CLASS IV RCP. SLOPE PER PLAN.
25. INSTALL 8" PVC DRAIN LINE AND RISER IN MEDIAN.
26. INSTALL 8" NDS-10 ROUND GRATES PER NATIONAL DIVERSIFIED SALES, INC. OR APPROVED EQUAL.
45. CONSTRUCT CATCH BASIN NO. 1 PER RCFCD STD. DWG. NO. CB100.

REGISTERED PROFESSIONAL ENGINEER
WILLIAM J. McKEEVER
No. 22502
Exp. 12-31-09
CIVIL
STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
WILLIAM J. McKEEVER
No. 22502
Exp. 12-31-07
CIVIL
STATE OF CALIFORNIA

AS BUILT

W.J. McKEEVER, INC.
CIVIL ENGINEERING
647 NORTH MAIN STREET, SUITE 2A
RIVERSIDE, CALIFORNIA 92501
PH.: (951) 341-3700
FAX: (951) 341-3740

WILLIAM J. McKEEVER, R.C.E. 22502 — DATE

CITY OF PERRIS
CITY FILE NO. P8-798
APPROVED BY:
CITY ENGINEER — DATE

DIG ALERT
CALL: TOLL FREE
1-800
227-2600
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BENCHMARK:
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REVISIONS			
REF.	DESCRIPTION	APPR.	DATE
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DESIGN BY: G. MELUSKI
DRAWN BY: J. NAPOLES
DATE DRAWN: JANUARY 2006
CHECKED BY: W.J. McKEEVER

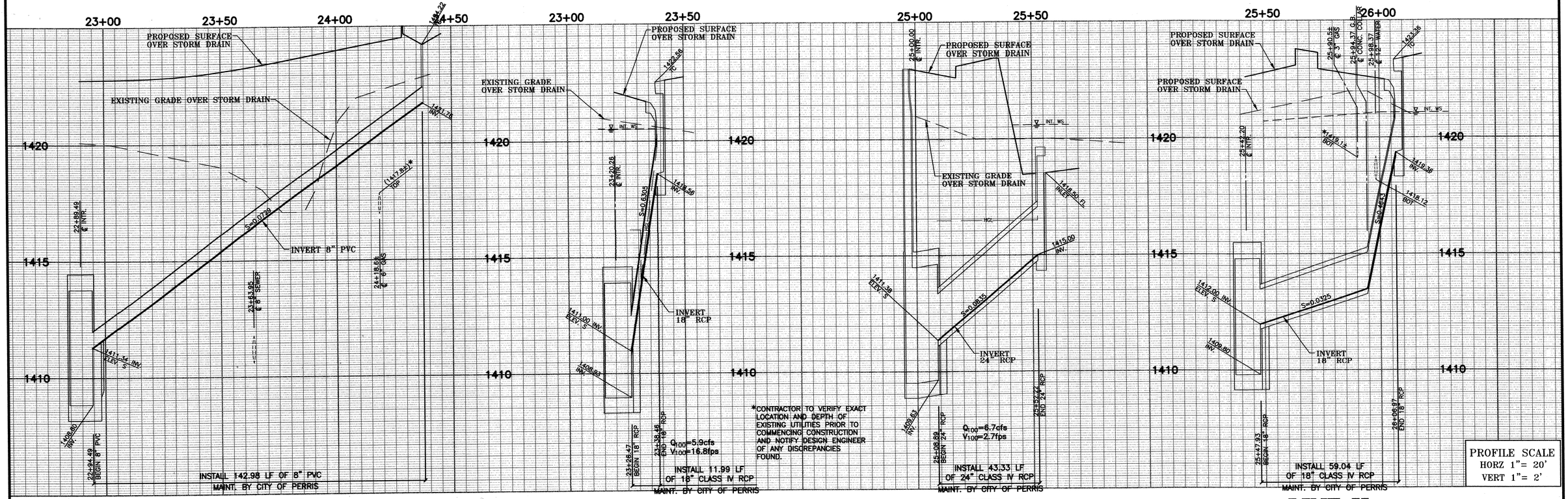
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL: — DATE:
APPROVED BY: — DATE:

PERRIS CROSSING R.C.P. LINES B, C, AND D

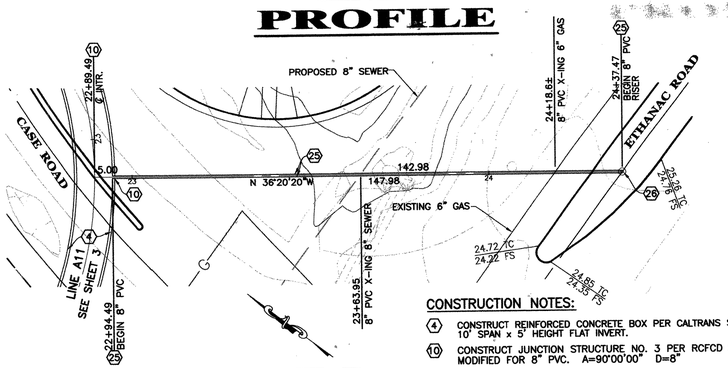
PLAN AND PROFILE

PROJECT NUMBER P8-798
DRAWING NO.
SHEET NO. 5 OF 10

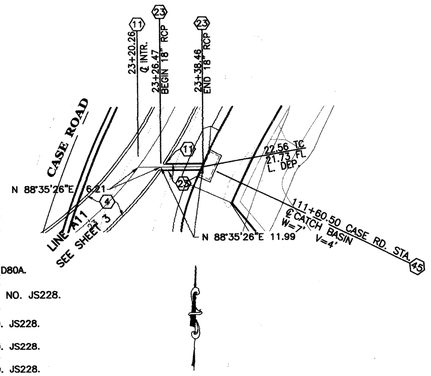
P-397



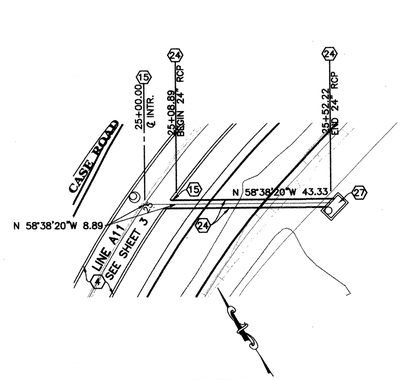
LINE E PROFILE



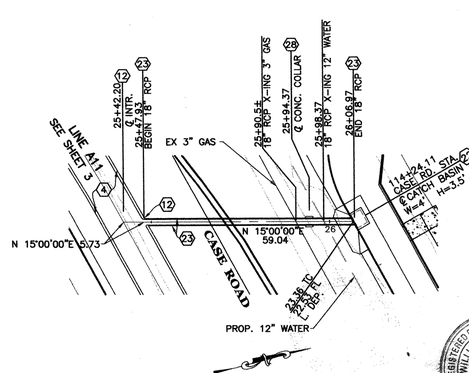
LINE E PLAN



LINE F PLAN



LINE G PLAN



LINE H PLAN

*CB FOR NUISANCE FLOWS ONLY

CONSTRUCTION NOTES:

4. CONSTRUCT REINFORCED CONCRETE BOX PER CALTRANS STD. PLAN D80A. 10' SPAN x 5' HEIGHT FLAT INVERT.
10. CONSTRUCT JUNCTION STRUCTURE NO. 3 PER RCFCD STD. DWG. NO. JS228. MODIFIED FOR 8" PVC. A=90°00'00" D=8"
11. CONSTRUCT JUNCTION STRUCTURE NO. 3 PER RCFCD STD. DWG. NO. JS228. A=52°33'30" D=18"
12. CONSTRUCT JUNCTION STRUCTURE NO. 3 PER RCFCD STD. DWG. NO. JS228. A=60°43'43" D=18"
15. CONSTRUCT JUNCTION STRUCTURE NO. 3 PER RCFCD STD. DWG. NO. JS228. A=54°23'26" D=24"
22. CONSTRUCT CATCH BASIN PER COUNTY OF RIVERSIDE STD. NO. 300.
23. INSTALL 18" CLASS IV RCP. SLOPE PER PLAN.
24. INSTALL 24" CLASS IV RCP. SLOPE PER PLAN.
25. INSTALL 8" PVC DRAIN LINE AND RISER IN MEDIAN.
26. INSTALL 8" NDS-10 ROUND GRATES PER NATIONAL DIVERSIFIED SALES, INC. OR APPROVED EQUAL.
27. CONSTRUCT CONCRETE DROP INLET (W=6' V=4.62') PER RCFCD STD. DWG. NO. CB110.
28. CONSTRUCT CONCRETE COLLAR PER RCFCD STD. DWG. NO. M803.
45. CONSTRUCT CATCH BASIN NO. 1 PER RCFCD STD. DWG. NO. CB100.

Scale: 1" = 20'
0 10 20 40 60 80

REGISTERED PROFESSIONAL ENGINEER WILLIAM J. McKEEVER No. 22502 Exp. 12-31-07 CIVIL STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER WILLIAM J. McKEEVER No. 22502 Exp. 12-31-09 CIVIL STATE OF CALIFORNIA

AS BUILT

W.J. McKEEVER, INC.
CIVIL ENGINEERING
647 NORTH MAIN STREET, SUITE 2A
RIVERSIDE, CALIFORNIA 92501
PH.: (951) 341-3700
FAX: (951) 341-3740
WILLIAM J. McKEEVER, R.C.E. 22502 — DATE

CITY OF PERRIS
CITY FILE NO. P8-798
APPROVED BY: CITY ENGINEER — DATE 12-26-06

DIG ALERT
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1-800
227-2600
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RIVERSIDE COUNTY BENCHMARK BRASS DISK STAMPED "600-31-68" 700' N OF INT. MURRIETA RD & ETHANAC RD, 40' W OF MURRIETA ROAD 3' NE OF THE SE CORN. OF 8' CLF OF EMWD MURRIETA PUMP STA. 2' N OF A MARKER POST. ELEVATION = 1414.416 FT (5/85)

REVISIONS

REF.	DESCRIPTION	APPR.	DATE
1	AS-BUILT NO REVISIONS		

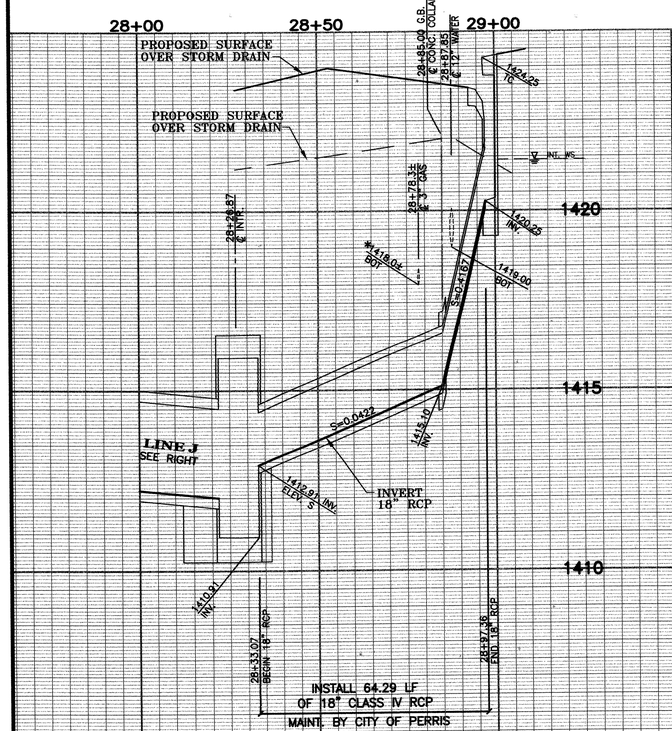
DESIGN BY: G. MELUSKI
DRAWN BY: J. NAPOLES
DATE DRAWN: JANUARY 2006
CHECKED BY: W.J. McKEEVER

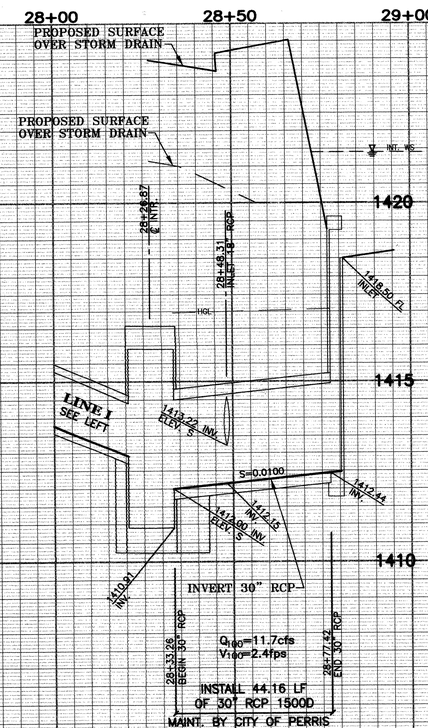
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE:
APPROVED BY: DATE:

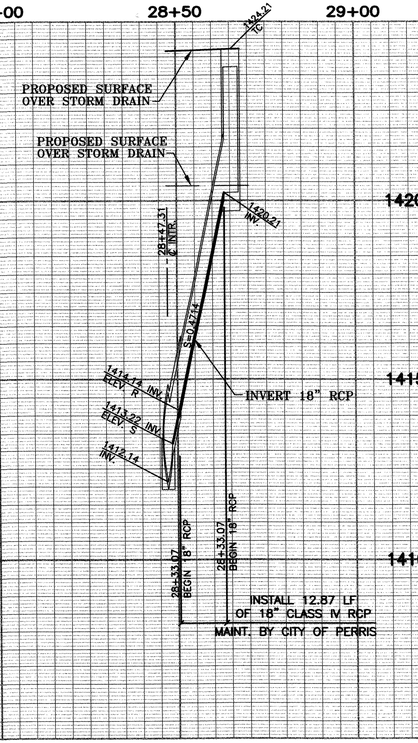
PERRIS CROSSING
R.C.P.
LINES E, F, G AND H
PLAN AND PROFILE

PROJECT NUMBER P8-798
DRAWING NO.
SHEET NO. 6 OF 10

P-397



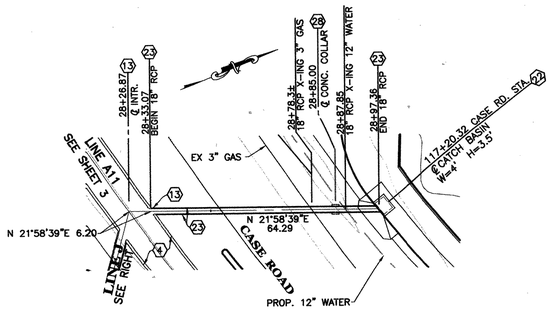




PROFILE SCALE
HORZ 1"= 20'
VERT 1"= 2'

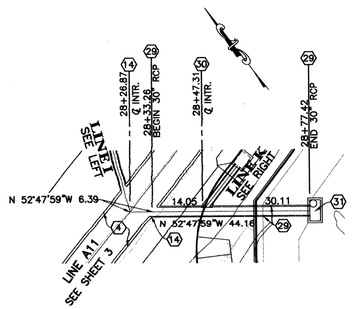
LINE I PROFILE

*CB FOR NUISANCE FLOWS ONLY



LINE I PLAN

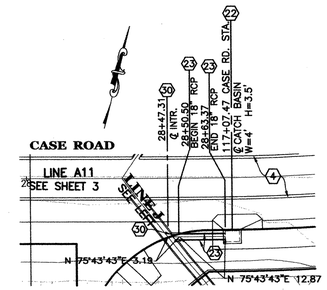
LINE J PROFILE



LINE J PLAN

LINE K PROFILE

*CB FOR NUISANCE FLOWS ONLY



LINE K PLAN

CONSTRUCTION NOTES:

4. CONSTRUCT REINFORCED CONCRETE BOX PER CALTRANS STD. PLAN D80A. 10' SPAN x 5' HEIGHT FLAT INVERT.
13. CONSTRUCT JUNCTION STRUCTURE NO. 3 PER RCFCD STD. DWG. NO. JS228. A=53°45'04" D=18"
14. CONSTRUCT JUNCTION STRUCTURE NO. 3 PER RCFCD STD. DWG. NO. JS228. A=51°28'18" D=30"
22. CONSTRUCT CATCH BASIN PER COUNTY OF RIVERSIDE STD. NO. 300.
23. INSTALL 18" CLASS IV RCP. SLOPE PER PLAN.
28. CONSTRUCT CONCRETE COLLAR PER RCFCD STD. DWG. NO. M803.
29. INSTALL 30" RCP 1500D. SLOPE PER PLAN.
30. CONSTRUCT JUNCTION STRUCTURE NO. 2 PER RCFCD STD. DWG. NO. JS227 A=51°28'18" B=18" C=3.61' D=30" E=2.66' F=0.68' G=1.22' L=2.86'
31. CONSTRUCT CONCRETE DROP INLET (W=6' V=7.18') PER RCFCD STD. DWG NO. CB110.

REGISTERED PROFESSIONAL ENGINEER WILLIAM J. McKEEVER No. 22502 Exp. 12-31-09 CIVIL STATE OF CALIFORNIA

AS BUILT

Scale: 1" = 20'
0 10 20 40 60 80

REGISTERED PROFESSIONAL ENGINEER WILLIAM J. McKEEVER No. 22502 Exp. 12-31-07 CIVIL STATE OF CALIFORNIA

W.J. McKEEVER, INC.
CIVIL ENGINEERING
647 NORTH MAIN STREET, SUITE 2A
RIVERSIDE, CALIFORNIA 92501
PH.: (951) 341-3700
FAX: (951) 341-3740

WILLIAM J. McKEEVER, R.C.E. 22502 — DATE 12/18/06

CITY OF PERRIS
CITY FILE NO. P8-798
APPROVED BY:
CITY ENGINEER — DATE

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RIVERSIDE COUNTY BENCHMARK BRASS DISK STAMPED "600-31-68" 700' N OF INT. MURRIETA RD & ETHANAC RD, 40' W OF MURRIETA ROAD 3' NE OF THE SE CORN. OF 8' CLF OF EMWD MURRIETA PUMP STA. 2' N OF A MARKER POST. ELEVATION = 1414.416 FT (5/85)

REVISIONS

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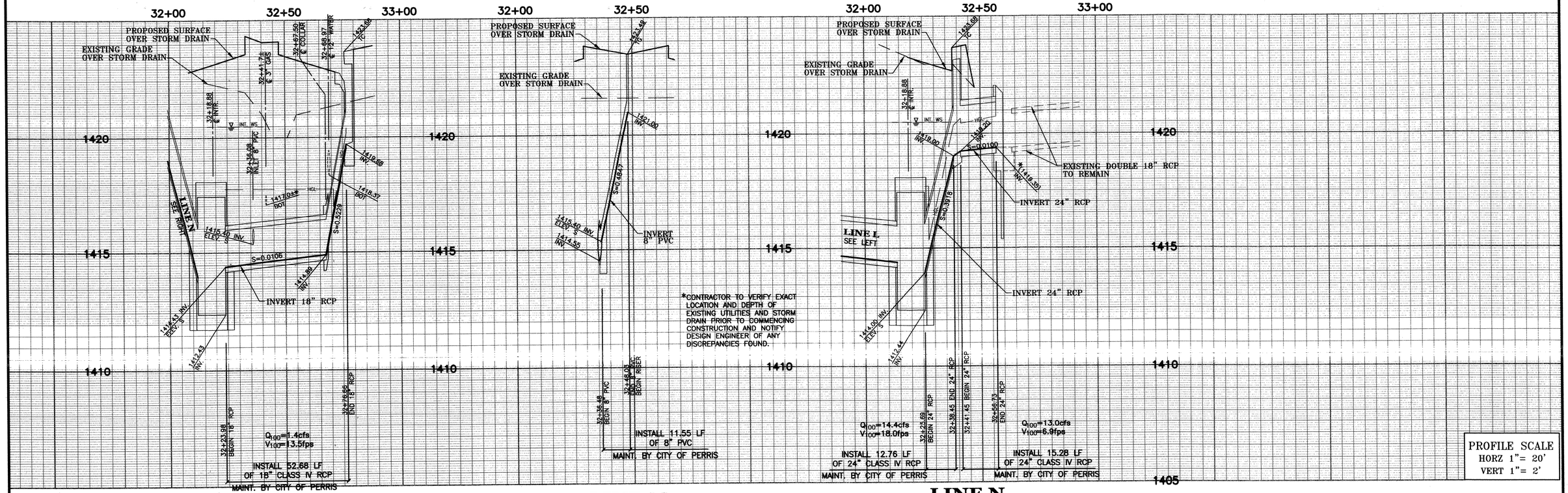
DESIGN BY: G. MELUSKI
DRAWN BY: J. NAPOLES
DATE DRAWN: JANUARY 2006
CHECKED BY: W.J. McKEEVER

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: — DATE:
APPROVED BY: — DATE:

PERRIS CROSSING
R.C.P.
LINES I, J AND K
PLAN AND PROFILE

PROJECT NUMBER P8-798
DRAWING NO.
SHEET NO. 7 OF 10

P-397



Q_{100}=1.4cfs
V_{100}=13.5fps

INSTALL 52.68 LF OF 18" CLASS IV RCP
MAINT. BY CITY OF PERRIS

INSTALL 11.55 LF OF 8" PVC
MAINT. BY CITY OF PERRIS

Q_{100}=14.4cfs
V_{100}=18.0fps

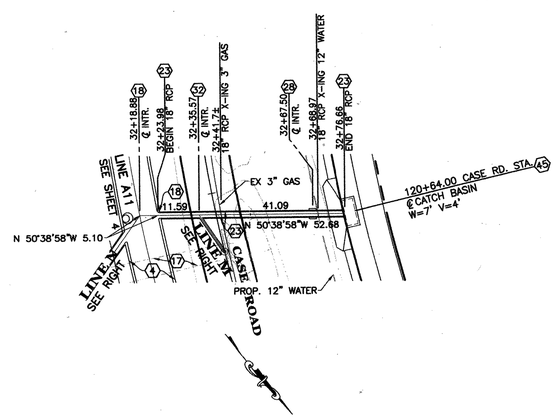
INSTALL 12.76 LF OF 24" CLASS IV RCP
MAINT. BY CITY OF PERRIS

Q_{100}=13.0cfs
V_{100}=6.9fps

INSTALL 15.28 LF OF 24" CLASS IV RCP
MAINT. BY CITY OF PERRIS

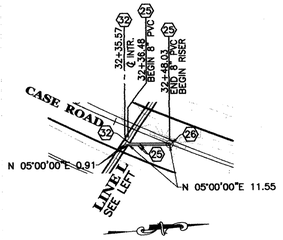
PROFILE SCALE
HORZ 1"= 20'
VERT 1"= 2'

LINE L PROFILE



LINE L PLAN

LINE M PROFILE

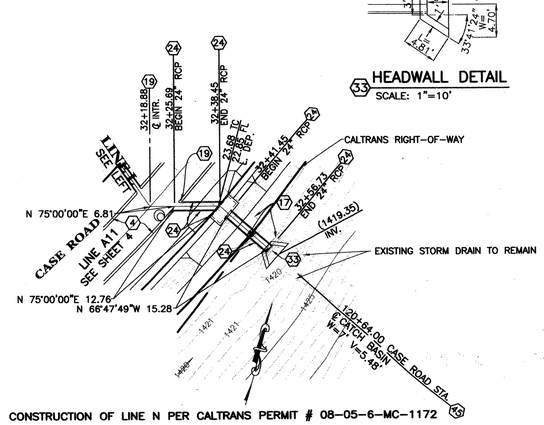


LINE M PLAN

Scale: 1" = 20'

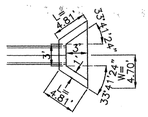
0 10 20 40 60 80

LINE N PROFILE



CONSTRUCTION OF LINE N PER CALTRANS PERMIT # 08-05-6-MC-1172

LINE N PLAN



HEADWALL DETAIL
SCALE: 1"=10'

CONSTRUCTION NOTES:

(4) CONSTRUCT REINFORCED CONCRETE BOX PER CALTRANS STD. PLAN D80A. 10' SPAN x 5' HEIGHT FLAT INVERT.

(17) REMOVE EXISTING STORM DRAIN LINES AND HEADWALL.

(18) CONSTRUCT JUNCTION STRUCTURE NO. 3 PER RCFCD STD. DWG. NO. JS228. A=78°43'51" D=18"

(19) CONSTRUCT JUNCTION STRUCTURE NO. 3 PER RCFCD STD. DWG. NO. JS228. A=46°55'07" D=24"

(23) INSTALL 18" CLASS IV RCP. SLOPE PER PLAN.

(24) INSTALL 24" CLASS IV RCP. SLOPE PER PLAN.

(25) INSTALL 8" PVC DRAIN LINE AND RISER IN MEDIAN.

(26) INSTALL 8" NDS-10 ROUND GRATES PER NATIONAL DIVERSIFIED SALES, INC. OR APPROVED EQUAL.

(28) CONSTRUCT CONCRETE COLLAR PER RCFCD STD. DWG. NO. M803.

(32) CONSTRUCT JUNCTION STRUCTURE NO. 3 PER RCFCD STD. DWG. NO. JS228. MODIFIED FOR 8" PVC. A=55°38'58" D=8

(33) CONSTRUCT HEADWALL PER CALTRANS STD. PLAN D90A TYPE A.

(45) CONSTRUCT CATCH BASIN NO. 1 PER RCFCD STD. DWG. NO. CB100.

AS-BUILT

W.J. McKEEVER, INC.
CIVIL ENGINEERING
647 NORTH MAIN STREET, SUITE 2A
RIVERSIDE, CALIFORNIA 92501
PH: (951) 341-3700
FAX: (951) 341-3740
WILLIAM J. McKEEVER, R.C.E. 22502 DATE

CITY OF PERRIS
CITY FILE NO. P8-798
APPROVED BY:
CITY ENGINEER DATE

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REVISIONS

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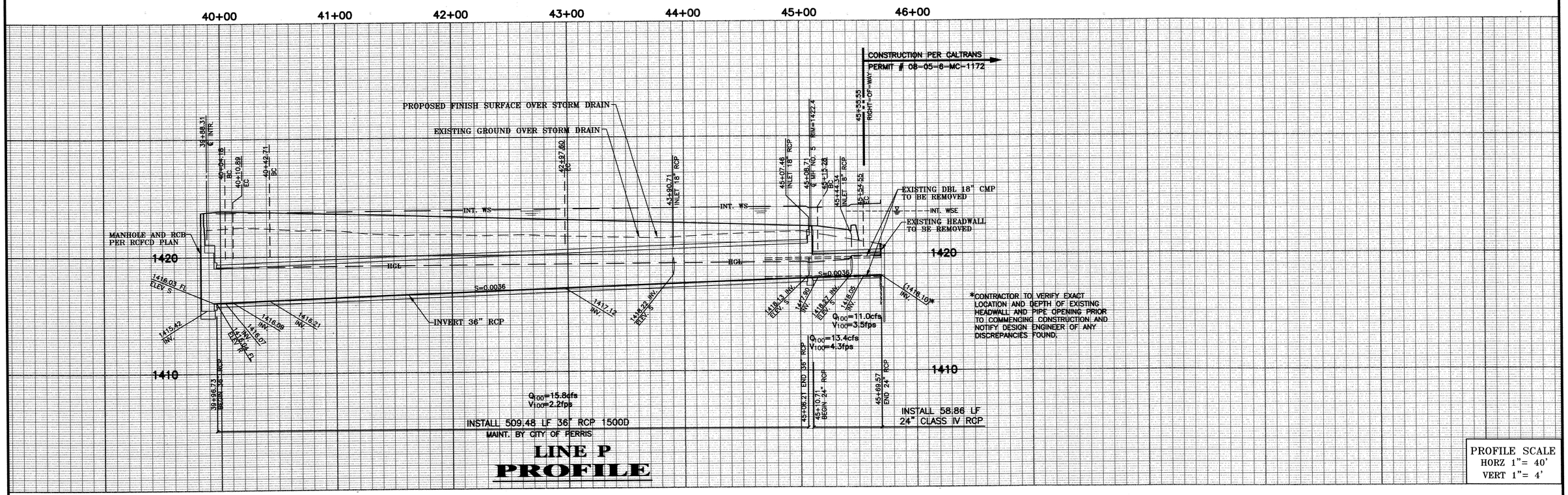
DESIGN BY: G. MELUSKI
DRAWN BY: J. NAPOLES
DATE DRAWN: JANUARY 2006
CHECKED BY: W.J. McKEEVER

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE:
APPROVED BY: DATE:

PERRIS CROSSING
R.C.P.
LINES L, M AND N
PLAN AND PROFILE

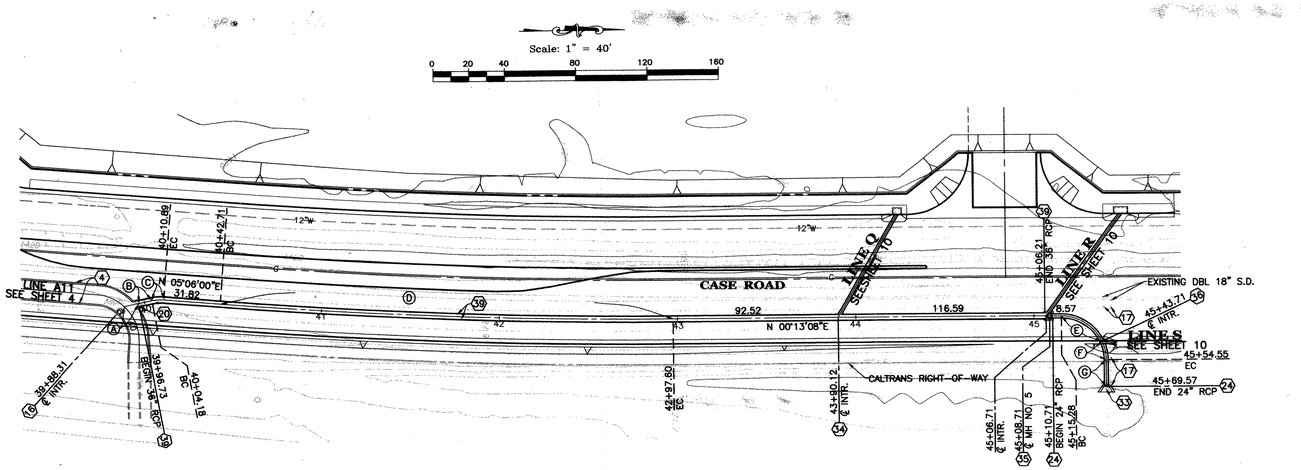
PROJECT NUMBER P8-798
DRAWING NO.
SHEET NO. 8 OF 10

P-397

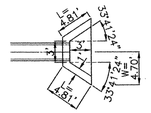


PROFILE SCALE
HORZ 1"= 40'
VERT 1"= 4'

LINE P
PROFILE



CONSTRUCTION OF LINE S PER CALTRANS PERMIT # 08-05-6-MC-1172



33 HEADWALL DETAIL
SCALE: 1"=10'

CONSTRUCTION NOTES:

4. CONSTRUCT REINFORCED CONCRETE BOX PER CALTRANS STD. PLAN D80A. 10' SPAN x 5' HEIGHT FLAT INVERT.
16. CONSTRUCT MANHOLE NO. 3 PER RCFCD STD. DWG. NO. MH253.
17. REMOVE EXISTING STORM DRAIN LINES AND HEADWALL.
20. CONSTRUCT JUNCTION STRUCTURE NO. 1 PER RCFCD STD. DWG. NO. JS226. A=52°40'09" B=36" C=8.84'
24. INSTALL 24" CLASS IV RCP. SLOPE PER PLAN.
33. CONSTRUCT HEADWALL PER CALTRANS STD. PLAN D90A TYPE A.
34. CONSTRUCT JUNCTION STRUCTURE NO. 2 PER RCFCD STD. DWG. NO. JS227. A=59°13'08" B=18" C=3.80' D=36" E=2.39' F=1.41' G=1.16' L=2.61'
35. CONSTRUCT MANHOLE NO. 1 PER RCFCD STD. DWG. NO. MH251
36. CONSTRUCT JUNCTION STRUCTURE NO. 2 PER RCFCD STD. DWG. NO. JS227. A=56°31'55" B=18" C=3.13' D=24" E=2.01' F=0.99' G=0.81' L=2.50'
39. INSTALL 36" RCP 1500D. SLOPE PER PLAN.

CURVE / LINE DATA				
	DELTA/BEARING	RADIUS	LENGTH	TANGENT
A	N 10°17'22"W	–	8.42	–
B	N 10°17'22"W	–	7.45	–
C	15°23'22"	25.00	6.71	3.38
D	04°52'52"	2992.00	254.89	127.52
E	65°09'55"	25.00	28.43	15.98
F	24°50'05"	25.00	10.84	5.50
G	N 89°46'52"W	–	15.02	–

REGISTERED PROFESSIONAL ENGINEER
WILLIAM J. McKEEVER
No. 22502
Exp. 12-31-07
CIVIL
STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER
WILLIAM J. McKEEVER
No. 22502
Exp. 12-31-09
CIVIL
STATE OF CALIFORNIA

AS BUILT 4/09

LINE P
PLAN

W.J. McKEEVER, INC.
CIVIL ENGINEERING
647 NORTH MAIN STREET, SUITE 2A
RIVERSIDE, CALIFORNIA 92501
PH.: (951) 341-3700
FAX: (951) 341-3740
WILLIAM J. McKEEVER, R.C.E. 22502 DATE 12/18/06

CITY OF PERRIS
CITY FILE NO. P8-798
APPROVED BY:
CITY ENGINEER DATE 12-26-06

DIG ALERT
CALL: TOLL FREE
1-800
227-2600
TWO WORKING DAYS BEFORE YOU DIG

BENCHMARK:
RIVERSIDE COUNTY BENCHMARK BRASS DISK STAMPED "600-31-68" 700' N OF INT. MURRIETA RD & ETHANAC RD, 40' W OF MURRIETA ROAD 3' NE OF THE SE CORN. OF 8' CLF OF EMWD MURRIETA PUMP STA. 2' N OF A MARKER POST. ELEVATION = 1414.416 FT (5/85)

REVISIONS			
REF.	DESCRIPTION	APPR.	DATE
1	AS BUILT NO REVISIONS		

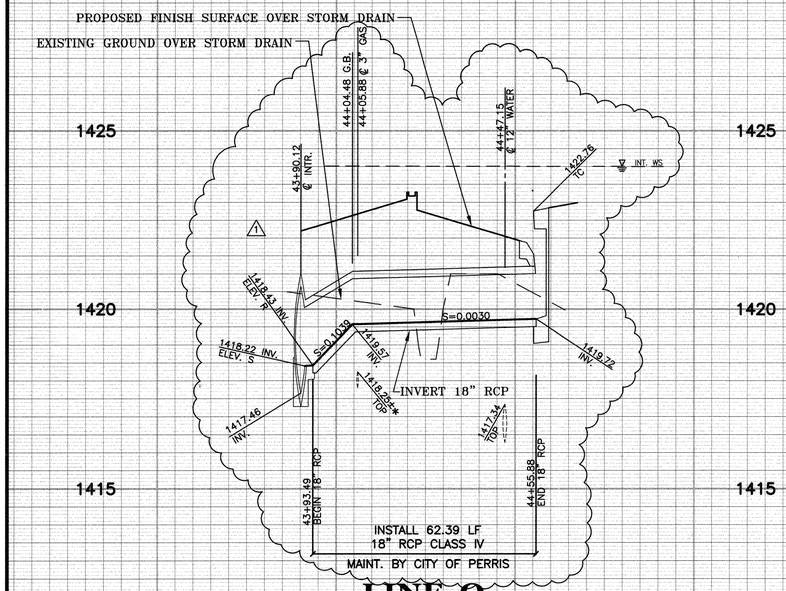
DESIGN BY: G. MELUSKI
DRAWN BY: J. NAPOLES
DATE DRAWN: JANUARY 2006
CHECKED BY: W.J. McKEEVER

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL: DATE:
APPROVED BY: DATE:

PERRIS CROSSING
R.C.P.
LINE P
PLAN AND PROFILE

PROJECT NUMBER P8-798
DRAWING NO.
SHEET NO. 9 OF 10

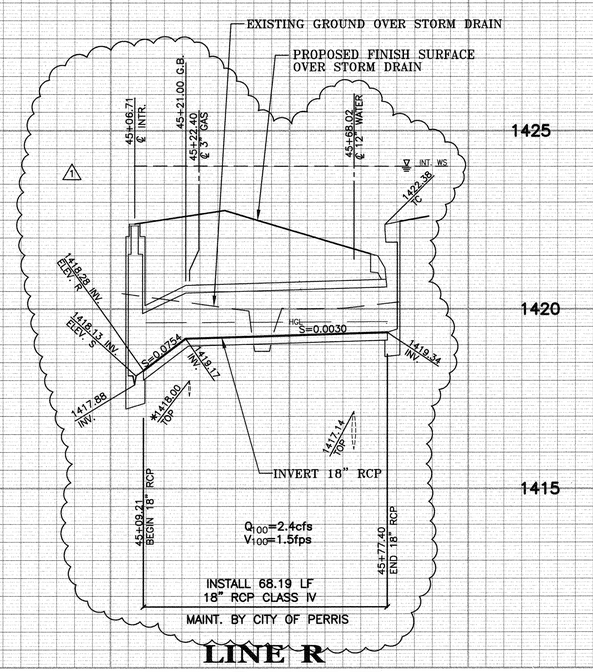
P-397



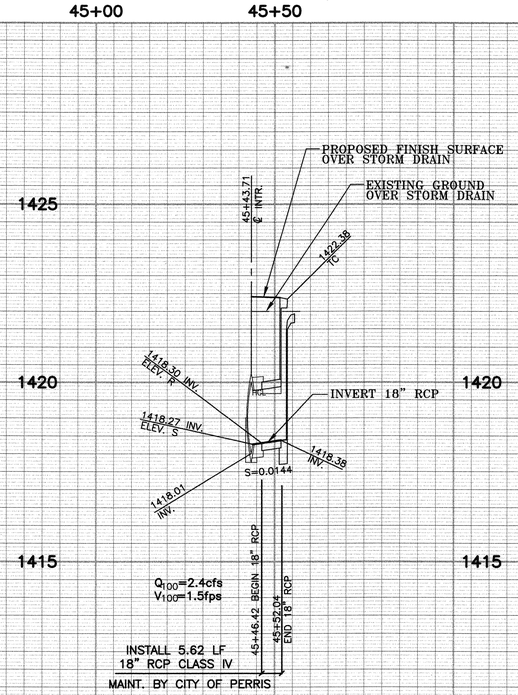
LINE Q PROFILE

*CB FOR NUISANCE FLOWS ONLY

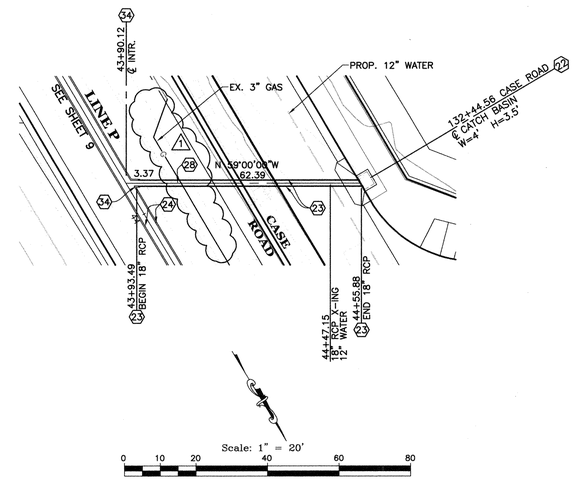
PROFILE SCALE
HORZ 1"= 20'
VERT 1"= 2'



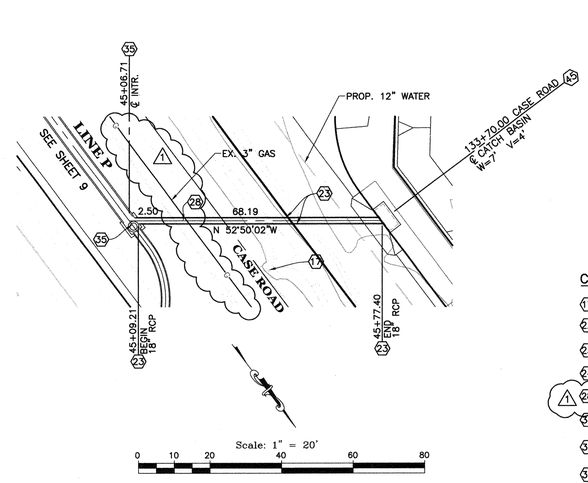
LINE R PROFILE



LINE S PROFILE



LINE Q PLAN



LINE R PLAN

CURVE / LINE DATA				
◯	DELTA/BEARING	RADIUS	LENGTH	TANGENT
(A)	N 10°17'22"W	–	8.09	–
(B)	N 10°17'22"W	–	8.24	–
(C)	15°23'22"	25.00	6.71	3.38
(D)	04°52'52"	2992.00	254.89	127.52
(E)	65°09'55"	25.00	28.43	15.98
(F)	24°50'05"	25.00	10.84	5.50
(G)	N 89°46'52"W	–	15.02	–

CONSTRUCTION NOTES:

(17) REMOVE EXISTING STORM DRAIN LINES AND HEADWALL.

(22) CONSTRUCT CATCH BASIN PER COUNTY OF RIVERSIDE STD. NO. 300.

(23) INSTALL 18" CLASS IV RCP. SLOPE PER PLAN.

(24) INSTALL 24" CLASS IV RCP. SLOPE PER PLAN.

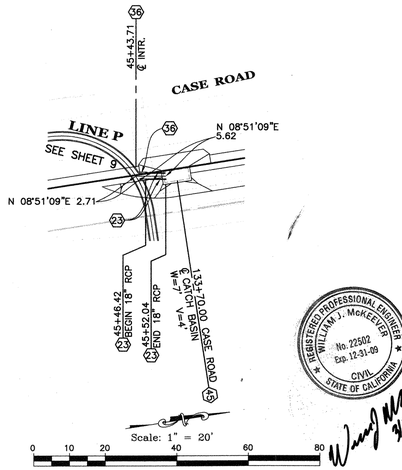
(1/28) CONSTRUCT CONCRETE COLLAR PER RCFCD STD. DWG. NO. M803.

(34) CONSTRUCT JUNCTION STRUCTURE NO. 2 PER RCFCD STD. DWG. NO. JS227. A=59°13'08" B=18" C=3.37' D=24" E=2.05' F=0.91' G=0.66' L=2.61'

(35) CONSTRUCT JUNCTION STRUCTURE NO. 2 PER RCFCD STD. DWG. NO. JS227. A=53°03'10" B=18" C=3.64' D=24" E=2.34' F=1.00' G=0.80' L=2.80'

(36) CONSTRUCT JUNCTION STRUCTURE NO. 2 PER RCFCD STD. DWG. NO. JS227. A=56°31'55" B=18" C=3.13' D=24" E=2.01' F=0.99' G=0.81' L=2.50'

(45) CONSTRUCT CATCH BASIN NO. 1 PER RCFCD STD. DWG. NO. CB100.



LINE S PLAN

REGISTERED PROFESSIONAL ENGINEER WILLIAM J. McKEEVER No. 22502 Exp. 12-31-07 CIVIL STATE OF CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER WILLIAM J. McKEEVER No. 22502 Exp. 12-31-09 CIVIL STATE OF CALIFORNIA

AS BUILT

W.J. McKEEVER, INC.
CIVIL ENGINEERING
647 NORTH MAIN STREET, SUITE 2A
RIVERSIDE, CALIFORNIA 92501
PH.: (951) 341-3700
FAX: (951) 341-3740
WILLIAM J. McKEEVER, R.C.E. 22502 DATE 6/6/07

CITY OF PERRIS
CITY FILE NO. P8-798
APPROVED BY:
CITY ENGINEER DATE 7-13-07

DIG ALERT
CALL: TOLL FREE
1-800
227-2600
TWO WORKING DAYS BEFORE YOU DIG!

BENCHMARK:
RIVERSIDE COUNTY BENCHMARK BRASS DISK STAMPED "600-31-68" 700' N OF INT. MURRIETA RD & ETHANAC RD, 40' W OF MURRIETA ROAD 3' NE OF THE SE CORN. OF 8' CLF OF EMWD MURRIETA PUMP STA. 2' N OF A MARKER POST. ELEVATION = 1414.416 FT (5/85)

REVISIONS			
REF.	DESCRIPTION	APPR.	DATE
2	AS BUILT NO REVISIONS		
1	REVISED STORM DRAIN TO CLEAR GAS LINE		7-13-07

DESIGN BY: G. MELUSKI
DRAWN BY: J. NAPOLES
DATE DRAWN: JANUARY 2006
CHECKED BY: W.J. McKEEVER

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL: DATE:
APPROVED BY: DATE:

PERRIS CROSSING R.C.P. LINES Q,R AND S

PLAN AND PROFILE

PROJECT NUMBER P8-798
DRAWING NO.
SHEET NO. 10 OF 10

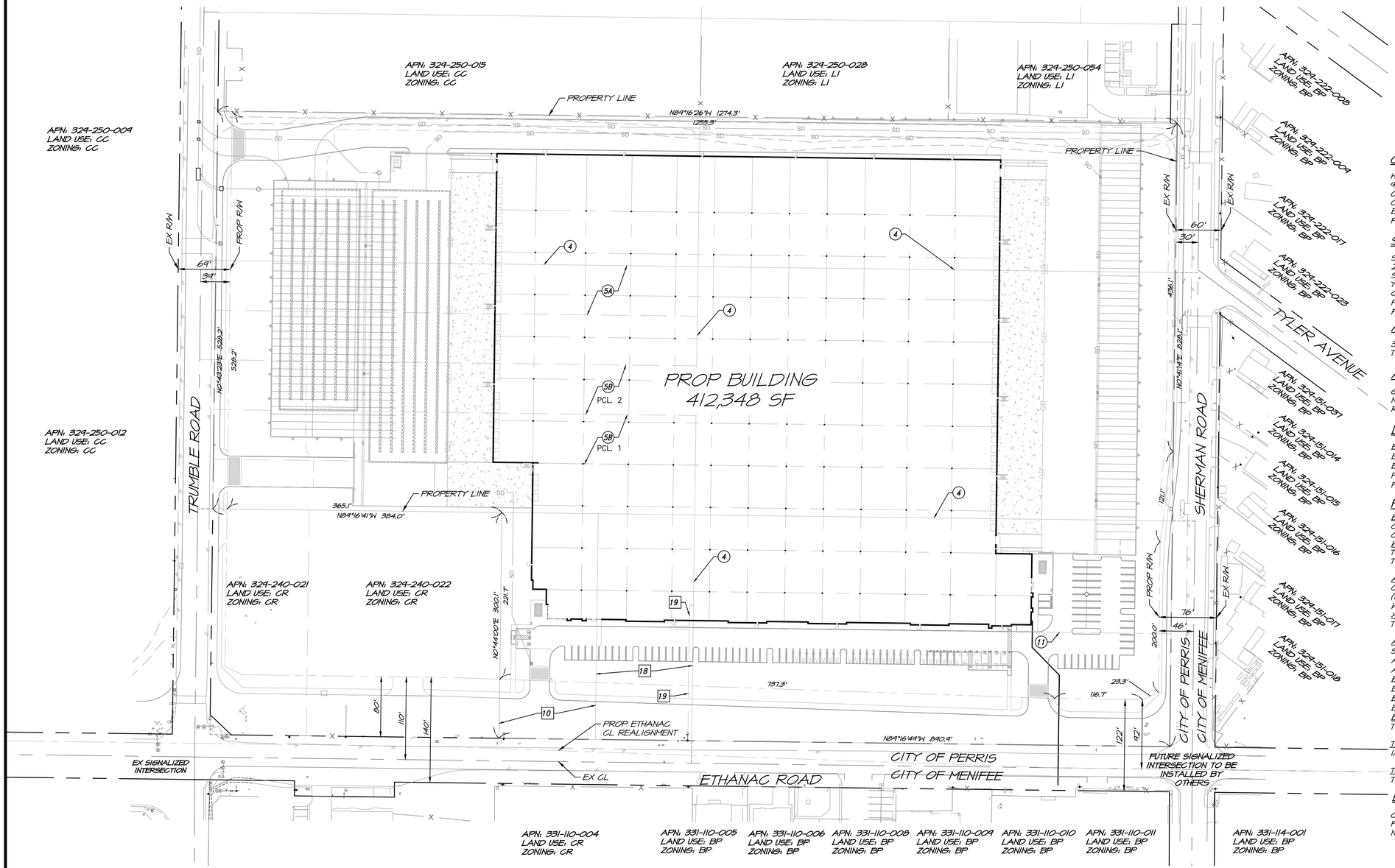
P-397

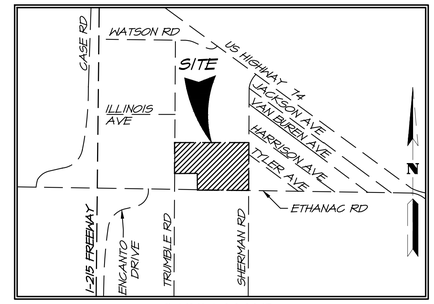
DEVELOPMENT PLAN REVIEW 22-00030

IN THE CITY OF PERRIS, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA

DEVELOPMENT PLAN REVIEW NO. 22-00030

LOCATED IN SECTION 10 SW, T. 5S., R. 3W., S.B.M.





VICINITY MAP
NTS

OWNER/APPLICANT

HILLWOOD INVESTMENT PROPERTIES
901 VIA PIEMONTE STE. 175
ONTARIO CA, 91764
CONTACT: JOHN GRACE
EMAIL: JOHN.GRACE@HILLWOOD.COM
PHONE: (909) 256-5424

PROJECT REPRESENTATIVE

ALBERT A. WEBB ASSOCIATES
3788 MCCRAY STREET
RIVERSIDE, CA 92506
CONTACT: RICHARD BELMUDEZ
PHONE: (951) 686-1070
FAX: (951) 788-1256

SOILS ENGINEER

SOUTHERN CALIFORNIA GEOTECHNICAL
22885 E. SAVI RANCH PARKWAY,
SUITE E
YORBA LINDA, CA 92887
CONTACT: ROBERT TRAZO
PHONE: (714) 685-1115
FAX: (714) 685-1118

ENGINEER

ALBERT A. WEBB ASSOCIATES
3788 MCCRAY STREET
RIVERSIDE, CA 92506
CONTACT: SARAH KOWALSKI
PHONE: (951) 686-1070
FAX: (951) 788-1256

A.P.N.

324-240-016 THRU -020, -023,
THRU -027

ARCHITECT

HPA ARCHITECTS
18831 BARDEEN AVE., STE 100
IRVINE, CA 92612
CONTACT: INKON KIM
PHONE: (949) 863-1770
EMAIL: INKON@HPARCHS.COM

ACREAGE

GROSS	21.6 AC
NET	19.9 AC
R/W	1.7 AC

TOPOGRAPHY SOURCE

TOPOGRAPHY FLOWN BY INLAND AERIAL SURVEYS INC. ON 02/15/2022

LAND USE

EXISTING LAND USE: VACANT
EXISTING GENERAL PLAN LAND USE: COMMERCIAL COMMUNITY (CC)
EXISTING ZONING: COMMERCIAL COMMUNITY (CC)
PROPOSED GENERAL PLAN LAND USE: LIGHT INDUSTRIAL (LI)
PROPOSED ZONING: LIGHT INDUSTRIAL (LI)

PROJECT DATA

BUILDING AREA	
OFFICE - FIRST FLOOR	10,000 SF
OFFICE - SECOND FLOOR	5,000 SF
WAREHOUSE	397,348 SF
TOTAL BUILDING FOOTPRINT	407,348 SF
TOTAL FLOOR AREA	412,348 SF
AUTO PARKING REQUIRED	
OFFICE:	
(1 STALL/300 SF IF LESS THAN 10% GFA)	N/A
WAREHOUSE:	
>40K SF @ (30 STALLS + 1 STALL/5,000 SF)	105 STALLS
TOTAL	105 STALLS
AUTO PARKING PROVIDED	
STANDARD (9' x 19')	76 STALLS
ADA STANDARD (9' x 19')	3 STALLS
ADA VAN (12' x 19')	2 STALLS
EV ADA STANDARD (9' x 19')	1 STALLS
EV ADA VAN (12' x 19')	1 STALLS
EV AMBULATORY (10' x 19')	1 STALLS
EVCS STANDARD (9' x 19')	3 STALLS
EV CALPABLE (9' x 19')	19 STALLS
TOTAL	106 STALLS
TRAILER PARKING REQUIRED	
1/ 5,000 SF	82 STALLS
TRAILER PARKING PROVIDED	
TYPICAL TRAILER (10' x 55')	157 STALLS

EARTHWORK ESTIMATE

CUT:	15,600 CY
FILL:	66,100 CY
NET:	50,500 CY (FILL)

SHEET INDEX

SHEET 1 - TITLE SHEET
SHEET 2 - STREET AND GRADING SECTIONS
SHEET 3 - CONCEPTUAL GRADING
SHEETS 4,5 - CONCEPTUAL UTILITIES

PRELIMINARY

GENERAL INFORMATION

1. ALL PARCELS WITHIN PROJECT BOUNDARY TO BE COMBINED VIA PARCEL MAP
2. THOMAS BROS. MAP BOOK PAGE: 838, GRID: C1 AND D1
3. PROJECT IS NOT WITHIN A SPECIFIC PLAN.
4. PROJECT LIES WITHIN THE CITY OF PERRIS REDEVELOPMENT PROJECT AREA.
5. PROJECT LIES WITHIN CFD NO. 1.
6. EASEMENTS OF RECORD ARE PLOTTED HEREIN.
7. PROJECT IS WITHIN EASTERN MUNICIPAL WATER DISTRICT
8. THERE ARE NO EXISTING WELLS ON THE PROPERTY.
9. ALL SLOPES ARE 2:1 RATIO, UNLESS OTHERWISE NOTED.
10. LAND IS NOT WITHIN A SPECIAL STUDIES ZONE.
11. LAND HAS LOW POTENTIAL FOR LIQUEFACTION PER SOCAL GEO REPORT DATED 02/23/2022.
12. SUB-SURFACE SEPTIC DISPOSAL IS NOT INTENDED ON SITE.
13. STRUCTURES AND/OR DWELLINGS DO NOT EXIST ON SITE.
14. THE PROJECT WILL COMPLY WITH NPDES REQUIREMENTS AS REQUIRED BY NPDES SUPPLEMENT "A".
15. FLOOD ZONE X, AREA OF LOW FLOODING PER FEMA PANEL 06065C2060H.
16. PROJECT LIES WITHIN AIRPORT LAND USE COMPATIBILITY ZONE D.
17. ARCHITECTURAL SITE PLAN PROVIDED BY HPA ARCHITECTURE ON 04/12/23

UTILITY PROVIDERS

WATER:	EASTERN MUNICIPAL WATER DISTRICT PHONE: (951) 685-7434
SEWER:	EASTERN MUNICIPAL WATER DISTRICT PHONE: (951) 685-7434
GAS:	SOUTHERN CALIFORNIA GAS COMPANY PHONE: (909) 307-7070
ELECTRIC:	SOUTHERN CALIFORNIA EDISON PHONE: 1 (800) 655-4555
TELEPHONE:	CHARTER COMMUNICATIONS (SPECTRUM) PHONE: (951) 406-1666
CABLE T.V.:	FRONTIER COMMUNICATIONS PHONE: (310) 264-5100
SCHOOL DISTRICT(S):	ROMOLAND SCHOOL DISTRICT (TK-8) PHONE: (951) 926-9244 PERRIS UNION HIGH SCHOOL DISTRICT (9-12) PHONE: (951) 943-6369

EASEMENT NOTES

SEE SHEET 2

LEGAL DESCRIPTION

SEE SHEET 2

N
W WEBB E
S

1" = 70'
70 0 70 140 210

REVISIONS	DATE	BY
PUBLIC DETENTION BASIN ADDED	4/23	AG

CITY OF PERRIS

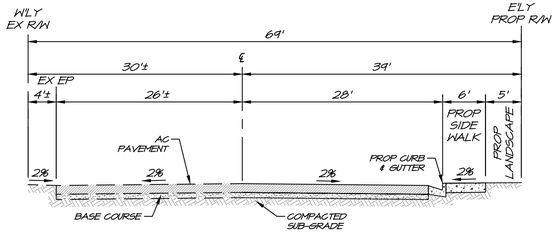
ETHANAC LOGISTICS CENTER
TITLE SHEET
DEVELOPMENT PLAN REVIEW NO. 22-00030

SCALE:	1" = 70'
DATE:	9/1/2023
DESIGNED:	AG
CHECKED:	SK
PLN CK REF:	
F.B.	

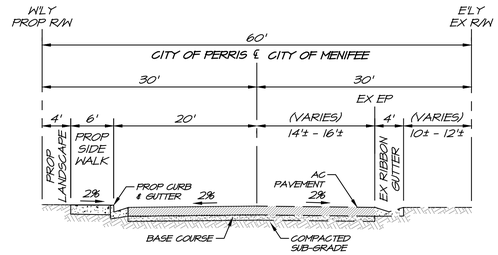
ALBERT A. WEBB ASSOCIATES
ENGINEERING CONSULTANTS
3788 McCRAY STREET
RIVERSIDE CA. 92506
PH. (951) 686-1070
FAX (951) 788-1256

W.O. 22-0198
SHEET 1
OF 5 SHEETS
DWG. NO.

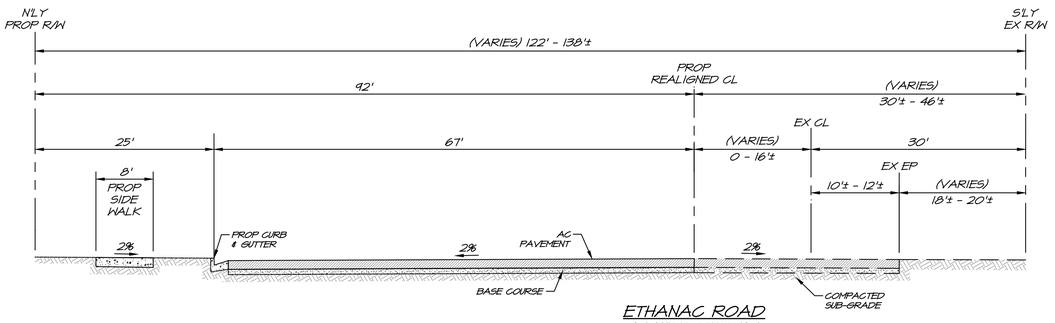
H:\2022\22-0198\DRAWINGS\ENTITLEMENT\22-0198-C-PP.DWG 9/1/2023 4:00:02 PM Rebecca



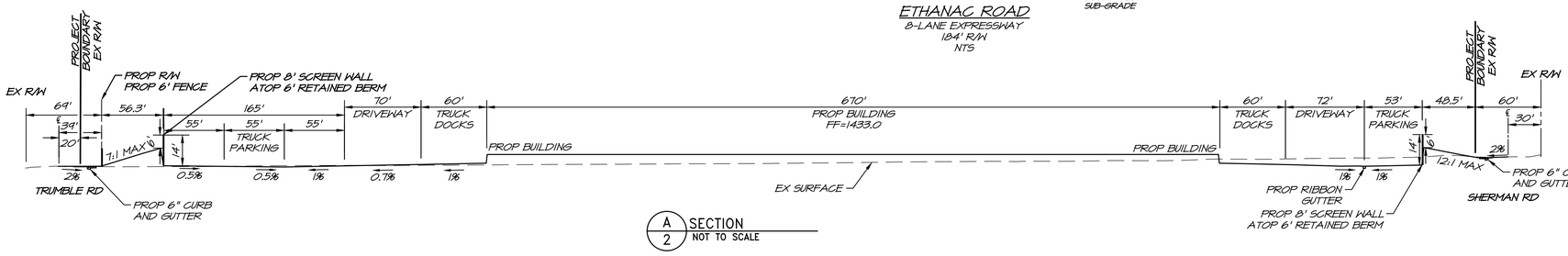
TRUMBLE ROAD
MAJOR COLLECTOR
78' R/W
NTS



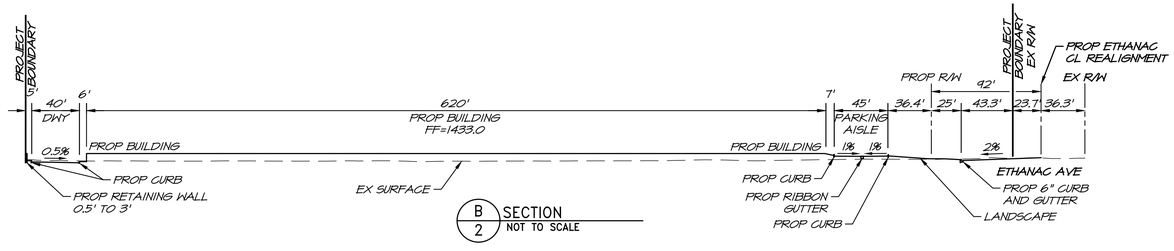
SHERMAN ROAD
LOCAL
60' R/W
NTS



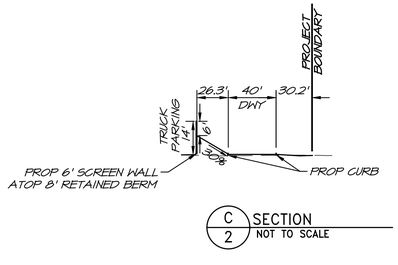
ETHANAC ROAD
8-LANE EXPRESSWAY
184' R/W
NTS



A/2 SECTION
NOT TO SCALE



B/2 SECTION
NOT TO SCALE



C/2 SECTION
NOT TO SCALE

EASEMENT NOTES

APN: 324-240-016 THRU -020 AND 324-240-025 THRU -027.

(4.) AN EASEMENT FOR PUBLIC UTILITIES AND INCIDENTAL PURPOSES, RECORDED JUNE 25, 1927 IN BOOK 120 OF DEEDS, PAGE 209, IN FAVOR OF SOUTHERN SIERRAS POWER COMPANY. THE LOCATION OF THE EASEMENT CANNOT BE DETERMINED FROM RECORD INFORMATION.

5. COVENANTS, CONDITIONS, RESTRICTIONS AND EASEMENTS IN THE DOCUMENT RECORDED APRIL 17, 1934 AS BOOK 170, PAGE 305 AND JANUARY 13, 1936 IN BOOK 259, PAGE 560 (BOTH) OF OFFICIAL RECORDS, BUT DELETING ANY COVENANT, CONDITION OR RESTRICTION INDICATING A PREFERENCE, LIMITATION OR DISCRIMINATION BASED ON RACE, COLOR, RELIGION, SEX, HANDICAP, FAMILIAL STATUS, NATIONAL ORIGIN, SEXUAL ORIENTATION, MARITAL STATUS, ANCESTRY, SOURCE OF INCOME OR DISABILITY, TO THE EXTENT SUCH COVENANTS, CONDITIONS OR RESTRICTIONS VIOLATE TITLE 42, SECTION 3604(C,) OF THE UNITED STATES CODES, LAWFUL RESTRICTIONS UNDER STATE AND FEDERAL LAW ON THE AGE OF OCCUPANTS IN SENIOR HOUSING OR HOUSING FOR OLDER PERSONS SHALL NOT BE CONSTRUED AS RESTRICTIONS BASED ON FAMILIAL STATUS.
[(5A) BOOK 170, PAGE 305 & (5B) BOOK 259, PAGE 560]

(11.) AN EASEMENT FOR PUBLIC UTILITIES AND INCIDENTAL PURPOSES, RECORDED AUGUST 8, 1947 AS BOOK 846, PAGE 355 OF OFFICIAL RECORDS. IN FAVOR OF CALIFORNIA ELECTRIC POWER COMPANY.
[℄ OF UNDISCLOSED WIDTH]

APN: 324-240-023 AND -024

10. COVENANTS, CONDITIONS, RESTRICTIONS AND EASEMENTS IN THE DOCUMENT RECORDED APRIL 24, 1933 AS BOOK 120, PAGE 347 OF OFFICIAL RECORDS, WHICH PROVIDE THAT A VIOLATION THEREOF SHALL NOT DEFEAT OR RENDER INVALID THE LIEN OF ANY FIRST MORTGAGE OR DEED OF TRUST MADE IN GOOD FAITH AND FOR VALUE, BUT DELETING ANY COVENANT, CONDITION OR RESTRICTION INDICATING A PREFERENCE, LIMITATION OR DISCRIMINATION BASED ON RACE, COLOR, RELIGION, SEX, HANDICAP, FAMILIAL STATUS, NATIONAL ORIGIN, SEXUAL ORIENTATION, MARITAL STATUS, ANCESTRY, SOURCE OF INCOME OR DISABILITY, TO THE EXTENT SUCH COVENANTS, CONDITIONS OR RESTRICTIONS VIOLATE TITLE 42, SECTION 3604(C), OF THE UNITED STATES CODES OR SECTION 12955 OF THE CALIFORNIA GOVERNMENT CODE. LAWFUL RESTRICTIONS UNDER STATE AND FEDERAL LAW ON THE AGE OF OCCUPANTS IN SENIOR HOUSING OR HOUSING FOR OLDER PERSONS SHALL NOT BE CONSTRUED AS RESTRICTIONS BASED ON FAMILIAL STATUS.

18. EASEMENTS, COVENANTS AND CONDITIONS CONTAINED IN THE DEED FROM ETHANAC RANCHO, LTD, AS GRANTOR, TO PHILA M. LAUDIG, AS GRANTEE, RECORDED APRIL 24, 1933 AS BOOK 123, PAGE 42 OF OFFICIAL RECORDS. REFERENCE BEING MADE TO THE DOCUMENT FOR FULL PARTICULARS.
[BLANKET IN NATURE]

19. AN EASEMENT FOR TELEPHONE LINE, CONSISTING OF POLES, NECESSARY GUYS AND ANCHORS, BRACES, CROSS-ARMS, WIRE, CONDUITS, CABLES, AND OTHER FIXTURES AND APPLIANCES, FOR CONVEYING ELECTRIC ENERGY TO BE USED FOR COMMUNICATION, TELEPHONE, TELEGRAPH AND/OR OTHER PURPOSES AND ACCESS FOR EXERCISING THE RIGHTS AND INCIDENTAL PURPOSES, RECORDED SEPTEMBER 18, 1961 AS INSTRUMENT NO. 79475, BOOK 2483, PAGE 446 OF OFFICIAL RECORDS, IN FAVOR OF CALIFORNIA WATER & TELEPHONE COMPANY, A CORPORATION, AND ITS SUCCESSORS.

LEGAL DESCRIPTION

APN: 324-240-016 (AFFECTS THE PORTION OF LOT 133), **324-240-017** (AFFECTS THE PORTION OF LOT 134), **324-240-018** (AFFECTS THE PORTION OF LOT 134), **324-240-019** (AFFECTS THE PORTION OF LOT 134), **324-240-020** (AFFECTS THE PORTION OF LOT 134), **324-240-026** (AFFECTS THE LOT 137), **324-240-027** (AFFECTS THE PORTION OF LOT 138), **324-240-025** (AFFECT LOT 136).

REAL PROPERTY IN THE CITY OF PERRIS, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, DESCRIBED AS FOLLOWS:

PARCEL A:
LOTS 134, 137 AND THE SOUTH 198 FEET OF LOTS 133 AND 138 OF RAMOLA FARMS NO. 6A, IN THE CITY OF PERRIS, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN BY MAP ON FILE IN BOOK 14, PAGES 63, 64, AND 65 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

PARCEL B:
LOT 136 OF RAMOLA FARMS NO. 6A, IN THE CITY OF PERRIS, COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS SHOWN BY MAP ON FILE IN BOOK 14, PAGES 63, 64, AND 65 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

APN: 324-240-023 (AFFECTS PARCEL A) AND **324-240-024** (AFFECTS PARCEL B)

PARCEL A:

THE WESTERLY 128.00 FEET OF THE EASTERLY 256.00 FEET OF LOT 135 OF ROMOLA FARMS NO. 6-A, IN THE COUNTY OF RIVERSIDE, STATE OF CALIFORNIA, AS PER MAP RECORDED IN BOOK 14, PAGES 63, 64 AND 65 OF MAPS, IN THE OFFICE OF THE COUNTY RECORDER OF SAID COUNTY.

PARCEL B:

THAT PORTION OF LOT 135 OF ROMOLA FARMS NO. 6A, AS SHOWN BY MAP OF SAID TRACT ON FILE IN BOOK 14, PAGES 63, 64, AND 65 OF MAPS, RIVERSIDE COUNTY RECORDS, DESCRIBED AS FOLLOWS:

BEGINNING AT THE SOUTHEAST CORNER OF SAID LOT 135; THENCE WEST, ON THE SOUTH LINE OF SAID LOT, 128 FEET; THENCE NORTH, PARALLEL WITH THE EAST LINE OF SAID LOT, 300 FEET, TO A POINT ON THE NORTH LINE OF SAID LOT, 128 FEET WEST OF THE NORTHEAST CORNER THEREOF; THENCE EAST, ON THE NORTH LINE OF SAID LOT, 128 FEET, TO THE NORTHEAST CORNER THEREOF; THENCE SOUTH, ON THE EAST LINE OF SAID LOT, 300 FEET, TO THE POINT OF BEGINNING.

PRELIMINARY

REVISIONS	DATE	BY
REVISED SECTIONS FOR PUBLIC DETENTION BASIN	4/23	AG

CITY OF PERRIS

ETHANAC LOGISTICS CENTER
GRADING AND STREET SECTIONS
DEVELOPMENT PLAN REVIEW NO. 22-00030

SCALE: NTS	ALBERT A. WEBB ASSOCIATES	W.O. 22-0198	
DATE: 9/1/2023	ENGINEERING CONSULTANTS 3788 McCRAY STREET RIVERSIDE, CA. 92506 PH. (951) 686-1070 FAX (951) 788-1256	SHEET 2	
DESIGNED: AG		OF 5 SHEETS	
CHECKED: SK			
PLN CK REF:		DWG. NO.	
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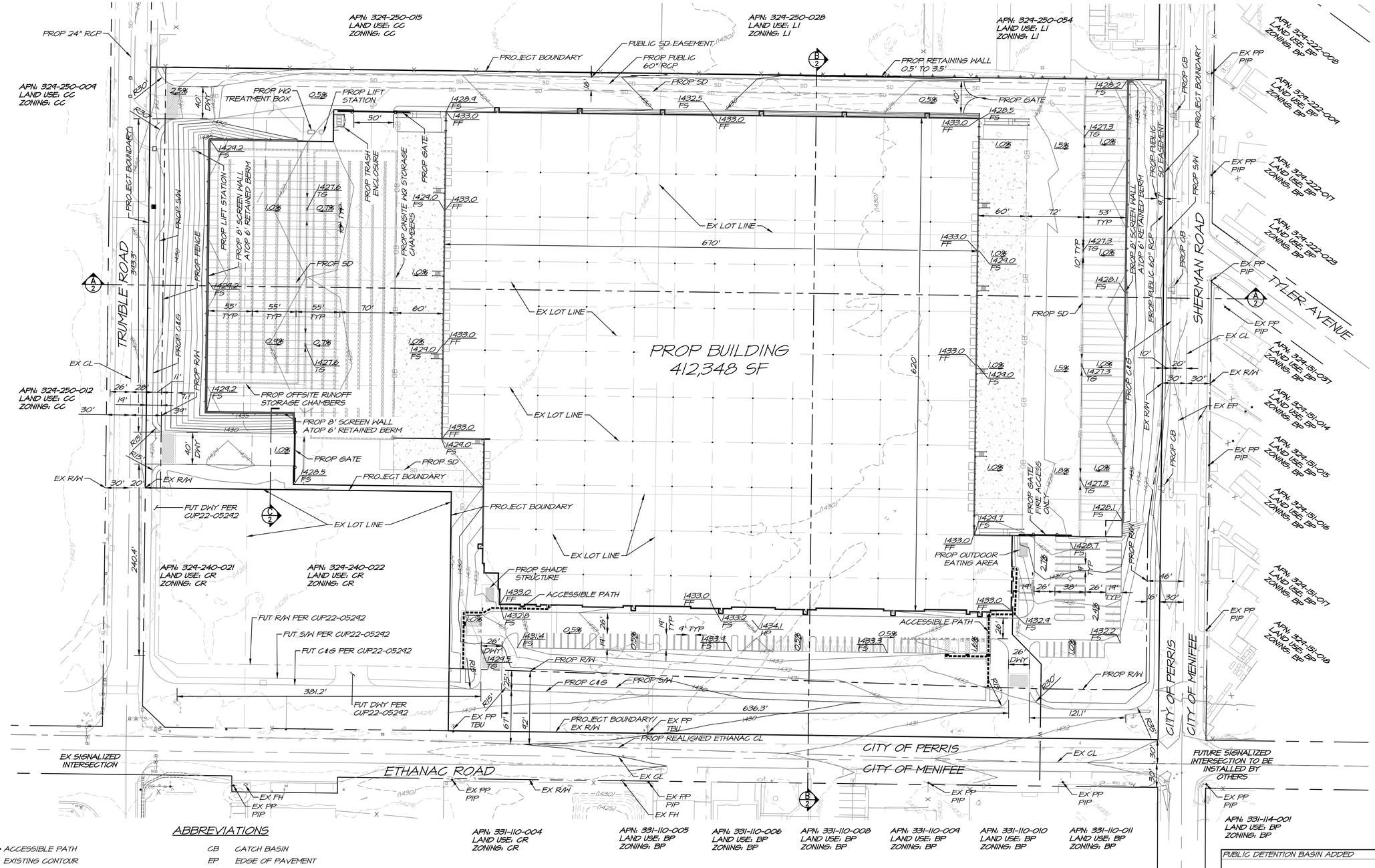

LEGEND

- ACCESSIBLE PATH
- (1430) EXISTING CONTOUR
- EXISTING CENTER LINE
- EXISTING EASEMENT
- EXISTING EDGE OF PAVEMENT
- X EXISTING FENCE
- EXISTING LOT LINE
- GB GRADE BREAK
- PROJECT BOUNDARY
- PROPOSED CENTER LINE
- 1430 PROPOSED CONTOUR
- PROPOSED CURB
- PROP/EX RIGHT OF WAY

ABBREVIATIONS

CB	CATCH BASIN
EP	EDGE OF PAVEMENT
EX	EXISTING
FF	FINISHED FLOOR
FH	FIRE HYDRANT
FS	FINISHED SURFACE
PIP	PROTECT IN PLACE
PROP	PROPOSED
R/W	RIGHT-OF-WAY
RCB	REINFORCED CONCRETE BOX
RCP	REINFORCED CONCRETE PIPE
S/W	SIDEWALK
TBU	TO BE UNDERGROUNDED
TG	TOP OF GRATE
TYP	TYPICAL

N W WEBB E S

1" = 60'

60 0 60 120 180

REVISIONS	DATE	BY
PUBLIC DETENTION BASIN ADDED	4/23	AG

PRELIMINARY

CITY OF PERRIS

ETHANAC LOGISTICS CENTER
CONCEPTUAL GRADING
DEVELOPMENT PLAN REVIEW NO. 22-00030

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ALBERT A. WEBB ASSOCIATES
ENGINEERING CONSULTANTS
3788 McCRAY STREET
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LAND USE: CC
ZONING: CC

APN: 324-250-028
LAND USE: LI
ZONING: LI

APN: 324-250-054
LAND USE: LI
ZONING: LI

APN: 324-250-009
LAND USE: CC
ZONING: CC

APN: 324-250-012
LAND USE: CC
ZONING: CC

APN: 324-240-021
LAND USE: CR
ZONING: CR

APN: 324-240-022
LAND USE: CR
ZONING: CR

APN: 331-110-004
LAND USE: CR
ZONING: CR

APN: 331-110-005
LAND USE: BP
ZONING: BP

APN: 331-110-006
LAND USE: BP
ZONING: BP

APN: 331-110-008
LAND USE: BP
ZONING: BP

APN: 331-110-009
LAND USE: BP
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APN: 331-110-010
LAND USE: BP
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LAND USE: BP
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LAND USE: BP
ZONING: BP

APN: 324-151-017
LAND USE: BP
ZONING: BP

APN: 324-151-018
LAND USE: BP
ZONING: BP

PROJECT BOUNDARY
PUBLIC SD EASEMENT
PROP PUBLIC 60" RCP
PROP RETAINING WALL 0.5' TO 3.5'
PROP PUBLIC 36" RCP
PROP PUBLIC 18" RCP
PROP PUBLIC 24" RCP
PROP PUBLIC 18" RCP
PROP STORM WATER TREATMENT BOX
PROP LIFT STATION
PROP LIFT STATION
PROP WATER
PROP SD
PROP SD
EX TELEPHONE
EX 2" GAS
EX ELECTRIC
EX 18" SEWER
EX 12" WATER
PROP OFFSITE RUNOFF STORAGE CHAMBERS
PROP INLET
PROP ONSITE RUNOFF STORAGE CHAMBERS
PROP FIRE LINE
PROP C&G
PROP R/W
PROP BUILDING
412,348 SF
1433.0 F.F.
PROP INLET
PROP FIRE LINE
PROP SD
PROP INLET
PROP INLET
EX 18" BRACKISH WATER
PROJECT BOUNDARY
EX 8" WATER
EX TELEPHONE
EX 2" GAS
PROP C&G
EX R/W
PROP PUBLIC SD EASEMENT
PROP R/W
EX PP PIP
PROP CATCH BASIN (TYP)
PROP 36" RCP
EX 8" SEWER
EX 2" GAS
EX PP PIP
EX OVERHEAD UTILITY
EX PP PIP
EX PP PIP
EX PP PIP
EX CL/ CITY BOUNDARY
EX R/W
EX EP
EX PP PIP
TYLER AVENUE
SHERMAN ROAD
TRUMBLE ROAD
ETHANAC ROAD
EX SIGNALIZED INTERSECTION
FUT DWY PER CUP22-05242
FUT R/W PER CUP22-05242
FUT S/W PER CUP22-05242
FUT C&G PER CUP22-05242
FUT DWY PER CUP22-05242
PROP SEWER CONNECTION
PROP FIRE LINE
PROP R/W
PROP C&G
PROJECT BOUNDARY / EX R/W
EX PP TBU
EX PP PIP
EX FH
EX CL
PROP REALIGNED ETHANAC CL
EX R/W
EX PP PIP
EX 15" SEWER
EX 6" GAS
EX 2" GAS
EX CL
EX TELEPHONE
EX 18" BRACKISH WATER
EX 20" WATER
EX PP PIP
EX OVERHEAD UTILITY
EX PP PIP
PROJECT BOUNDARY / EX R/W
FUTURE SIGNALIZED INTERSECTION TO BE INSTALLED BY OTHERS
EX PP PIP

LEGEND

- EXISTING 18" BRACKISH WATER
- EXISTING BRACKISH WATER BLOW OFF VALVE
- EXISTING ELECTRIC
- EXISTING FIRE HYDRANT
- EXISTING 2" GAS
- EXISTING 3" GAS
- EXISTING 6" GAS
- EXISTING OVERHEAD UTILITY
- EXISTING 6" SEWER
- EXISTING 8" SEWER
- EXISTING 15" SEWER
- EXISTING 18" SEWER
- EXISTING SEWER MANHOLE
- EXISTING 36" STORM DRAIN
- EXISTING 48" STORM DRAIN
- EXISTING TELEPHONE
- EXISTING 8" WATER
- EXISTING 12" WATER
- EXISTING 20" WATER
- PROJECT BOUNDARY
- RIGHT-OF-WAY (EXISTING/PROPOSED)
- PROPOSED WATER
- PROPOSED FIRE LINE
- PROPOSED SEWER
- PROPOSED STORM DRAIN

ABBREVIATIONS

CL	CENTER LINE
C&G	CURB AND GUTTER
EX	EXISTING
PP	POWER POLE
PROP	PROPOSED
PIP	PROTECT IN PLACE
RCB	REINFORCED CONCRETE BOX
RCP	REINFORCED CONCRETE PIPE
R/W	RIGHT-OF-WAY
SD	STORM DRAIN
TBU	TO BE UNDERGROUNDED
TYP	TYPICAL

1" = 60'
60 0 60 120 180

N W WEBB E S

REVISIONS	DATE	BY
PUBLIC DETENTION BASIN ADDED	4/23	AG

PRELIMINARY

CITY OF PERRIS

ETHANAC LOGISTICS CENTER
CONCEPTUAL UTILITY
DEVELOPMENT PLAN REVIEW NO. 22-00030

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ALBERT A. WEBB ASSOCIATES
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LEGEND

- EXISTING 18" BRACKISH WATER
- EXISTING BRACKISH WATER BLOW OFF VALVE
- EXISTING ELECTRIC
- EXISTING FIRE HYDRANT
- EXISTING 2" GAS
- EXISTING 3" GAS
- EXISTING 6" GAS
- EXISTING OVERHEAD UTILITY
- EXISTING 6" SEWER
- EXISTING 8" SEWER
- EXISTING 15" SEWER
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ABBREVIATIONS

CL	CENTER LINE
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R/W	RIGHT-OF-WAY
SD	STORM DRAIN
TBU	TO BE UNDERGROUNDED
TYP	TYPICAL

N W WEBB E S

1" = 60'

60 0 60 120 180

PRELIMINARY

REVISIONS	DATE	BY
REFERENCE TO MDP LINE A-11 ADDED	4/23	AG

CITY OF PERRIS

ETHANAC LOGISTICS CENTER
CONCEPTUAL UTILITY
DEVELOPMENT PLAN REVIEW NO. 22-00030

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Preliminary Drainage Analysis (Optional)

Ethanac Logistics Center
DPR22-00030
Perris, California

Preliminary Drainage Study

Prepared for:
Hillwood
901 Via Piemonte Suite 175
Ontario, CA 91764
(909) 256-5924

Prepared By:
ALBERT A. WEBB ASSOCIATES
3788 McCray Street
Riverside, CA 92506

Original Date Prepared: January 2023
Revision Date(s): April 2023, September 2023, December 2023

DRAFT

Sarah Kowalski
Project Engineer

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FIG. 3 AERIAL PHOTOGRAPH
FIG. 4 RECEIVING WATERBODIES
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CITY OF PERRIS LINE A WSPG CALCULATIONS

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PROPOSED CONDITION OFFSITE 100-YEAR, 1-HOUR UNIT HYDROGRAPH
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UNIT HYDROGRAPH HYDROLOGY MAPS

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Romoland Master Drainage Plan
Illinois Avenue Line A Storm Drain Plan P8-921
MDP Line A-11 Storm Drain Plan P8-798
Development Plan Review 22-00030

SECTION 1 - SUMMARY

PURPOSE

The purpose of this report is to document the hydrologic and hydraulic analyses performed in support of the Ethanac Logistics Center project located in City of Perris, County of Riverside, California. The project site is located north of Ethanac Road, bounded by Sherman Road to east, Trumble Road to the west, vacant land and an industrial development to the north. The project applicant proposes to build a commercial/industrial building on approximately 21 gross acres. This report will summarize the hydrologic and hydraulic analyses that were conducted in order to determine the necessary drainage improvements required to provide flood protection for the proposed building and safely convey the runoff through the site.

The scope of this report will include the following:

- Determine the peak 100-year and 10-year flow rates for the developed condition using the Riverside County Flood Control and Water Conservation District (RCFC&WCD) Rational Method.
- Determine the required storm drain facilities, alignment, and sizes required to flood protect the project site.
- Determine the volume required for water quality treatment and to mitigate for increases in runoff.
- Preparation of a preliminary report summarizing the hydrology and hydraulic results.

DESCRIPTION OF WATERSHED

As previously described, the project applicant is proposing a commercial/industrial building (approximately 400,000 square feet) on approximately 21 gross acres of vacant land. Existing elevations across the site vary from 1433 in the southeast corner of the site to 1427.7 in the west end (NAVD88 datum). The site currently slopes down at approximately 1% grade to the west. The existing drainage pattern for the site and the general area is characterized by sheet flows that follow the slope to the west towards Trumble Road. The project site is not located within a specific plan, but it is within the Romoland Master Drainage Plan watershed area.

PROPOSED CONDITIONS

ONSITE

In the proposed condition of Ethanac Logistics Center onsite runoff will be conveyed throughout the site via proposed ribbon gutters and curbs and gutters. Onsite runoff will then be captured by a network of drainage inlets provided at low points. Proposed private underground storm drain Lines 1 and 2 convey captured flows towards underground storage chambers before being pumped to a proposed biotreatment device for water quality treatment. Treated stormwater will then gravity flow to proposed storm drain Line 4 in Trumble Road, that connects to City of Perris Line A (City Line A) in Illinois Avenue per P8-921. City Line A ultimately connects to Romoland MDP Line A-11 (MDP Line A-11), and thence Romoland MDP Line A (MDP Line A). The Ethanac Logistics Center project site is naturally tributary to MDP Line A-11.

This project site is subject to HCOC mitigation. The 2-Year, 24-Hour unit hydrograph storm event was calculated and it was determined that the site would need to mitigate for volume of approximately 93,600 cubic feet. The underground chambers onsite have been sized to accommodate the HCOC volume. In addition to this and the water quality volume, the underground chambers have been sized to accommodate the onsite 100-year storm volume (unit hydrograph calculations provided in Appendix A). The 100-year storm will gravity to the proposed public underground chambers which are further described below and in Section 2.

OFFSITE

Offsite flows from the area east of the project site, as shown on "Offsite Unit Hydrograph Hydrology" Map in Appendix A, currently flow westerly to Sherman Road and across existing ribbon gutters, draining to the Ethanac Logistics Center project site. The proposed project is to be improving Sherman Road, thus storm drain facilities will be required to pick up the storm water. Per the Romoland MDP, this area east of Sherman Road is to be picked up by MDP Line A-1 that is to be located in Sherman Road traveling north from the existing MDP Line A channel located just north of McLaughlin Avenue.

A preliminary profile for MDP Line A-1 was ran from the existing MDP Line A north in Sherman Road to the mid-point of the Ethanac Logistics Center project frontage, utilizing a minimum grade of 0.3% and preliminary MDP facilities sizes ranging from 39" to 72" RCP. This approach showed that once the pipe was to reach Ethanac Road, as a 48" RCP, the cover over the storm drain pipe was approximately one foot. As the pipe extended north of Ethanac Road it was modeled as a 42" RCP and the cover over the facility became non-existent with approximately 1-2' of the 42" RCP above the existing street surface.

In addition to the vertical constraints, existing utilities within the Ethanac Road and Sherman Road intersection, and traveling north in Sherman Road, present several horizontal constraints. Some the existing utilities consist of, but are not limited to, gas lines ranging from 2" to 6", water lines ranging from 8" to 20", sewer lines ranging from 6" to 18", 18" raw water lines, and communications conduit.

Due to the constructability constraints described above, it was decided to collect these offsite flows via proposed catch basins in Sherman Road and convey them in a proposed public storm drain (Line 3, 60" RCP) across the north end of the site. These flows will eventually confluence with the onsite flows in proposed public storm drain Line 4 in Trumble Road. As mentioned earlier in this report, this project proposed to connect to existing City Line A within Illinois Avenue with proposed public Line 4. To maintain the gravity flow, the proposed upstream end of Line 4 at the project site is to be shallow with approximately 2 feet of cover from the future street finished surface. Due to the shallower elevation of the Line 4 pipe, these offsite flows need to be pumped up to Line 4 elevation. Line 3 discharges the offsite Sherman Avenue flows into a public maintained underground storage chamber that is on the west side of the Ethanac Logistics Center project site, in the truck court area. This chamber is sized to hold the 100-year, 3-hour storm peak volume. The flows will then be pumped out of the basin utilizing a 10 CFS pump and will confluence with the treated onsite flows in Line 4. There is also an 18" gravity line that exits near the top of the storage chamber and connects to Line 4. This gravity line outlets 5.5 cfs, acting as an emergency escape for the chamber.

As described in the previous section, Line 4 connects to the existing City Line A in Illinois Avenue. The Illinois Avenue facilities have been confirmed that they can handle the additional flow. City Line A then connects to MDP Line A-11 via 6'x5' RCB under the I-215. Per the "Perris Crossing Temporary Earth Channel, Romoland MDP Line A11 and Laterals" P-397 plans, referenced in Appendix D, this RCB is sized to handle and contribute 280 CFS to MDP Line A-11. The total confluence flows through City Line A in Illinois, including Ethanac Logistics Center flows and offsite flows, is approximately 85 CFS.

METHODOLOGY

HYDROLOGY

Hydrologic calculations were performed in accordance with the RCFC&WCD Hydrology Manual, dated April 1978. The Rational Method was utilized in determining peak flow rates.

The hydrological parameters, including rainfall values and soil types were derived from the RCFC&WCD Hydrology Manual. The isohyetal maps and soil map have been included in Section 2.

Rational Method calculations were performed using a computer program developed by CivilDesign Corporation and Joseph E. Bonadiman and Associates Inc. The computer program is commonly referred

to as CivilD which incorporates the hydrological parameters outlined in the RCFC&WCD Hydrology Manual.

The Rational Method was used to determine the peak flow rates to size and design the drainage facilities need to convey onsite flows through the site to the proposed underground chamber. The flow rates were computed by generating a hydrologic "link-node" model in which the overall area is divided into separate drainage sub-areas, each tributary to a concentration point (node) determined by the proposed layout and grading.

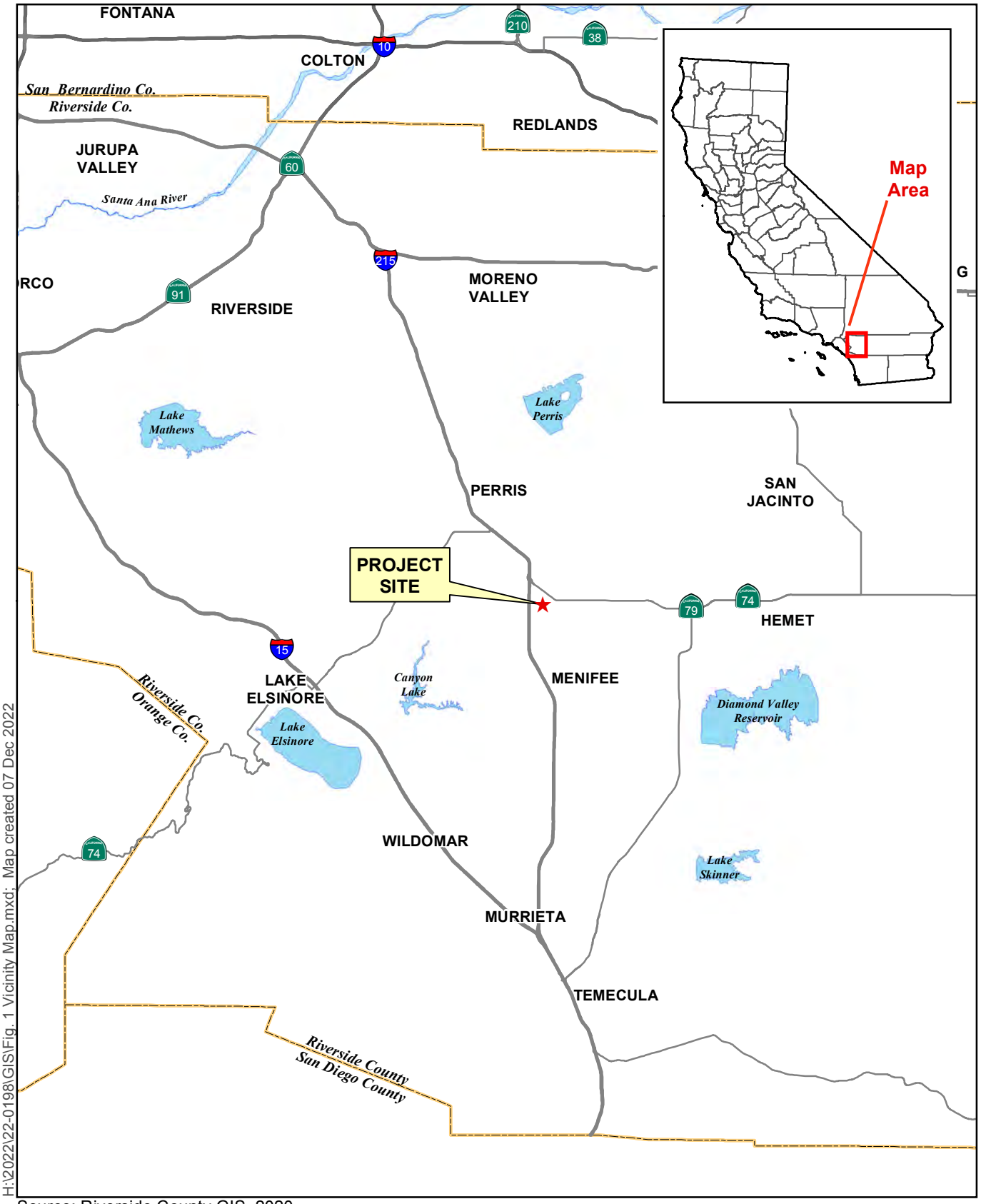
The Unit Hydrograph Method was used to determine the peak flow rates and volumes associated with the 2-year, 24-hour storm events for the site. Calculations were performed for both the existing condition and developed condition to be used in the HCOC mitigation analysis.

HYDRAULICS

Hydraulic calculations to determine the required pipe sizes of proposed storm drain facilities will be provided in the Final Drainage Study.

Preliminary hydraulic calculations to determine capacity of City Line A with added project flows are provided in Appendix B.

FIG. 1 VICINITY MAP
FIG. 2 USGS TOPOGRAPHY MAP
FIG. 3 AERIAL PHOTOGRAPH
FIG. 4 RECEIVING WATERBODIES
FIG. 5 SOILS MAP



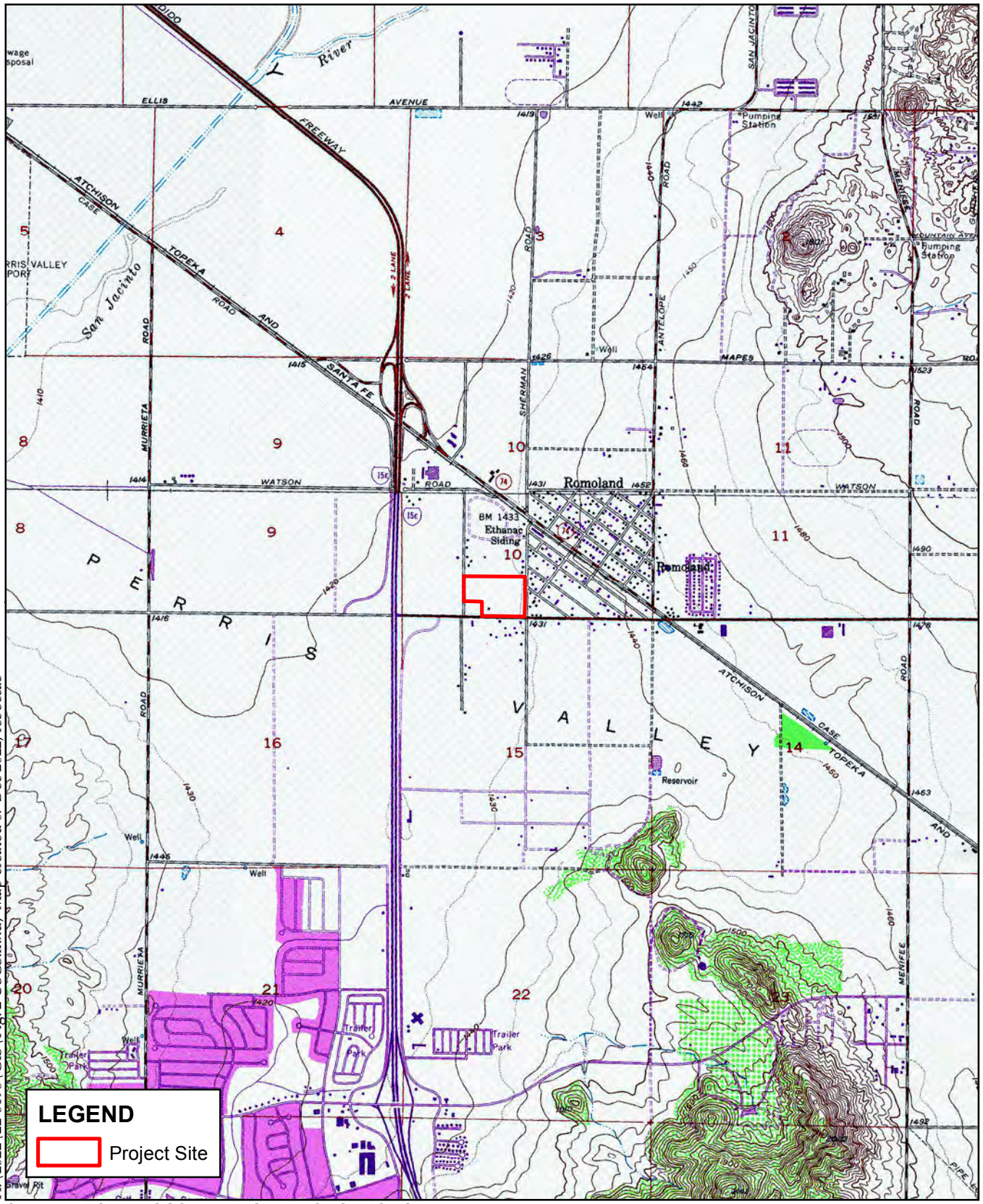
H:\2022\22-0198\GIS\Fig. 1 Vicinity Map.mxd; Map created 07 Dec 2022

Source: Riverside County GIS, 2020

Figure 1 – Vicinity Map

Ethanac Logistics Center

ALBERT A. WEBB ASSOCIATES



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Sources: ESRI / USGS 7.5min Quads: CUCAMONGA PEAK, DEVORE, GUASTI, FONTANA

Figure 2 - USGS Map

Ethanac Logistics Center

ALBERT A. WEBB ASSOCIATES

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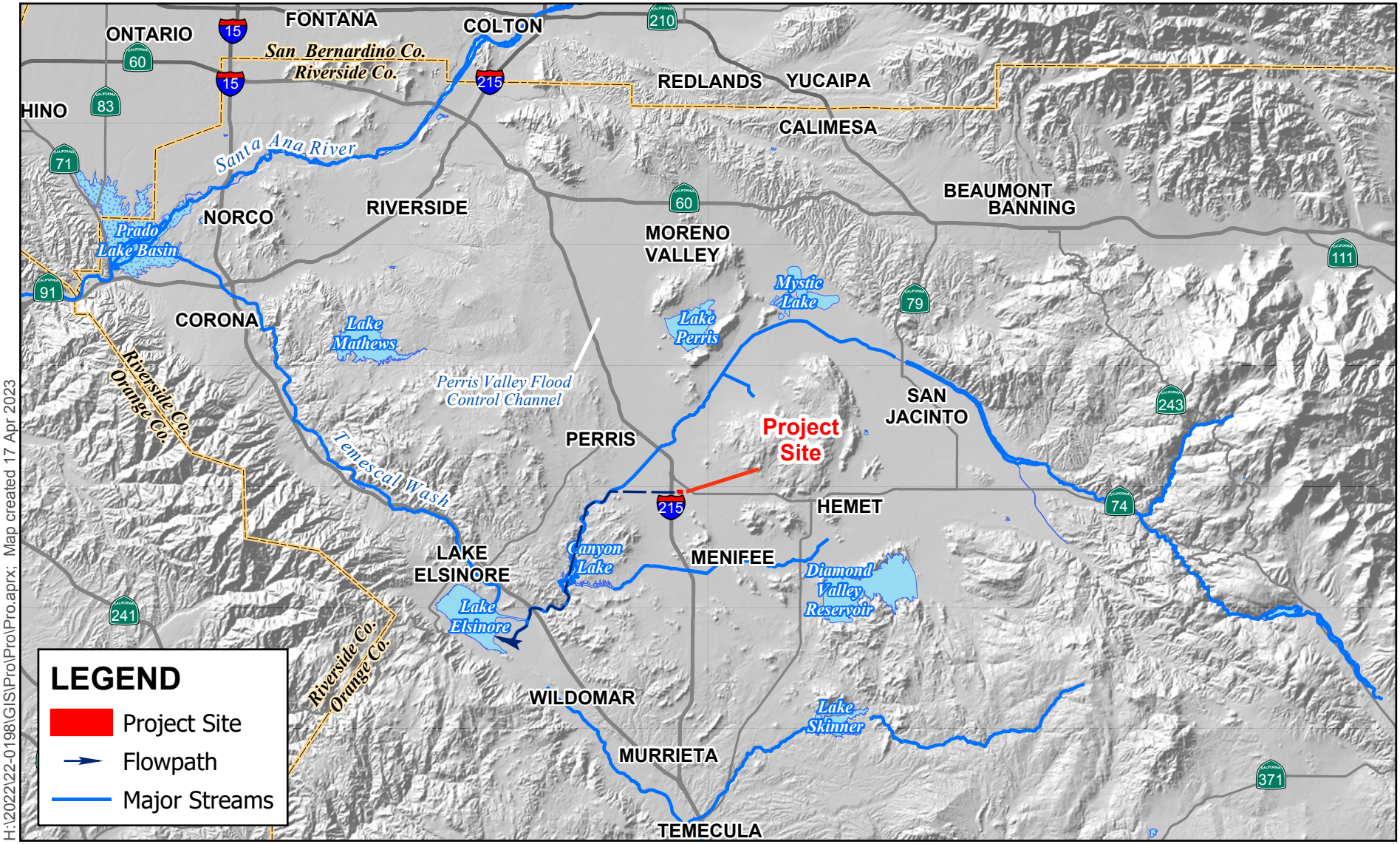
Sources: Riverside Co. GIS, 2022.

0 500 1,000 1,500 Feet

Figure 3 - Aerial Map

Ethanac Logistics Center

ALBERT A. WEBB ASSOCIATES



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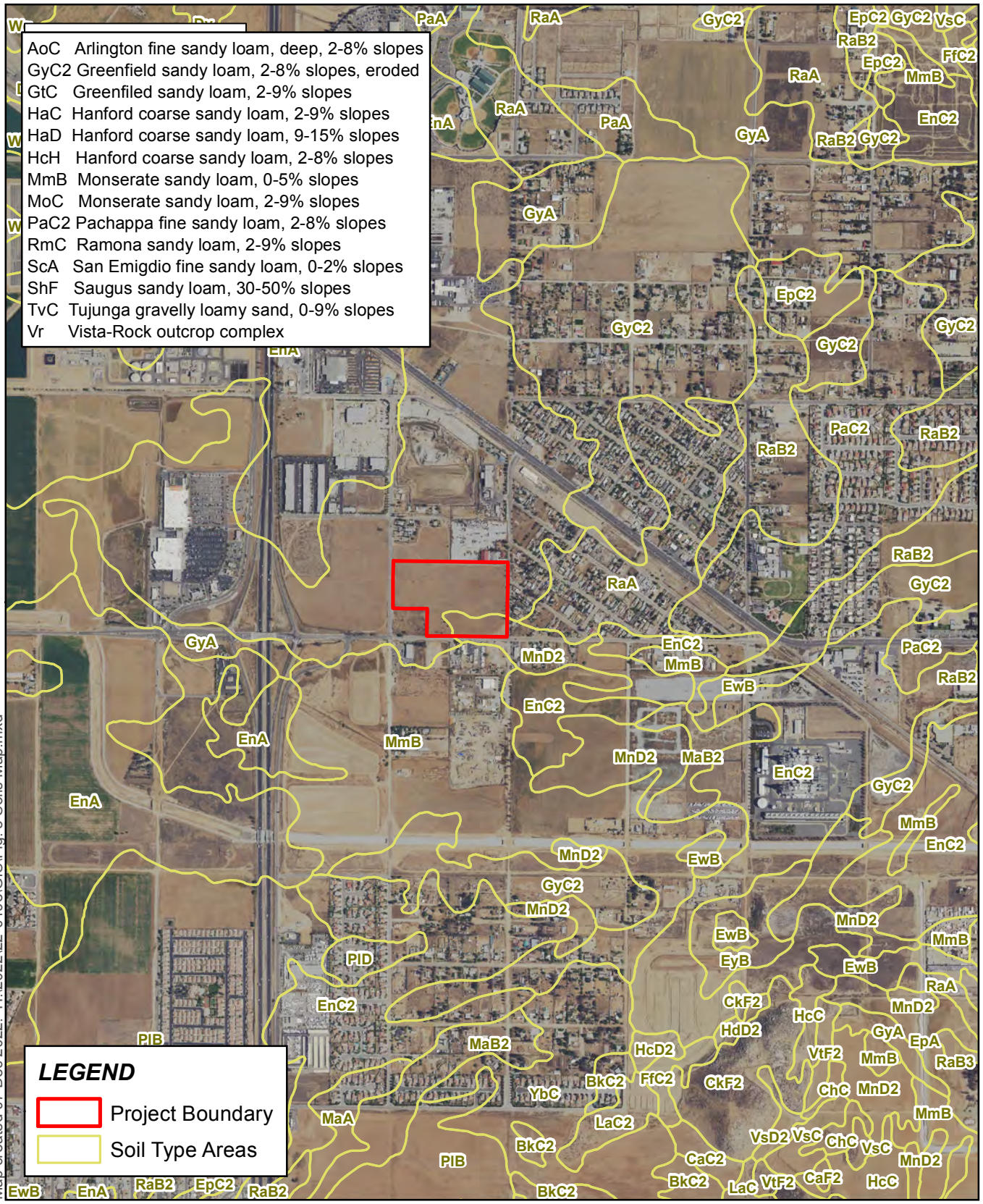
Sources: US NHD; USGS 30 Meter DEM

Figure 4 – Receiving Waterbodies

Ethanac Logistics Center

ALBERT A. WEBB ASSOCIATES



Sources: USDA NRCS SSURGO, 2015;
Riverside Co. GIS, 2020; USDA NAIP, 2016.

0 1,000 2,000 3,000 Feet

Figure 5 – Soils Map

Ethanac Logistics Center

ALBERT A. WEBB ASSOCIATES

SECTION 2 - HYDROLOGY ANALYSIS

HYDROLOGY PARAMETERS

The RCFC&WCD Hydrology Manual was used to determine several of the hydrological parameters. The following rainfall depths were utilized in the hydrology analyses, which were obtained from the isohyetal maps provided in the RCFC&WCD Hydrology Manual:

Table 1 – Precipitation

	Duration	
Storm Event	1-Hour (inches)	24-Hour (inches)
2-Year	0.46	1.6
100-Year	1.24	4.0

The value for slope of intensity was determined to be 0.61. The isohyetal maps have been included in Appendix A.

Based on the Plate C-1.42 - Romoland in the RCFC&WCD Hydrology Manual, the project site is classified as soil type D. The soils map is included in Appendix A.

The cover type was determined based on the existing land cover and proposed land use of the site. Hydrological computations for the existing condition were done using 'Natural Grass'. The Commercial Landscaping cover type was used to represent the developed condition. The table below summarizes the runoff index values and the recommended values for percentage of impervious cover for each category:

Table 2 – Cover Type

Cover Type	Soil Group A	Soil Group B	Soil Group C	Soil Group D	Percentage of Impervious Cover
Existing Condition Natural Grass	67	78	86	89	0.0%
Developed Condition Commercial Landscaping	32	56	69	75	90%

ON-SITE RATIONAL METHOD HYDROLOGY

The rational method was used to determine peak flow rates in order to adequately size the proposed subsurface storm drains and associated inlets used to convey on-site flows to the underground storage chamber.

There are two onsite storm drain systems, Line 1 (200-series nodes) and Line 2 (300-series nodes) that drain into the underground chambers. Line 1 drains from the southwest portion of the building and Line 2 drains from the east side of the building. There are also a few inlets on the west side trailer parking area with short laterals punching directly into the underground chamber. These three areas make up one

DMA for the site. The underground storage chamber is pumped through a treatment box and then leaves the site via proposed storm drain Line 4 in Trumble Road, that connects to City Line A in Illinois Avenue per P8-921. City Line A ultimately connects to MDP Line A-11. The water quality pump is estimated to be 86 GPM; a maximum of 1 CFS of onsite flows will be pumped into Line 4 at a time. Flows in Line 4 will be discussed further below.

The following table summarizes the rational method results at key points:

Table 3 – Onsite Rational Method Results

Point of Interest	10-Year Peak Flow Rate (cfs)	100-Year Peak Flow Rate (cfs)
Node 201 – Line 1 Total Flows	2.7	4.1
Node 306 – Line 2 Total Flows	17.1	25.9
Node 104 – Total Flows for the Site	31.2	47.4

The rational method output files and hydrology map have been included in Appendix A.

OFF-SITE RATIONAL METHOD HYDROLOGY

The rational method was used to determine peak flow rates in order to adequately size the proposed subsurface storm drains and associated inlets used to convey off-site flows to the proposed storm drain connection. As described previously, offsite flows are collected by catch basins in Sherman Road, represented by Node 402 on the Rational Hydrology Map. The peak flow from the offsite area totals 163 CFS, per the 100-year 1-hour unit hydrograph for the offsite area, which is described further in Section 4.

As previously stated in Section 1, these flows were originally planned to go to MDP Line A-1. However, as discussed in Section 1, the construction of Line A-1 has been deemed infeasible. These flows will be conveyed via a 60" RCP, confirmed to handle the peak flow, across the north end of the project site and outlet into the public underground storage chambers on the west side of the project site under the truck court area, at node 403 on the Rational Hydrology Map in Appendix A. This portion of the rational hydrology calculations is shown in "PROP100OFFSITEIN" in Appendix A.

Offsite flows are then pumped out of the storage chamber, via a 10 CFS pump at node 404, into storm drain Line 4 in Trumble Road where they confluence with the onsite flows as they leave the site at node 405. Because these flows (onsite and offsite) that are leaving the site are both pumped flows, they are represented in the CivilD program as user inputs. It is modeled as 10 cfs of offsite flows confluencing with 1 CFS of onsite flows.

Offsite flows from the improved half of Trumble Road are collected by a catch basin at Node 501. These flows confluence with the onsite project flows, and the offsite flows from east of the project, at Nodes 502 and 503. In total, these produce a total confluence flow of 17 cfs, requiring a minimum 24" RCP for Line 4 in Trumble Road.

These combined flows travel through Line 4 north to a point of connection, represented by node 406, in City Line A in Illinois Avenue. The invert elevation at this point of connection is shown on the Line A storm drain plan as approximately 1419.3 (NGVD29) and it is called out as 1421.8 (NAVD88) on the Rational Method Hydrology map. Here the flows confluence with existing flows in City Line A. Sizing

calculations for City Line A can be found in Appendix B and are discussed further in Section 3. This portion of the rational hydrology calculations is shown in "PROP100OFFSITEOUT" in Appendix A.

As discussed in Section 1, City Line A then connects to MDP Line A-11 via 6'x5' RCB under the I-215. Per the "Perris Crossing Temporary Earth Channel, Romoland MDP Line A11 and Laterals" P-397 plans, referenced in Appendix D, this RCB is sized to handle and contribute 280 CFS to MDP Line A-11. The total confluence flows through City Line A in Illinois, including Ethanac Logistics Center flows and offsite flows, is approximately 85 CFS.

The following table summarizes the rational method results at key points:

Table 4 – Offsite Rational Method Results

Point of Interest	10-Year Peak Flow Rate (cfs)	100-Year Peak Flow Rate (cfs)
Node 402 – Line 3 Total Flows (Offsite Tributary Flows)	-	163.0
Node 501 – Trumble Road Half Improvement Flows		2.7
Node 502 – Trumble Road & Public Chamber Pumped Flow Confluenced		12.1
Node 503 – Confluence of Public Chamber Emergency Escape		16.2
Node 405 – Line 4 Total Flows (Onsite and Offsite Tributary Routed, Confluenced Flows)	-	17.0
Node 407 – City Line A Existing Flows	-	8.9
Node 408 – City Line A Total Flows (Line A & Line 4 Confluenced Flows)	-	17*

*The Rational Method confluences the incoming Line 4 flows with the existing upstream flows in City Line A resulting with 17 CFS. The WSPG run in Section 3/Appendix B more accurately includes incoming flows to City Line A from various laterals downstream, resulting in a higher total Q of 85 CFS.

See Appendix A for the output files of the off-site rational method analysis.

See Appendix B for hydraulic calculations regarding sizing of offsite storm drain facilities.

SECTION 3 - HYDRAULIC ANALYSIS

ON-SITE STORM DRAIN FACILITIES

Onsite hydraulic analysis was not taken into consideration for the preliminary drainage.

OFF-SITE STORM DRAIN FACILITIES

Offsite hydraulic analysis was taken into consideration for the preliminary drainage. Due to the nature of adding onsite project flows and offsite tributary flows to the existing City Line A in Illinois Avenue, the capacity of City Line A needed to be evaluated for its ability to handle the additional flows prior to outletting into the MDP Line A-11.

The existing city-maintained Line A in Illinois Avenue consists of 36" RCP at the proposed connection location and 48" RCP downstream, before it outlets at Station 10+00 to a forebay structure which then connects MDP Line A-11 via 6'x5' double RCB, per P8-921, referenced in Appendix D.

The WSPG Program was run for City Line A, simply adding in 17 CFS from Line 4 in Trumble Road. The addition of the proposed Ethanac Logistics Center project flows and the offsite tributary flows would put the existing City Line A under pressure, but it would not cause ponding at the existing catch basins in Illinois Avenue. The WSPG calculations are referenced in Appendix B.

SECTION 4 - BASIN (CHAMBER) ANALYSIS

ON-SITE UNIT HYDROGRAPH METHOD HYDROLOGY

The unit hydrograph method was used to determine the peak flow rates and volumes in order to adequately size the proposed underground chambers to address HCOC mitigation and 100-year storm volume storage. Unit hydrographs were performed for both the existing condition and developed condition. The existing condition is used to establish a baseline for comparative purposes. The developed condition is used for design purposes. The following table summarizes the results of the unit hydrograph analysis:

Table 5 – On-Site Unit Hydrograph Results

	Existing Condition		Proposed Condition	
Storm Event	Volume (Ac-ft)	Peak Flow (cfs)	Volume (Ac-ft)	Peak Flow (cfs)
2-Year, 24-Hour	0.3	0.43	2.2	3.56
100-Year, 24-Hour	-	-	5.6	9.88

The 2-year 24-hour storm unit hydrograph was run to determine the HCOC volume that needed to be accounted for in the onsite underground chambers. HCOC will be discussed further in the PWQMP. The 2-year 24-hour unit hydrograph calculations and exhibit are referenced in Appendix C.

As described in Section 2, the onsite flows drain to the onsite underground chambers where they are held for water quality treatment. There is a separate emergency escape storm drain line that bypasses the treatment box for the larger 100-year 24-hour storm event. This proposed Line 5 connects the onsite underground chambers to the proposed public underground storage chambers that detain offsite flows which is described subsequently.

The 100-year 24-hour storm unit hydrograph was run for the onsite in order to determine the volume needed to be stored in the onsite underground chambers prior to being pumped offsite. The larger storm flows leave the onsite underground chambers via Line 5, which will be 12" RCP. Line 5 was sized to allow 8 CFS of inflow into the basin, which detains offsite flows, and will be discussed further below. The invert of Line 5 as it exits the chamber will be set at the top of the HCOC ponding elevation, making sure only larger storm flows exit through Line 5. This elevation will be determined in final engineering. The 100-year 24-hour unit hydrograph calculations and exhibit are referenced in Appendix C.

OFF-SITE UNIT HYDROGRAPH METHOD HYDROLOGY

The unit hydrograph method was used to determine the peak flow rates and volumes in order to adequately size the proposed public underground storage chambers for the offsite flows as well as a calculated inflow from the underground chambers in case of a larger storm event. Unit hydrographs were performed for the developed condition. The developed condition is used for design purposes. The following table summarizes the results of the unit hydrograph analysis:

Table 6 – Off-Site Unit Hydrograph Results

	Existing Condition		Proposed Condition	
Storm Event	Volume (Ac-ft)	Peak Flow (cfs)	Volume (Ac-ft)	Peak Flow (cfs)
100-Year, 3-Hour	-	-	5.6	163
100-Year, 24-Hour	-	-	12.2	25.9
100-Year, 1-Hour + Base Flow	-	-	5.6	171

The 100-year 3-hour storm unit hydrograph was calculated to determine the peak flow and volume generated by the offsite area east of Sherman Road that would need to be stored in the public underground storage chambers onsite. This storm event's results were used in an initial basin routing exercise in comparison with the 100-year 24-hour results to determine which had a larger impact on the chamber depth and which should be used to conservatively size the public underground storage chambers. The 100-year 3-hour peak flow for the offsite area is 163 CFS and the volume required for the chambers from this storm event is 242,154 CF. Unit hydrograph calculations can be found in Appendix A.

The 100-year 3-hour storm unit hydrograph was then run using a base flow of 8 CFS. This scenario models the offsite flows flowing into the public underground storage chambers plus an 8 CFS inflow into the public chambers from the onsite private chambers. As described in the previous section, this inflow is in case of larger storm events. This unit hydrograph was used to more accurately size the public chambers that detain the offsite flows and is discussed further below. Unit hydrograph calculations can be found in Appendix C.

BASIN ROUTING ANALYSIS

An initial basin routing analysis was completed to compare the difference in water depth that the 100-year 3-hour and 100-year 24-hour storm hydrographs had on the public underground storage chambers. The 100-year 3-hour storm impacted the chamber depth more and was used as the controlling storm for sizing the chambers sufficiently. A subsequent routing analysis was completed using the 100-year 3-hour storm unit hydrograph with base flow of 8 CFS to demonstrate that the public underground storage chambers contain sufficient volume needed to accept the incoming offsite flowrate, respecting a pumped outflow of 10 CFS and an emergency gravity outflow of 5.5 cfs.

Basin routing calculations were conducted for the offsite flows. A stage-storage-discharge table was determined for the proposed public underground storage chambers. The stage-storage-discharge table provides input data at select elevations in the basin which will determine the storage and discharge at each point based on the pump rate.

As mentioned previously, the public underground storage chambers volume was targeted using the 100-year 3-hour peak flow volume. Routing calculations were performed using this storm event with a base flow of 8 CFS to model the inflow of 100-year onsite storm overflow. It was an iterative process to determine that 8 CFS inflow could be sufficiently handled by the proposed basin volume.

The public underground storage chambers bottom elevation is 1413.6 and is are 12 foot high CMP chambers. The pump will kick out a constant 10 CFS and is kicked on at 0.1 foot deep ponding of water. This is reflected in the routing calculations. The gravity emergency escape line is sized to be 18" and will outlet 5.5 cfs from the chambers. This emergency escape is situated at the very top of the chamber so that

it can adequately gravity to Line 4 in Trumble Road. It was determined that with these inflow and outflow parameters, the public underground storage chambers have sufficient capacity for the offsite flows.

The following table presents the results of routing analysis for the 100-year, 3-hour storm event with an 8 CFS base flow to demonstrate that the public underground storage chambers provides the necessary storage volume needed to accept the peak offsite flows and outlet them at a pumped rate of 10 CFS and gravity outflow of 5.5 cfs.

Table 7 – Basin Routing Results

	Existing Condition		Proposed Condition		
Storm Event	Volume (Ac-ft)	Peak Flow (cfs)	Volume (Ac-ft)	Peak Flow (cfs)	Routing Peak Flow (cfs)
100-Year, 3-Hour	-	-	6.2	171	15.5

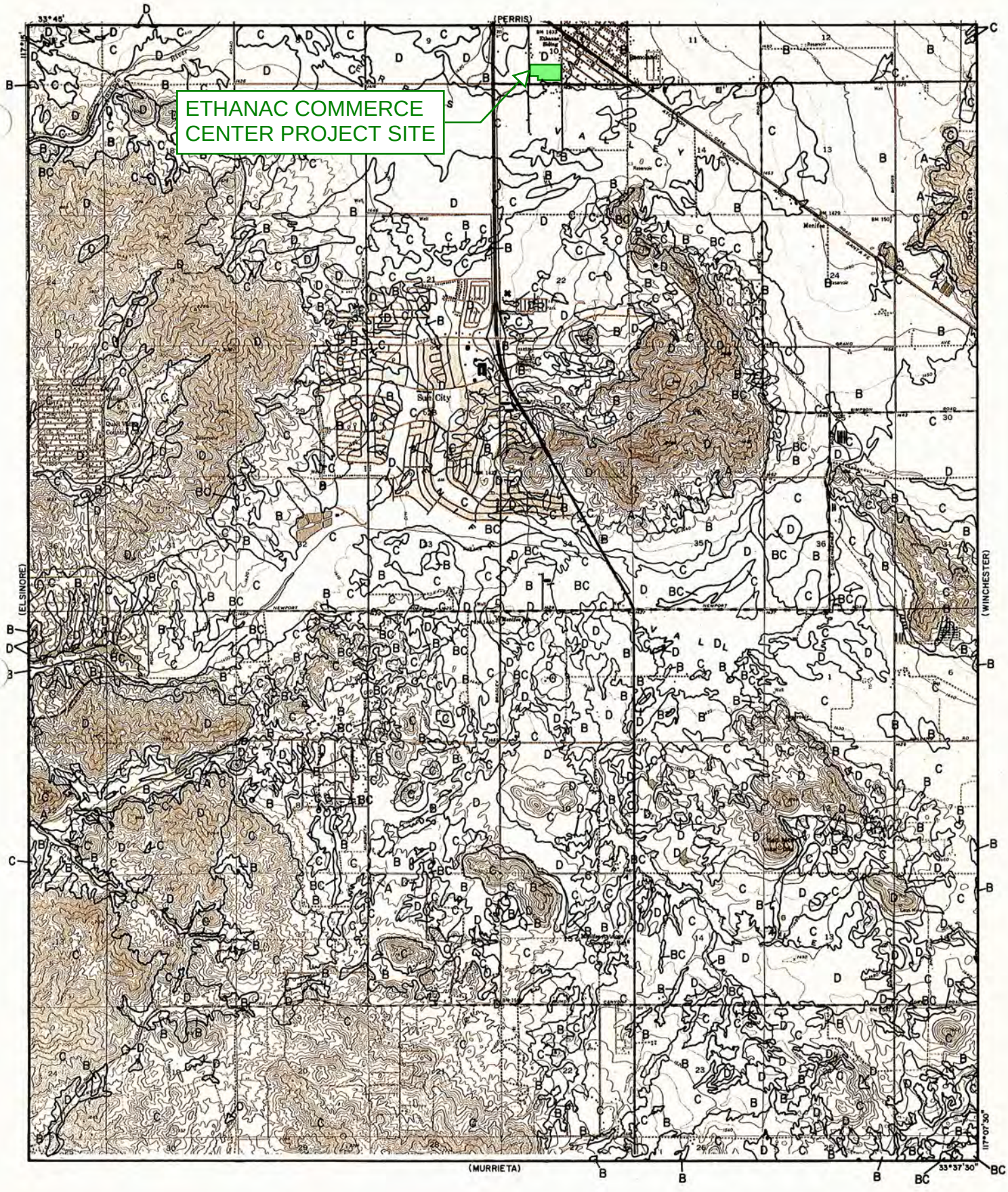
SECTION 5 - CONCLUSION

Based on the analyses and results of this report, the following conclusions were derived from the hydrology and hydraulic results:

- The proposed drainage improvements will adequately convey flows to the underground chamber and provide flood protection for the 100-year storm event.
- The proposed treatment box will provide adequate water quality treatment.
- The proposed public underground storage chambers will adequately accept offsite flows and release at the determined pump rate.
- The proposed project will not impact flooding condition to upstream or downstream properties.

APPENDIX A – HYDROLOGY ANALYSIS

HYDROLOGIC SOILS GROUP MAP (PLATE C-1.42)



LEGEND

——— SOILS GROUP BOUNDARY

A SOILS GROUP DESIGNATION

RCFC & WCD

HYDROLOGY MANUAL

0 FEET 5000

HYDROLOGIC SOILS GROUP MAP FOR ROMOLAND

PLATE C-1.42

ISOHYETAL MAPS

R 07 W | R 06 W | R 05 W | R 04 W | R 03 W | R 02 W | R 01 W | R 01 E | R 02 E | R 03 E | R 04 E | R 05 E

T 01 S
T 02 S
T 03 S
T 04 S
T 05 S
T 06 S
T 07 S
T 08 S

0.85 MiraLoma
0.61 Riverside North
0.68 PigeonPass
0.54 Riverside South
0.66 MorenoEast
0.85 Beaumont
0.88 PradoDam
0.51 Woodcrest
0.50 LakeMathews
0.68 PerrisReservoir
0.87 VistaGrandeGS
0.70 SanJacintoNWS
1.18 Idyllwild
0.58 SunCity
0.68 Winchester
0.70 ElsinoreNWS
1.11 ElCarisoStation
0.90 HurkeyCreek
0.77 WildomarLaCresta
0.52 SkinnerLake
0.65 Anza
0.77 SantaRosaPlateau
1.00 TemeculaNWS
0.64 AguangaValley

Ethanac Commerce Center Project Site

Santa Ana River Watershed
Santa Margarita Watershed

JURUPA VALLEY | EASTVALE | NORCO | CORONA | RIVERSIDE | MORENO VALLEY | CALIMESA | BEAUMONT | SAN JACINTO | PERRIS | CANYON LAKE | LAKE ELSINORE | WILDOMAR | MENIFEE | MURRIETA | HEMET | TEMECULA

06	05	04	03	02	01
07	08	09	10	11	12
18	17	16	15	14	13
19	20	21	22	23	24
30	29	28	27	26	25
31	32	33	34	35	36

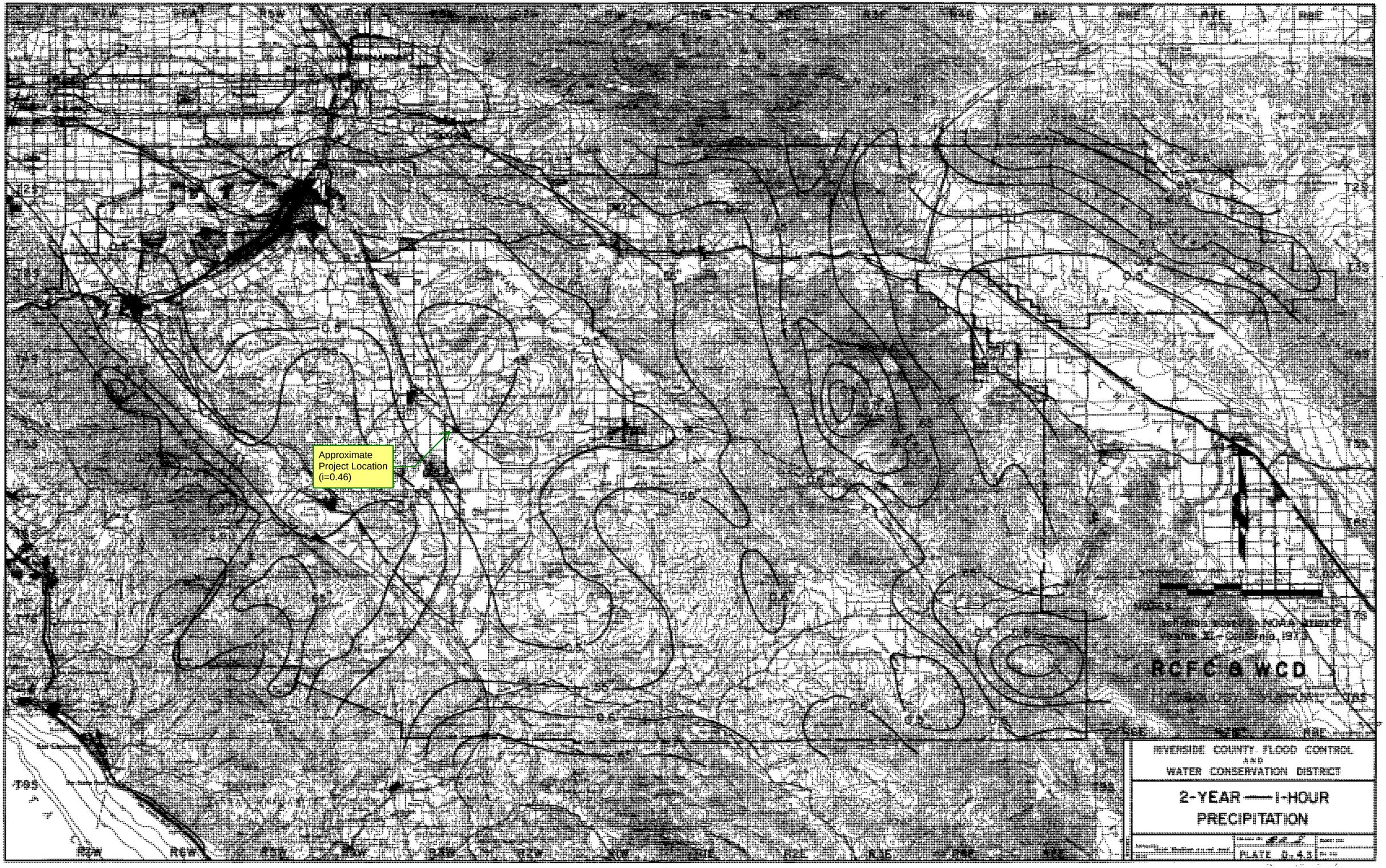
N

Rain Gage Locations

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

Isohyetal Map for the 85th Percentile 24 hour Storm Event

July 2011


Approximate
Project Location
(i=0.46)
NOTES
1. Isohyetals based on NOAA Atlas 2
Volume XI - California, 1973
RCFC & WCD
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
2-YEAR — 1-HOUR
PRECIPITATION
PLATE D-4.5

Approximate Project Location (i=1.6)

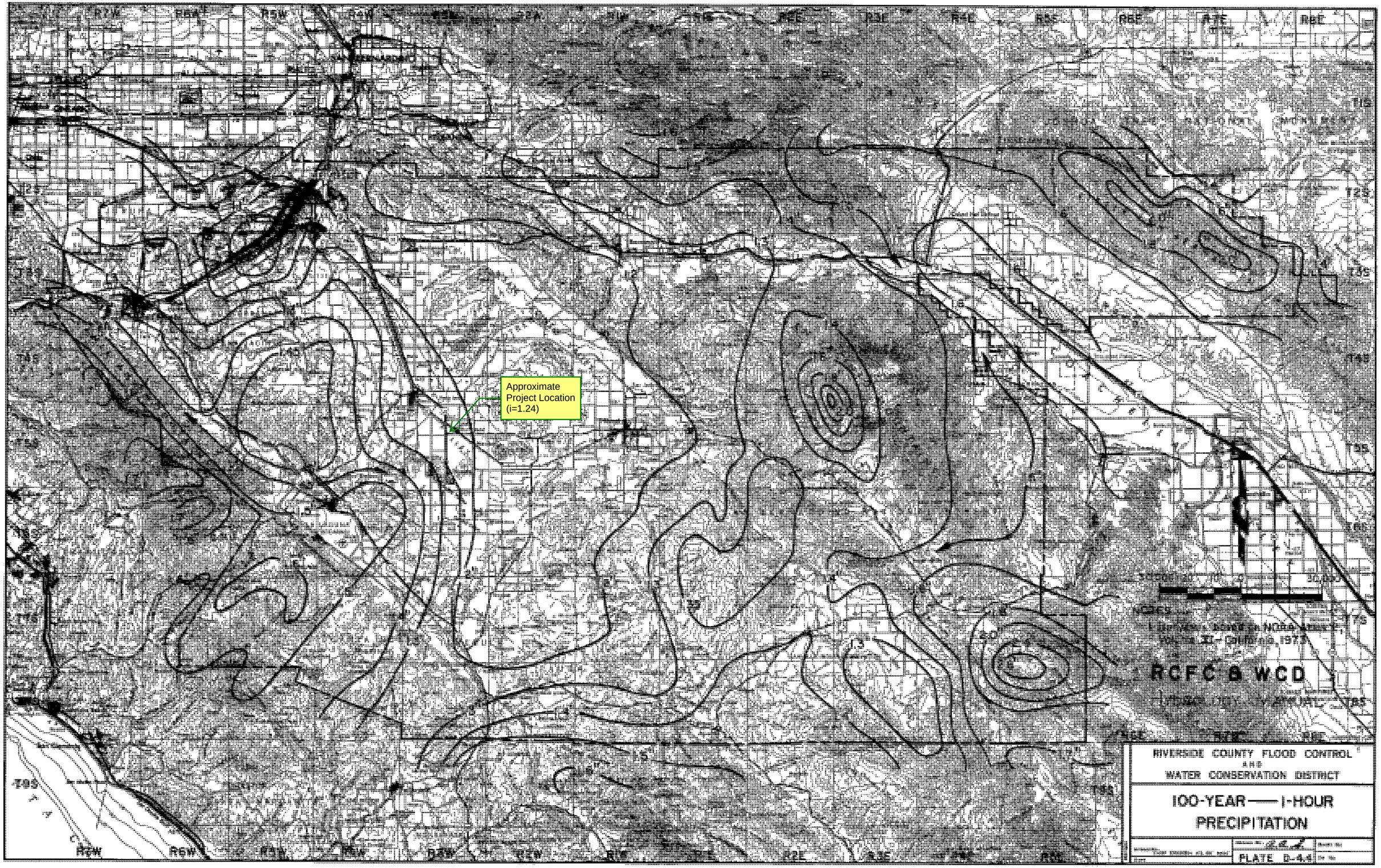
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

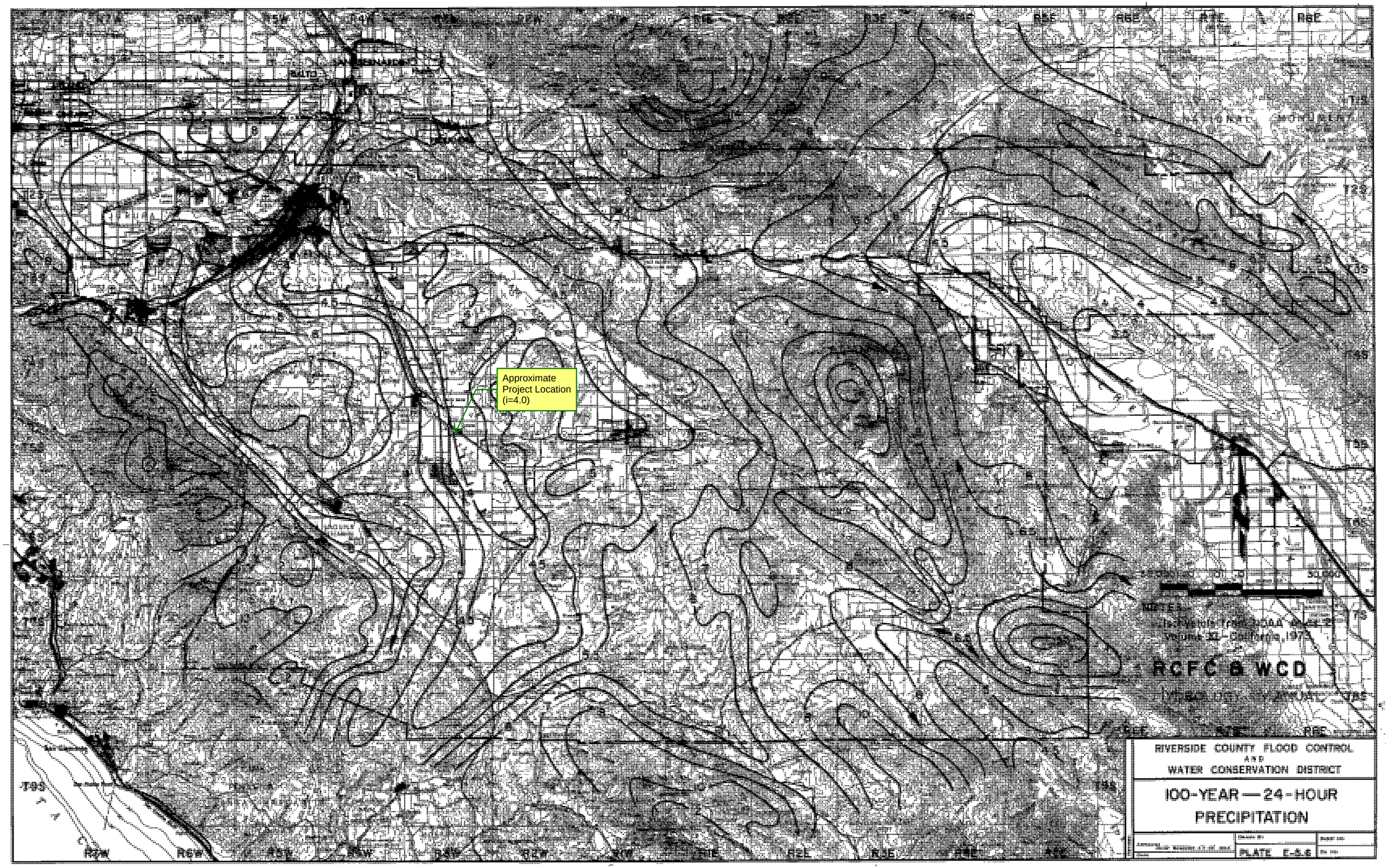
2-YEAR — 24-HOUR PRECIPITATION

PLATE E-5.5

NOAA Atlas 2, Volume XI, California, 1973

RCFC & WCD


Approximate
Project Location
(i=1.24)
RCFC & WCD
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR — 1-HOUR
PRECIPITATION
PLATE D-4.4


Approximate
Project Location
(i=4.0)
RCFC & WCD
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR — 24-HOUR
PRECIPITATION
PLATE E-6.6

RAINFALL INTENSITY–INCHES PER HOUR

DURATION MINUTES	HEMET FREQUENCY 10 YEAR	HEMET FREQUENCY 100 YEAR	DURATION MINUTES	HIGHGROVE FREQUENCY 10 YEAR	HIGHGROVE FREQUENCY 100 YEAR	DURATION MINUTES	HOMELAND – WINCHESTER FREQUENCY 10 YEAR	HOMELAND – WINCHESTER FREQUENCY 100 YEAR	DURATION MINUTES	IDYLLWILD FREQUENCY 10 YEAR	IDYLLWILD FREQUENCY 100 YEAR	DURATION MINUTES	LAKEVIEW FREQUENCY 10 YEAR	LAKEVIEW FREQUENCY 100 YEAR
5	2.84	4.40	5	3.02	4.37	5	2.91	4.37	5	4.91	7.28	5	2.77	4.16
6	2.58	4.00	6	2.75	3.97	6	2.65	3.97	6	4.47	6.62	6	2.53	3.79
7	2.37	3.68	7	2.54	3.67	7	2.44	3.67	7	4.13	6.11	7	2.34	3.51
8	2.21	3.43	8	2.37	3.42	8	2.28	3.42	8	3.85	5.70	8	2.19	3.29
9	2.08	3.23	9	2.23	3.22	9	2.15	3.22	9	3.62	5.36	9	2.07	3.10
10	1.96	3.05	10	2.11	3.05	10	2.03	3.05	10	3.43	5.08	10	1.96	2.94
11	1.87	2.90	11	2.01	2.90	11	1.93	2.90	11	3.26	4.83	11	1.87	2.80
12	1.78	2.77	12	1.92	2.77	12	1.85	2.77	12	3.12	4.62	12	1.79	2.68
13	1.71	2.65	13	1.84	2.66	13	1.77	2.66	13	2.99	4.43	13	1.72	2.58
14	1.64	2.55	14	1.77	2.56	14	1.71	2.56	14	2.88	4.26	14	1.66	2.48
15	1.58	2.46	15	1.71	2.47	15	1.64	2.47	15	2.78	4.11	15	1.60	2.40
16	1.53	2.38	16	1.65	2.39	16	1.59	2.39	16	2.68	3.98	16	1.55	2.32
17	1.48	2.30	17	1.60	2.31	17	1.54	2.31	17	2.60	3.85	17	1.50	2.25
18	1.44	2.23	18	1.55	2.24	18	1.50	2.24	18	2.52	3.74	18	1.46	2.19
19	1.40	2.17	19	1.51	2.18	19	1.45	2.18	19	2.45	3.64	19	1.42	2.13
20	1.36	2.11	20	1.47	2.12	20	1.42	2.12	20	2.39	3.54	20	1.39	2.08
22	1.29	2.01	22	1.40	2.02	22	1.35	2.02	22	2.27	3.37	22	1.32	1.98
24	1.24	1.92	24	1.34	1.93	24	1.29	1.93	24	2.17	3.22	24	1.26	1.90
26	1.18	1.84	26	1.28	1.85	26	1.24	1.85	26	2.09	3.09	26	1.22	1.82
28	1.14	1.77	28	1.23	1.78	28	1.19	1.78	28	2.01	2.97	28	1.17	1.76
30	1.10	1.70	30	1.19	1.72	30	1.15	1.72	30	1.94	2.87	30	1.13	1.70
32	1.06	1.65	32	1.15	1.66	32	1.11	1.66	32	1.87	2.77	32	1.10	1.64
34	1.03	1.59	34	1.12	1.61	34	1.07	1.61	34	1.81	2.69	34	1.06	1.59
36	1.00	1.55	36	1.08	1.57	36	1.04	1.57	36	1.76	2.61	36	1.03	1.55
38	.97	1.50	38	1.05	1.52	38	1.01	1.52	38	1.71	2.54	38	1.01	1.51
40	.94	1.46	40	1.02	1.48	40	.99	1.48	40	1.67	2.47	40	.98	1.47
45	.89	1.37	45	.96	1.39	45	.93	1.39	45	1.57	2.32	45	.92	1.39
50	.84	1.30	50	.91	1.32	50	.88	1.32	50	1.48	2.20	50	.88	1.31
55	.80	1.24	55	.87	1.26	55	.84	1.26	55	1.41	2.09	55	.84	1.25
60	.76	1.18	60	.83	1.20	60	.80	1.20	60	1.35	2.00	60	.80	1.20
65	.73	1.13	65	.80	1.15	65	.77	1.15	65	1.29	1.92	65	.77	1.15
70	.70	1.09	70	.77	1.11	70	.74	1.11	70	1.25	1.85	70	.74	1.11
75	.68	1.05	75	.74	1.07	75	.71	1.07	75	1.20	1.78	75	.72	1.07
80	.65	1.01	80	.71	1.03	80	.69	1.03	80	1.16	1.72	80	.69	1.04
85	.63	.98	85	.69	1.00	85	.67	1.00	85	1.13	1.67	85	.67	1.01
SLOPE =	.530		SLOPE =	.520		SLOPE =	.520		SLOPE =	.520		SLOPE =	.500	

RCFC & WCD

HYDROLOGY MANUAL

STANDARD INTENSITY–DURATION CURVES DATA

PLATE D-4.1 (3 of 6)

10-YEAR ONSITE HYDROLOGY (RATIONAL METHOD)

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2004 Version 7.0
Rational Hydrology Study Date: 12/15/22
File:PROP10ONSITE.out

22-0198 - ETHANAC COMMERCE CENTER
ONSITE RATIONAL METHOD HYDROLOGY
10 YEAR STORM EVENT
FN: PROP10.OUT RSB

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 4010

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 10.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Homeland-Winchester] area used.
10 year storm 10 minute intensity = 2.030(In/Hr)
10 year storm 60 minute intensity = 0.800(In/Hr)
100 year storm 10 minute intensity = 3.050(In/Hr)
100 year storm 60 minute intensity = 1.200(In/Hr)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.800(In/Hr)
Slope of intensity duration curve = 0.5200

++

Process from Point/Station 100.000 to Point/Station 101.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 720.000(Ft.)
Top (of initial area) elevation = 1433.000(Ft.)

```
Bottom (of initial area) elevation =  1426.900(Ft.)
Difference in elevation =     6.100(Ft.)
Slope =    0.00847  s(percent)=       0.85
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.826 min.
Rainfall intensity =      1.949(In/Hr) for a    10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.883
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      7.919(CFS)
Total initial stream area =        4.600(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      101.000 to Point/Station      102.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1423.900(Ft.)
Downstream point/station elevation =  1423.400(Ft.)
Pipe length  =   170.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.919(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =     7.919(CFS)
Normal flow depth in pipe =   15.89(In.)
Flow top width inside pipe =   18.02(In.)
Critical Depth =   12.52(In.)
Pipe flow velocity =      4.05(Ft/s)
Travel time through pipe =    0.70 min.
Time of concentration (TC) =    11.52 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      102.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Runoff Coefficient = 0.883
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =    11.52 min.
```

```
Rainfall intensity =      1.887(In/Hr) for a    10.0 year storm
Subarea runoff =      6.163(CFS) for      3.700(Ac.)
Total runoff =     14.082(CFS)  Total area =       8.300(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      104.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1423.400(Ft.)
Downstream point/station elevation =  1417.500(Ft.)
Pipe length  =   149.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    14.082(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    14.082(CFS)
Normal flow depth in pipe =   10.82(In.)
Flow top width inside pipe =   17.63(In.)
Critical Depth =   16.61(In.)
Pipe flow velocity =     12.69(Ft/s)
Travel time through pipe =    0.20 min.
Time of concentration (TC) =    11.72 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      104.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      8.300(Ac.)
Runoff from this stream =     14.082(CFS)
Time of concentration =   11.72 min.
Rainfall intensity =     1.870(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      200.000 to Point/Station      201.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   356.000(Ft.)
Top (of initial area) elevation =  1434.100(Ft.)
Bottom (of initial area) elevation =  1429.500(Ft.)
Difference in elevation =     4.600(Ft.)
Slope =    0.01292  s(percent)=       1.29
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.507 min.
Rainfall intensity =      2.358(In/Hr) for a    10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.886
```

```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      2.715(CFS)
Total initial stream area =        1.300(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      201.000 to Point/Station      104.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1426.500(Ft.)
Downstream point/station elevation =  1417.500(Ft.)
Pipe length  =   798.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.715(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     2.715(CFS)
Normal flow depth in pipe =    7.52(In.)
Flow top width inside pipe =   11.61(In.)
Critical Depth =    8.48(In.)
Pipe flow velocity =      5.24(Ft/s)
Travel time through pipe =    2.54 min.
Time of concentration (TC) =    10.04 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      201.000 to Point/Station      104.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      1.300(Ac.)
Runoff from this stream =      2.715(CFS)
Time of concentration =   10.04 min.
Rainfall intensity =     2.026(In/Hr)
Program is now starting with Main Stream No. 3


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      300.000 to Point/Station      301.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   556.000(Ft.)
Top (of initial area) elevation =  1434.100(Ft.)
Bottom (of initial area) elevation =  1427.300(Ft.)
Difference in elevation =     6.800(Ft.)
```

```
Slope =    0.01223  s(percent)=       1.22
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.071 min.
Rainfall intensity =      2.137(In/Hr) for a    10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.885
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      6.993(CFS)
Total initial stream area =        3.700(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      301.000 to Point/Station      302.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1424.300(Ft.)
Downstream point/station elevation =  1423.900(Ft.)
Pipe length  =   143.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     6.993(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =     6.993(CFS)
Normal flow depth in pipe =   14.67(In.)
Flow top width inside pipe =   19.27(In.)
Critical Depth =   11.73(In.)
Pipe flow velocity =      3.90(Ft/s)
Travel time through pipe =    0.61 min.
Time of concentration (TC) =     9.68 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      303.000 to Point/Station      302.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Runoff Coefficient = 0.884
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =     9.68 min.
Rainfall intensity =      2.065(In/Hr) for a    10.0 year storm
Subarea runoff =      3.469(CFS) for      1.900(Ac.)
```

```
Total runoff =     10.462(CFS)  Total area =       5.600(Ac.)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Process from Point/Station      302.000 to Point/Station      304.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1423.900(Ft.)
Downstream point/station elevation =  1423.400(Ft.)
Pipe length  =   143.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    10.462(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    10.462(CFS)
Normal flow depth in pipe =   15.98(In.)
Flow top width inside pipe =   22.64(In.)
Critical Depth =   13.89(In.)
Pipe flow velocity =      4.71(Ft/s)
Travel time through pipe =    0.51 min.
Time of concentration (TC) =    10.19 min.


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Process from Point/Station      305.000 to Point/Station      304.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
COMMERCIAL subarea type
Runoff Coefficient = 0.884
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =    10.19 min.
Rainfall intensity =      2.011(In/Hr) for a    10.0 year storm
Subarea runoff =      3.200(CFS) for      1.800(Ac.)
Total runoff =     13.662(CFS)  Total area =       7.400(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      304.000 to Point/Station      306.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1423.400(Ft.)
Downstream point/station elevation =  1423.000(Ft.)
Pipe length  =   143.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    13.662(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    13.662(CFS)
Normal flow depth in pipe =   18.84(In.)
```

```
Flow top width inside pipe =   24.79(In.)
Critical Depth =   15.42(In.)
Pipe flow velocity =      4.61(Ft/s)
Travel time through pipe =    0.52 min.
Time of concentration (TC) =    10.71 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      307.000 to Point/Station      306.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Runoff Coefficient = 0.883
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =    10.71 min.
Rainfall intensity =      1.960(In/Hr) for a    10.0 year storm
Subarea runoff =      3.463(CFS) for      2.000(Ac.)
Total runoff =     17.125(CFS)  Total area =       9.400(Ac.)


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Process from Point/Station      306.000 to Point/Station      104.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1423.000(Ft.)
Downstream point/station elevation =  1417.500(Ft.)
Pipe length  =   998.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    17.125(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    17.125(CFS)
Normal flow depth in pipe =   20.11(In.)
Flow top width inside pipe =   17.69(In.)
Critical Depth =   17.91(In.)
Pipe flow velocity =      6.09(Ft/s)
Travel time through pipe =    2.73 min.
Time of concentration (TC) =    13.44 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      306.000 to Point/Station      104.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =      9.400(Ac.)
```

```
Runoff from this stream =     17.125(CFS)
Time of concentration =   13.44 min.
Rainfall intensity =     1.742(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       14.082     11.72                 1.870
2        2.715     10.04                 2.026
3       17.125     13.44                 1.742
Largest stream flow has longer time of concentration
Qp =     17.125 + sum of
          Qb         Ia/Ib
          14.082 *    0.931 =     13.115
          Qb         Ia/Ib
           2.715 *    0.860 =      2.334
Qp =     32.574

Total of 3 main streams to confluence:
Flow rates before confluence point:
      14.082       2.715      17.125
Area of streams before confluence:
        8.300        1.300        9.400


Results of confluence:
Total flow rate =     32.574(CFS)
Time of concentration =    13.437 min.
Effective stream area after confluence  =     19.000(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      104.000 to Point/Station      105.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1417.500(Ft.)
Downstream point/station elevation =  1417.400(Ft.)
Pipe length  =    28.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    32.574(CFS)
Nearest computed pipe diameter  =     33.00(In.)
Calculated individual pipe flow  =    32.574(CFS)
Normal flow depth in pipe =   28.03(In.)
Flow top width inside pipe =   23.60(In.)
Critical Depth =   22.79(In.)
Pipe flow velocity =      6.05(Ft/s)
Travel time through pipe =    0.08 min.
Time of concentration (TC) =    13.51 min.
End of computations, total study area =           19.00 (Ac.)
```

The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number = 75.0

100-YEAR ONSITE HYDROLOGY (RATIONAL METHOD)

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2004 Version 7.0
Rational Hydrology Study Date: 12/15/22
File:PROP100ONSITE.out

22-0198 - ETHANAC COMMERCE CENTER
ONSITE RATIONAL METHOD HYDROLOGY
100 YEAR STORM EVENT
FN: PROP100.OUT RSB

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 4010

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Homeland-Winchester] area used.
10 year storm 10 minute intensity = 2.030(In/Hr)
10 year storm 60 minute intensity = 0.800(In/Hr)
100 year storm 10 minute intensity = 3.050(In/Hr)
100 year storm 60 minute intensity = 1.200(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.200(In/Hr)
Slope of intensity duration curve = 0.5200

++

Process from Point/Station 100.000 to Point/Station 101.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 720.000(Ft.)
Top (of initial area) elevation = 1433.000(Ft.)

```
Bottom (of initial area) elevation =  1426.900(Ft.)
Difference in elevation =     6.100(Ft.)
Slope =    0.00847  s(percent)=       0.85
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   10.826 min.
Rainfall intensity =      2.924(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.888
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =     11.944(CFS)
Total initial stream area =        4.600(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      101.000 to Point/Station      102.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1423.900(Ft.)
Downstream point/station elevation =  1423.400(Ft.)
Pipe length  =   170.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    11.944(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    11.944(CFS)
Normal flow depth in pipe =   19.13(In.)
Flow top width inside pipe =   19.31(In.)
Critical Depth =   14.91(In.)
Pipe flow velocity =      4.45(Ft/s)
Travel time through pipe =    0.64 min.
Time of concentration (TC) =    11.46 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      103.000 to Point/Station      102.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Runoff Coefficient = 0.888
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =    11.46 min.
```

```
Rainfall intensity =      2.838(In/Hr) for a   100.0 year storm
Subarea runoff =      9.322(CFS) for      3.700(Ac.)
Total runoff =     21.266(CFS)  Total area =       8.300(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      104.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1423.400(Ft.)
Downstream point/station elevation =  1417.500(Ft.)
Pipe length  =   149.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    21.266(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    21.266(CFS)
Normal flow depth in pipe =   12.63(In.)
Flow top width inside pipe =   20.56(In.)
Critical Depth =   19.51(In.)
Pipe flow velocity =     14.07(Ft/s)
Travel time through pipe =    0.18 min.
Time of concentration (TC) =    11.64 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      104.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      8.300(Ac.)
Runoff from this stream =     21.266(CFS)
Time of concentration =   11.64 min.
Rainfall intensity =     2.815(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      200.000 to Point/Station      201.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   356.000(Ft.)
Top (of initial area) elevation =  1434.100(Ft.)
Bottom (of initial area) elevation =  1429.500(Ft.)
Difference in elevation =     4.600(Ft.)
Slope =    0.01292  s(percent)=       1.29
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.507 min.
Rainfall intensity =      3.537(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.890
```

```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      4.092(CFS)
Total initial stream area =        1.300(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      201.000 to Point/Station      104.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1426.500(Ft.)
Downstream point/station elevation =  1417.500(Ft.)
Pipe length  =   798.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     4.092(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     4.092(CFS)
Normal flow depth in pipe =    8.34(In.)
Flow top width inside pipe =   14.90(In.)
Critical Depth =    9.83(In.)
Pipe flow velocity =      5.84(Ft/s)
Travel time through pipe =    2.28 min.
Time of concentration (TC) =     9.79 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      201.000 to Point/Station      104.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      1.300(Ac.)
Runoff from this stream =      4.092(CFS)
Time of concentration =    9.79 min.
Rainfall intensity =     3.081(In/Hr)
Program is now starting with Main Stream No. 3


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      300.000 to Point/Station      301.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   556.000(Ft.)
Top (of initial area) elevation =  1434.100(Ft.)
Bottom (of initial area) elevation =  1427.300(Ft.)
Difference in elevation =     6.800(Ft.)
```

```
Slope =    0.01223  s(percent)=       1.22
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.071 min.
Rainfall intensity =      3.205(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.889
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =     10.543(CFS)
Total initial stream area =        3.700(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      301.000 to Point/Station      302.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1424.300(Ft.)
Downstream point/station elevation =  1423.900(Ft.)
Pipe length  =   143.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    10.543(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    10.543(CFS)
Normal flow depth in pipe =   17.48(In.)
Flow top width inside pipe =   21.35(In.)
Critical Depth =   13.97(In.)
Pipe flow velocity =      4.30(Ft/s)
Travel time through pipe =    0.55 min.
Time of concentration (TC) =     9.63 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      303.000 to Point/Station      302.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Runoff Coefficient = 0.889
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =     9.63 min.
Rainfall intensity =      3.108(In/Hr) for a   100.0 year storm
Subarea runoff =      5.248(CFS) for      1.900(Ac.)
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Total runoff =     15.790(CFS)  Total area =       5.600(Ac.)


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Process from Point/Station      302.000 to Point/Station      304.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1423.900(Ft.)
Downstream point/station elevation =  1423.400(Ft.)
Pipe length  =   143.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    15.790(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    15.790(CFS)
Normal flow depth in pipe =   19.34(In.)
Flow top width inside pipe =   24.35(In.)
Critical Depth =   16.62(In.)
Pipe flow velocity =      5.18(Ft/s)
Travel time through pipe =    0.46 min.
Time of concentration (TC) =    10.09 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      305.000 to Point/Station      304.000
**** SUBAREA FLOW ADDITION ****
______________________________________________________________________________
COMMERCIAL subarea type
Runoff Coefficient = 0.888
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =    10.09 min.
Rainfall intensity =      3.033(In/Hr) for a   100.0 year storm
Subarea runoff =      4.851(CFS) for      1.800(Ac.)
Total runoff =     20.641(CFS)  Total area =       7.400(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      304.000 to Point/Station      306.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1423.400(Ft.)
Downstream point/station elevation =  1423.000(Ft.)
Pipe length  =   143.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    20.641(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    20.641(CFS)
Normal flow depth in pipe =   23.39(In.)
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```
Flow top width inside pipe =   24.87(In.)
Critical Depth =   18.52(In.)
Pipe flow velocity =      5.03(Ft/s)
Travel time through pipe =    0.47 min.
Time of concentration (TC) =    10.56 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      307.000 to Point/Station      306.000
**** SUBAREA FLOW ADDITION ****
________________________________________________________________________
COMMERCIAL subarea type
Runoff Coefficient = 0.888
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Time of concentration =    10.56 min.
Rainfall intensity =      2.962(In/Hr) for a   100.0 year storm
Subarea runoff =      5.261(CFS) for      2.000(Ac.)
Total runoff =     25.903(CFS)  Total area =       9.400(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      306.000 to Point/Station      104.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1423.000(Ft.)
Downstream point/station elevation =  1417.500(Ft.)
Pipe length  =   998.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    25.903(CFS)
Nearest computed pipe diameter  =     30.00(In.)
Calculated individual pipe flow  =    25.903(CFS)
Normal flow depth in pipe =   21.26(In.)
Flow top width inside pipe =   27.26(In.)
Critical Depth =   20.81(In.)
Pipe flow velocity =      6.96(Ft/s)
Travel time through pipe =    2.39 min.
Time of concentration (TC) =    12.95 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      306.000 to Point/Station      104.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =      9.400(Ac.)
```

```
Runoff from this stream =     25.903(CFS)
Time of concentration =   12.95 min.
Rainfall intensity =     2.664(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       21.266     11.64                 2.815
2        4.092      9.79                 3.081
3       25.903     12.95                 2.664
Largest stream flow has longer time of concentration
Qp =     25.903 + sum of
          Qb         Ia/Ib
          21.266 *    0.946 =     20.119
          Qb         Ia/Ib
           4.092 *    0.864 =      3.537
Qp =     49.559

Total of 3 main streams to confluence:
Flow rates before confluence point:
      21.266       4.092      25.903
Area of streams before confluence:
        8.300        1.300        9.400


Results of confluence:
Total flow rate =     49.559(CFS)
Time of concentration =    12.948 min.
Effective stream area after confluence  =     19.000(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      104.000 to Point/Station      105.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1417.500(Ft.)
Downstream point/station elevation =  1417.400(Ft.)
Pipe length  =    28.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    49.559(CFS)
Nearest computed pipe diameter  =     39.00(In.)
Calculated individual pipe flow  =    49.559(CFS)
Normal flow depth in pipe =   32.16(In.)
Flow top width inside pipe =   29.67(In.)
Critical Depth =   26.96(In.)
Pipe flow velocity =      6.78(Ft/s)
Travel time through pipe =    0.07 min.
Time of concentration (TC) =    13.02 min.
End of computations, total study area =           19.00 (Ac.)
```

The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number = 75.0

100-YEAR OFFSITE HYDROLOGY (RATIONAL METHOD)

100-Year Offsite Flows To Basin

```
                    Riverside County Rational Hydrology Program

         CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2004 Version 7.0
                 Rational Hydrology Study        Date: 04/12/23
File:PROP100OFFSITEIN.out
         ---------------------------------------------------------------------------
         22-0198 - ETHANAC COMMERCE CENTER
         OFFSITE RATIONAL METHOD HYDROLOGY
         100 YEAR STORM EVENT - RUNON INTO BASIN
         FN: PROP100.OUT RSB
         ---------------------------------------------------------------------------
          *********   Hydrology Study Control Information **********

          English (in-lb) Units used in input data file

         ---------------------------------------------------------------------------


         Program License Serial Number 4010

         ---------------------------------------------------------------------------
         Rational Method Hydrology Program based on
         Riverside County Flood Control & Water Conservation District
         1978 hydrology manual

         Storm event (year) =  100.00 Antecedent Moisture Condition = 2

         Standard intensity-duration curves data (Plate D-4.1)
         For the [ Homeland-Winchester ] area used.
         10 year storm 10 minute intensity =  2.030(In/Hr)
         10 year storm 60 minute intensity =  0.800(In/Hr)
         100 year storm 10 minute intensity =  3.050(In/Hr)
         100 year storm 60 minute intensity =  1.200(In/Hr)

         Storm event year = 100.0
         Calculated rainfall intensity data:
         1 hour intensity =  1.200(In/Hr)
         Slope of intensity duration curve = 0.5200




         ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
         Process from Point/Station      401.000 to Point/Station      402.000
         **** USER DEFINED FLOW INFORMATION AT A POINT ****
         ------------------------------------------------------------------------
         Rainfall intensity =      2.025(In/Hr) for a   100.0 year storm
         SINGLE FAMILY (1/4 Acre Lot)
```

```
Runoff Coefficient = 0.819
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
User specified values are as follows:
TC =  21.94 min.  Rain intensity =       2.02(In/Hr)
Total area =        64.60(Ac.)  Total runoff =    163.00(CFS)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      402.000 to Point/Station      403.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1424.500(Ft.)
Downstream point/station elevation =  1413.900(Ft.)
Pipe length  =  1753.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =   163.000(CFS)
Nearest computed pipe diameter  =     54.00(In.)
Calculated individual pipe flow  =   163.000(CFS)
Normal flow depth in pipe =   48.60(In.)
Flow top width inside pipe =   32.40(In.)
Critical Depth =   44.76(In.)
Pipe flow velocity =     10.81(Ft/s)
Travel time through pipe =    2.70 min.
Time of concentration (TC) =    24.64 min.
End of computations, total study area =           64.60 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.500
Area averaged RI index number =  75.0
```

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2004 Version 7.0
Rational Hydrology Study Date: 09/01/23
File:PROP100TRUMBLE.out

22-0198 - ETHANAC COMMERCE CENTER
OFFSITE TRUMBLE RATIONAL METHOD HYDROLOGY
100 YEAR STORM EVENT
FN: PROP100TRUMBLE.OUT RSB

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 4010

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Homeland-Winchester] area used.
10 year storm 10 minute intensity = 2.030(In/Hr)
10 year storm 60 minute intensity = 0.800(In/Hr)
100 year storm 10 minute intensity = 3.050(In/Hr)
100 year storm 60 minute intensity = 1.200(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.200(In/Hr)
Slope of intensity duration curve = 0.5200

++

Process from Point/Station 500.000 to Point/Station 501.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 630.000(Ft.)
Top (of initial area) elevation = 1428.900(Ft.)

```
Bottom (of initial area) elevation =  1426.600(Ft.)
Difference in elevation =     2.300(Ft.)
Slope =    0.00365  s(percent)=       0.37
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =   12.145 min.
Rainfall intensity =      2.754(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.887
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      2.688(CFS)
Total initial stream area =        1.100(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      501.000 to Point/Station      502.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1424.000(Ft.)
Downstream point/station elevation =  1423.700(Ft.)
Pipe length  =   118.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.688(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     2.688(CFS)
Normal flow depth in pipe =   10.38(In.)
Flow top width inside pipe =   13.85(In.)
Critical Depth =    7.89(In.)
Pipe flow velocity =      2.96(Ft/s)
Travel time through pipe =    0.66 min.
Time of concentration (TC) =    12.81 min.
End of computations, total study area =            1.10 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.100
Area averaged RI index number =  75.0
```

100-Year Offsite Flows From Basin To MDP Line A-11

```
                    Riverside County Rational Hydrology Program

        CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2004 Version 7.0
                Rational Hydrology Study        Date: 09/01/23
File:PROP100OFFSITEOUT.out
        ------------------------------------------------------------------------
        22-0198 - ETHANAC COMMERCE CENTER
        OFFSITE RATIONAL METHOD HYDROLOGY
        100 YEAR STORM EVENT - RUNOFF OUT OF BASIN
        FN: PROP100.OUT RSB
        ------------------------------------------------------------------------
         *********   Hydrology Study Control Information **********

         English (in-lb) Units used in input data file

        ------------------------------------------------------------------------


        Program License Serial Number 4010

        ------------------------------------------------------------------------
        Rational Method Hydrology Program based on
        Riverside County Flood Control & Water Conservation District
        1978 hydrology manual

        Storm event (year) =  100.00 Antecedent Moisture Condition = 2

        Standard intensity-duration curves data (Plate D-4.1)
        For the [ Homeland-Winchester ] area used.
        10 year storm 10 minute intensity =  2.030(In/Hr)
        10 year storm 60 minute intensity =  0.800(In/Hr)
        100 year storm 10 minute intensity =  3.050(In/Hr)
        100 year storm 60 minute intensity =  1.200(In/Hr)

        Storm event year = 100.0
        Calculated rainfall intensity data:
        1 hour intensity =  1.200(In/Hr)
        Slope of intensity duration curve = 0.5200




        ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
        Process from Point/Station      401.000 to Point/Station      404.000
        **** USER DEFINED FLOW INFORMATION AT A POINT ****
        ________________________________________________________________________
        Rainfall intensity =      2.025(In/Hr) for a   100.0 year storm
        SINGLE FAMILY (1/4 Acre Lot)
```

```
Runoff Coefficient = 0.819
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.500; Impervious fraction =  0.500
User specified values are as follows:
TC =  21.94 min.  Rain intensity =       2.02(In/Hr)
Total area =        64.60(Ac.)  Total runoff =     10.00(CFS)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      404.000 to Point/Station      502.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1424.000(Ft.)
Downstream point/station elevation =  1423.700(Ft.)
Pipe length  =    94.80(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    10.000(CFS)
Nearest computed pipe diameter  =     24.00(In.)
Calculated individual pipe flow  =    10.000(CFS)
Normal flow depth in pipe =   16.03(In.)
Flow top width inside pipe =   22.61(In.)
Critical Depth =   13.58(In.)
Pipe flow velocity =      4.49(Ft/s)
Travel time through pipe =    0.35 min.
Time of concentration (TC) =    22.29 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      404.000 to Point/Station      502.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     64.600(Ac.)
Runoff from this stream =     10.000(CFS)
Time of concentration =   22.29 min.
Rainfall intensity =     2.008(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      501.000 to Point/Station      502.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****
______________________________________________________________________________
Rainfall intensity =      2.559(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.887
```

```
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
User specified values are as follows:
TC =  13.99 min.  Rain intensity =       2.56(In/Hr)
Total area =         1.10(Ac.)  Total runoff =      2.70(CFS)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      501.000 to Point/Station      502.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      1.100(Ac.)
Runoff from this stream =      2.700(CFS)
Time of concentration =   13.99 min.
Rainfall intensity =     2.559(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       10.000     22.29                 2.008
2        2.700     13.99                 2.559
Largest stream flow has longer time of concentration
Qp =     10.000 + sum of
          Qb         Ia/Ib
           2.700 *    0.785 =      2.119
Qp =     12.119

Total of 2 main streams to confluence:
Flow rates before confluence point:
      10.000       2.700
Area of streams before confluence:
       64.600        1.100


Results of confluence:
Total flow rate =     12.119(CFS)
Time of concentration =    22.292 min.
Effective stream area after confluence  =     65.700(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      502.000 to Point/Station      503.000
```

```
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
_____________________________________________________________________
Upstream point/station elevation =  1423.700(Ft.)
Downstream point/station elevation =  1423.600(Ft.)
Pipe length  =    45.60(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    12.119(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    12.119(CFS)
Normal flow depth in pipe =   18.87(In.)
Flow top width inside pipe =   24.77(In.)
Critical Depth =   14.49(In.)
Pipe flow velocity =      4.08(Ft/s)
Travel time through pipe =    0.19 min.
Time of concentration (TC) =    22.48 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      502.000 to Point/Station      503.000
**** CONFLUENCE OF MAIN STREAMS ****
_____________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     65.700(Ac.)
Runoff from this stream =     12.119(CFS)
Time of concentration =   22.48 min.
Rainfall intensity =     1.999(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      403.000 to Point/Station      503.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****
_____________________________________________________________________
Rainfall intensity =      2.680(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.887
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
User specified values are as follows:
TC =  12.80 min.  Rain intensity =       2.68(In/Hr)
Total area =         1.00(Ac.)  Total runoff =      5.50(CFS)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      403.000 to Point/Station      503.000
**** CONFLUENCE OF MAIN STREAMS ****
```

```
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      1.000(Ac.)
Runoff from this stream =      5.500(CFS)
Time of concentration =   12.80 min.
Rainfall intensity =     2.680(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       12.119     22.48                 1.999
2        5.500     12.80                 2.680
Largest stream flow has longer time of concentration
Qp =     12.119 + sum of
          Qb         Ia/Ib
           5.500 *    0.746 =      4.104
Qp =     16.223

Total of 2 main streams to confluence:
Flow rates before confluence point:
      12.119       5.500
Area of streams before confluence:
       65.700        1.000


Results of confluence:
Total flow rate =     16.223(CFS)
Time of concentration =    22.478 min.
Effective stream area after confluence  =     66.700(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      503.000 to Point/Station      405.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1423.600(Ft.)
Downstream point/station elevation =  1423.500(Ft.)
Pipe length  =    22.90(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    16.223(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    16.223(CFS)
Normal flow depth in pipe =   18.14(In.)
Flow top width inside pipe =   25.35(In.)
Critical Depth =   16.85(In.)
Pipe flow velocity =      5.71(Ft/s)
Travel time through pipe =    0.07 min.
Time of concentration (TC) =    22.55 min.
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      404.000 to Point/Station      405.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     66.700(Ac.)
Runoff from this stream =     16.223(CFS)
Time of concentration =   22.55 min.
Rainfall intensity =     1.996(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      405.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****
________________________________________________________________________
Rainfall intensity =      2.680(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.887
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
User specified values are as follows:
TC =  12.80 min.  Rain intensity =       2.68(In/Hr)
Total area =        18.20(Ac.)  Total runoff =      1.00(CFS)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      102.000 to Point/Station      405.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =     18.200(Ac.)
Runoff from this stream =      1.000(CFS)
Time of concentration =   12.80 min.
Rainfall intensity =     2.680(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                (In/Hr)


1       16.223     22.55                1.996
```

```
2        1.000     12.80                 2.680
Largest stream flow has longer time of concentration
Qp =     16.223 + sum of
          Qb         Ia/Ib
           1.000 *    0.745 =      0.745
Qp =     16.968

Total of 2 main streams to confluence:
Flow rates before confluence point:
      16.223       1.000
Area of streams before confluence:
       66.700       18.200


Results of confluence:
Total flow rate =     16.968(CFS)
Time of concentration =    22.545 min.
Effective stream area after confluence  =     84.900(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      405.000 to Point/Station      406.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1423.500(Ft.)
Downstream point/station elevation =  1421.800(Ft.)
Pipe length  =   566.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    16.968(CFS)
Nearest computed pipe diameter  =     27.00(In.)
Calculated individual pipe flow  =    16.968(CFS)
Normal flow depth in pipe =   22.13(In.)
Flow top width inside pipe =   20.77(In.)
Critical Depth =   17.25(In.)
Pipe flow velocity =      4.87(Ft/s)
Travel time through pipe =    1.94 min.
Time of concentration (TC) =    24.48 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      405.000 to Point/Station      406.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =     84.900(Ac.)
Runoff from this stream =     16.968(CFS)
Time of concentration =   24.48 min.
Rainfall intensity =     1.913(In/Hr)
Program is now starting with Main Stream No. 2
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      407.000 to Point/Station      406.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****
________________________________________________________________________
Rainfall intensity =      2.941(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.888
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
RI index for soil(AMC 2)  =  75.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
User specified values are as follows:
TC =  10.70 min.  Rain intensity =       2.94(In/Hr)
Total area =         3.60(Ac.)  Total runoff =      8.90(CFS)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      407.000 to Point/Station      406.000
**** CONFLUENCE OF MAIN STREAMS ****
________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      3.600(Ac.)
Runoff from this stream =      8.900(CFS)
Time of concentration =   10.70 min.
Rainfall intensity =     2.941(In/Hr)
Summary of stream data:

Stream   Flow rate      TC            Rainfall Intensity
 No.       (CFS)       (min)                 (In/Hr)


1       16.968     24.48                 1.913
2        8.900     10.70                 2.941
Largest stream flow has longer time of concentration
Qp =     16.968 + sum of
          Qb         Ia/Ib
           8.900 *    0.650 =      5.787
Qp =     22.755

Total of 2 main streams to confluence:
Flow rates before confluence point:
      16.968       8.900
Area of streams before confluence:
       84.900        3.600
```

Results of confluence:
Total flow rate = 22.755(CFS)
Time of concentration = 24.484 min.
Effective stream area after confluence = 88.500(Ac.)

++
Process from Point/Station 406.000 to Point/Station 408.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 1421.800(Ft.)
Downstream point/station elevation = 1418.700(Ft.)
Pipe length = 1150.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 22.755(CFS)
Nearest computed pipe diameter = 33.00(In.)
Calculated individual pipe flow = 22.755(CFS)
Normal flow depth in pipe = 22.92(In.)
Flow top width inside pipe = 30.40(In.)
Critical Depth = 18.92(In.)
Pipe flow velocity = 5.17(Ft/s)
Travel time through pipe = 3.71 min.
Time of concentration (TC) = 28.19 min.
End of computations, total study area = 88.50 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.392
Area averaged RI index number = 75.0

RATIONAL METHOD HYDROLOGY MAPS

ILLINOIS AVENUE

TRUMBLE ROAD

SHERMAN ROAD

ETHANAC ROAD

POC LINE "A"
P8-421
INVERT=±1421.8
(NAVD88)

PROP LINE 4

PROP LINE 2

PROP LINE 3

PROP LINE 1

PROP LINE 5; OVERFLOW FOR ONSITE 100-YEAR STORM FLOWS FROM UNDERGROUND CHAMBERS

PROP OFFSITE FLOWS PUMP, 10 CFS MAX

PROP WQ PUMP 1 CFS MAX

PROP UNDERGROUND CMP CHAMBERS FOR ONSITE WQ, HCOC, AND 100-YR, 24-HR FLOWS

PROP UNDERGROUND CMP CHAMBERS FOR OFFSITE FLOWS

NOTE: CATCH BASINS ALONG SHERMAN INTERCEPT 163 CFS OF OFFSITE FLOW FROM EAST OF SHERMAN. SEE NODE 401 ON OFFSITE UNIT HYDROGRAPH HYDROLOGY EXHIBIT.

LEGEND

- DRAINAGE MANAGEMENT BOUNDARY
- FLOW DIRECTION
- 101 / 14xx — NODE DESIGNATION / NODE ELEVATION
- *14XX — *INVERT ELEVATION
- 5.0 / 1000' — WATERSHED AREA (ACRES) / LONGEST WATER PATH (FT)

N W E S

1" = 60'

30 0 60 120 180

CITY OF PERRIS

RATIONAL METHOD ONSITE HYDROLOGY MAP
ETHANAC LOGISTICS CENTER
P22-00030

SCALE:	1"=60'	ALBERT A. WEBB ASSOCIATES	W.O. 2022-0198
DATE:	9/1/23	ENGINEERING CONSULTANTS 3788 McCRAY STREET RIVERSIDE CA. 92506 PH. (951) 686-1070 FAX (951) 788-1256	SHEET 1
DESIGNED:	RSB		OF 1 SHEETS
CHECKED:	SKK		
PLN CK REF:			DWG. NO.
F.B.			

H:\2022\22-0198\DRAINAGE\HYD\DWG FOLDER\22-0198-PHYD-RATIONAL.DWG 9/1/2023 2:27:13 PM

BERDUGA

APPENDIX B – HYDRAULIC ANALYSIS

CITY OF PERRIS LINE A WSPG CALCULATIONS

CITY OF PERRIS LINE A - MAIN LINE WSPG

Program Package Serial Number: 1585

WATER SURFACE PROFILE LISTING

Date: 9- 1-2023 Time:11:25:25

04-425 I-215 Business Park (Main Line)

Flows from Onsite Hydrology & Offsite Basin routing

31 May 2006 TD

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT or I.D.	Base Wt ZL	No Wth Prs/Pip	L/Elem	Ch Slope	"N"	X-Fall	ZR	SF Ave	HF	SE Dpth	Froude N	Norm Dp	Type Ch
1000.000	1416.000	4.000	1420.000	85.20	6.78	.71	1420.71	.00	2.80	.00	4.000	.000	.00	1	.0									
														21.990	.0028				.0030	.07	4.00	.00	3.40	PIPE
1021.990	1416.062	4.004	1420.066	85.20	6.78	.71	1420.78	.00	2.80	.00	4.000	.000	.00	1	.0									
														JUNCT STR	.0026				.0028	.01	4.00	.00		.012
1024.990	1416.070	4.163	1420.233	79.50	6.33	.62	1420.85	.00	2.70	.00	4.000	.000	.00	1	.0									
														36.970	.0028				.0026	.10	4.16	.00	3.17	PIPE

```
         |         |         |         |         |                |         |       |
       |         |       |       |       |
  1061.960  1416.173    4.157  1420.330     79.50    6.33     .62  1420.95     .00
 2.70      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    42.830    .0028                                        .0026      .11      .00
   .00    3.16    .012       .00   .00  PIPE
         |         |         |         |         |                |         |       |
       |         |       |       |       |
  1104.790  1416.293    4.217  1420.510     79.50    6.33     .62  1421.13     .00
 2.70      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    42.830    .0028                                        .0026      .11      .00
   .00    3.16    .012       .00   .00  PIPE
         |         |         |         |         |                |         |       |
       |         |       |       |       |
  1147.620  1416.413    4.333  1420.746     79.50    6.33     .62  1421.37     .00
 2.70      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    61.970    .0028                                        .0026      .16     4.33
   .00    3.16    .012       .00   .00  PIPE
         |         |         |         |         |                |         |       |
       |         |       |       |       |
  1209.590  1416.587    4.321  1420.908     79.50    6.33     .62  1421.53     .00
 2.70      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
 JUNCT STR   .0026                                        .0025      .01    4.32
  .00             .012       .00   .00  PIPE
         |         |         |         |         |                |         |       |
       |         |       |       |       |
  1212.590  1416.595    4.413  1421.008     76.20    6.06     .57  1421.58     .00
 2.64      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    23.960    .0028                                        .0024      .06     4.41
   .00    3.04    .012       .00   .00  PIPE
         |         |         |         |         |                |         |       |
       |         |       |       |       |
  1236.550  1416.662    4.403  1421.065     76.20    6.06     .57  1421.64     .00
 2.64      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
 JUNCT STR   .0030                                        .0022      .01    4.40
  .00             .012       .00   .00  PIPE
```

Program Package Serial Number: 1585

WATER SURFACE PROFILE LISTING

Date: 9- 1-2023 Time:11:25:25

04-425 I-215 Business Park (Main Line)

Flows from Onsite Hydrology & Offsite Basin routing

31 May 2006 TD

```
**********************************************************************************************
************************************ ********
          | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super
|Critical|Flow Top|Height/|Base Wt|      |No Wth
  Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev |
Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    -|
  L/Elem  |Ch Slope |        |         |         |         SF Ave|    HF   |SE
Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch

*********|*********|********|*********|*********|*******|*******|*********|*******|*
*******|********|*******|*******|***** |*******
          |         |        |         |         |               |         |       |
       |        |       |       |      |
  1239.550  1416.671    4.569  1421.240     68.80    5.47     .47  1421.71     .00
 2.51      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    |-
    39.720    .0028                                    .0020      .08     4.57
   .00    2.80    .012       .00   .00  PIPE
          |         |        |         |         |               |         |       |
       |        |       |       |      |
  1279.270  1416.782    4.535  1421.317     68.80    5.47     .47  1421.78     .00
 2.51      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    |-
 JUNCT STR   .0028                                    .0018      .01    4.54
  .00             .012       .00   .00  PIPE
          |         |        |         |         |               |         |       |
       |        |       |       |      |
  1286.770  1416.803    4.666  1421.469     62.90    5.01     .39  1421.86     .00
 2.39      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    |-
    69.580    .0028                                    .0016      .11     4.67
   .00    2.62    .012       .00   .00  PIPE
          |         |        |         |         |               |         |       |
       |        |       |       |      |
```

```
 1356.350  1416.998    4.585  1421.583     62.90    5.01     .39  1421.97     .00
 2.39      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
 JUNCT STR   .0026                                          .0013      .00    4.58
  .00             .012       .00   .00  PIPE
          |         |        |         |         |               |         |       |
       |        |       |       |      |
 1359.350  1417.006    4.790  1421.796     48.90    3.89     .24  1422.03     .00
 2.10      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
   209.024    .0029                                          .0010      .21     4.79
   .00    2.20    .012       .00   .00  PIPE
          |         |        |         |         |               |         |       |
       |        |       |       |      |
 1568.374  1417.610    4.392  1422.002     48.90    3.89     .24  1422.24     .00
 2.10      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
 JUNCT STR   .0376                                          .0009      .01    4.39
  .00             .012       .00   .00  PIPE
          |         |        |         |         |               |         |       |
       |        |       |       |      |
 1575.874  1417.892    4.210  1422.102     42.80    3.41     .18  1422.28     .00
 1.96      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    99.806    .0000                                          .0008      .08     4.21
   .00     .00    .012       .00   .00  PIPE
          |         |        |         |         |               |         |       |
       |        |       |       |      |
 1675.680  1417.892    4.285  1422.177     42.80    3.41     .18  1422.36     .00
 1.96      .00    4.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
 JUNCT STR   .0027                                          .0010      .00    4.29
  .00             .012       .00   .00  PIPE
          |         |        |         |         |               |         |       |
       |        |       |       |      |
 1678.680  1417.900    4.252  1422.152     25.90    3.66     .21  1422.36     .00
 1.64      .00    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
   428.880    .0028                                          .0013      .55     4.25
   .00    1.81    .012       .00   .00  PIPE
```

WATER SURFACE PROFILE LISTING

Date: 9- 1-2023 Time:11:25:25

04-425 I-215 Business Park (Main Line)

Flows from Onsite Hydrology & Offsite Basin routing

31 May 2006 TD

```
**********************************************************************************************
************************************ ********
          | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super
|Critical|Flow Top|Height/|Base Wt|      |No Wth
  Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev |
Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    -|
  L/Elem  |Ch Slope |        |         |         |         SF Ave|    HF    |SE
Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch

*********|*********|********|*********|*********|*******|*******|*********|*******|*
*******|********|*******|*******|***** |*******
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  2107.560  1419.101    3.602  1422.703     25.90    3.66     .21  1422.91     .00
 1.64      .00    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    42.440    .0047                                        .0013      .05      .00
   .00    1.54    .012       .00   .00  PIPE
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  2150.000  1419.300    3.480  1422.780     25.90    3.66     .21  1422.99     .00
 1.64      .00    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
 JUNCT STR   .0033                                        .0007      .00     .00
  .00             .012       .00   .00  PIPE
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  2153.000  1419.310    3.609  1422.920      8.90    1.26     .02  1422.94     .00
  .94      .00    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    95.910    .0019                                        .0002      .01      .00
   .00    1.08    .012       .00   .00  PIPE
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  2248.910  1419.497    3.441  1422.938      8.90    1.26     .02  1422.96     .00
  .94      .00    3.000     .000   .00   1   .0
```

```
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    80.190    .0028                                    .0002      .01     3.44
   .00     .99    .012       .00   .00  PIPE
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  2329.100  1419.721    3.229  1422.950      8.90    1.26     .02  1422.97     .00
  .94      .00    3.000     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
 JUNCT STR   .0030                                    .0004      .00    3.23
  .00             .012       .00   .00  PIPE
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  2332.100  1419.730    3.215  1422.945      6.20    1.97     .06  1423.01     .00
  .88      .00    2.000     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
   287.510    .0028                                    .0006      .18     3.22
   .00     .97    .012       .00   .00  PIPE
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  2619.610  1420.535    2.594  1423.129      6.20    1.97     .06  1423.19     .00
  .88      .00    2.000     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
 JUNCT STR   .0026                                    .0005      .00    2.59
  .00             .012       .00   .00  PIPE
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  2622.610  1420.543    2.650  1423.193      4.30    1.37     .03  1423.22     .00
  .73      .00    2.000     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
   163.140    .0028                                    .0003      .05     2.65
   .00     .79    .012       .00   .00  PIPE
         |         |        |         |         |               |         |       |
       |        |       |       |      |
  2785.750  1421.000    2.244  1423.244      4.30    1.37     .03  1423.27     .00
  .73      .00    2.000     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    19.800    .0028                                    .0003      .01      .00
   .00     .79    .012       .00   .00  PIPE
```

04-425 I-215 Business Park (Main Line)

Flows from Onsite Hydrology & Offsite Basin routing

31 May 2006 TD

```
**********************************************************************************
************************************ ********
          | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super
|Critical|Flow Top|Height/|Base Wt|      |No Wth
  Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev |
Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    -|
  L/Elem  |Ch Slope |        |         |         |         SF Ave|    HF    |SE
Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch

*********|*********|********|*********|*********|*******|*******|*********|*******|*
*******|********|*******|*******|***** |*******
          |         |        |         |         |               |         |       |
       |        |       |       |      |
  2805.550  1421.056    2.198  1423.254      4.30    1.37     .03  1423.28     .00
  .73      .00    2.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
```

CITY OF PERRIS LINE A - LATERAL M-1 WSPG

Program Package Serial Number: 1585

WATER SURFACE PROFILE LISTING

Date: 9- 1-2023 Time: 1:49:15

04-425 I-215 Business Park (LATERAL M-1)

Catch Basin #1

2022-12-20 RB

```
**********************************************************************************************
************************************ ********
          | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super
|Critical|Flow Top|Height/|Base Wt|      |No Wth
  Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev |
Depth   | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    -|
  L/Elem  |Ch Slope |        |         |         |         SF Ave|    HF   |SE
Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch

*********|*********|********|*********|*********|*******|*******|*********|*******|*
*******|********|*******|*******|***** |*******
         |         |        |         |         |               |         |       |
       |        |       |       |      |
     3.500  1417.290    2.940  1420.230      5.70    1.81     .05  1420.28     .00
  .84      .00    2.000     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
     6.810    .0088                                    .0005      .00     2.94
   .00     .68    .012       .00   .00  PIPE
         |         |        |         |               |         |       |
       |        |       |       |      |
    10.310  1417.350    2.884  1420.234      5.70    1.81     .05  1420.28     .00
  .84      .00    2.000     .000   .00   1   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
  WALL  ENTRANCE

         |         |        |         |         |               |         |       |
       |        |       |       |      |
    10.310  1417.350    2.959  1420.308      5.70     .28     .00  1420.31     .00
  .27     7.00    4.950    7.000   .00   0   .0
        -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
     3.000    .0167                                    .0000      .00     2.96
   .03     .17    .012       .00   .00  RECTANG
```

```
          |         |        |         |         |                |         |       |
       |        |       |       |      |
    13.310  1417.400    2.909  1420.309      5.70     .28     .00  1420.31     .00
  .27     7.00    4.950    7.000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
```

CITY OF PERRIS LINE A - LATERAL M-2 WSPG

Program Package Serial Number: 1585

WATER SURFACE PROFILE LISTING

Date: 9- 1-2023 Time: 1:52: 5

04-425 I-215 Business Park (LATERAL M-2)

Catch Basin #2

2022-12-20 RB

```
**********************************************************************************************
************************************ ********
          | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super
|Critical|Flow Top|Height/|Base Wt|      |No Wth
  Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev |
Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    -|
  L/Elem  |Ch Slope |        |         |         |         SF Ave|    HF   |SE
Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch

*********|*********|********|*********|*********|*******|*******|*********|*******|*
*******|********|*******|*******|***** |*******
         |         |        |         |         |               |         |       |
       |        |       |       |      |
     3.780  1418.080    3.390  1421.470      2.04    1.15     .02  1421.49     .00
  .54      .00    1.500     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    18.850    .0101                                    .0003      .01     3.39
   .00     .43    .012       .00   .00  PIPE
         |         |        |         |               |         |       |
       |        |       |       |      |
    22.630  1418.270    3.206  1421.476      2.04    1.15     .02  1421.50     .00
  .54      .00    1.500     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
  WALL  ENTRANCE

         |         |        |         |         |               |         |       |
       |        |       |       |      |
    22.630  1418.270    3.237  1421.507      2.04     .06     .00  1421.51     .00
  .11    10.00    5.000   10.000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
     3.000    .0100                                    .0000      .00     3.24
   .01     .09    .012       .00   .00  RECTANG
```

```
          |         |        |         |         |                |         |       |
       |        |       |       |      |
    25.630  1418.300    3.207  1421.507      2.04     .06     .00  1421.51     .00
  .11    10.00    5.000   10.000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
```

CITY OF PERRIS LINE A - LATERAL M-4 WSPG

Program Package Serial Number: 1585

WATER SURFACE PROFILE LISTING

Date: 9- 1-2023 Time: 1:54:37

04-425 I-215 Business Park (LATERAL M-4)

Catch Basin #4

2022-12-20 RB

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT or I.D.	Base Wt ZL	No Wth Prs/Pip	L/Elem	Ch Slope	"N"	X-Fall	ZR	SF Ave HF	SE Dpth	Froude N	Norm Dp	Type Ch
3.780	1418.890	3.212	1422.102	1.45	.82	.01	1422.11	.00	.45	.00	1.500	.000	.00	1	.0								
18.850	.0095						.0002	.00	3.21	.00	.37	.012	.00	.00	PIPE								
22.630	1419.070	3.035	1422.105	1.45	.82	.01	1422.12	.00	.45	.00	1.500	.000	.00	1	.0								
WALL	ENTRANCE																						
22.630	1419.070	3.051	1422.121	1.45	.05	.00	1422.12	.00	.09	10.00	4.200	10.000	.00	0	.0								
3.000	.0100						.0000	.00	3.05	.00	.07	.012	.00	.00	RECTANG								

```
          |         |        |         |         |                |         |       |
       |        |       |       |      |
    25.630  1419.100    3.021  1422.121      1.45     .05     .00  1422.12     .00
  .09    10.00    4.200   10.000   .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
```

LINE 4 - WSPG

Program Package Serial Number: 1585

WATER SURFACE PROFILE LISTING

Date: 9- 1-2023 Time: 1:29: 5

ETHANAC LOGISTICS CENTER

22-0198 LINE 4 WSPG

2023-09-01 RSB

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**********************************************************************************************
************************************ ********
          | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super
|Critical|Flow Top|Height/|Base Wt|      |No Wth
  Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev |
Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    -|
  L/Elem  |Ch Slope |        |         |         |         SF Ave|    HF   |SE
Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch

*********|*********|********|*********|*********|*******|*******|*********|*******|*
*******|********|*******|*******|***** |*******
         |         |        |         |         |               |         |       |
        |        |       |       |       |
  1000.000  1421.800    3.620  1425.420     19.20    2.72     .11  1425.53     .00
 1.40      .00    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    38.100    .0029                                        .0008      .03     3.62
   .00    1.56    .013       .00   .00  PIPE
         |         |        |         |         |               |         |       |
        |        |       |       |       |
  1038.100  1421.910    3.542  1425.452     19.20    2.72     .11  1425.57     .00
 1.40      .00    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    78.440    .0031                                        .0008      .06      .00
   .00    1.54    .013       .00   .00  PIPE
         |         |        |         |         |               |         |       |
        |        |       |       |       |
  1116.540  1422.150    3.390  1425.540     19.20    2.72     .11  1425.65     .00
 1.40      .00    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
   180.066    .0030                                        .0008      .15     3.39
   .00    1.55    .013       .00   .00  PIPE
```

```
         |        |       |        |         |               |         |       |
       |       |       |       |       |
  1296.606  1422.689    3.000  1425.689     19.20    2.72     .11  1425.80     .00
 1.40      .00    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
   119.930    .0030                                        .0008      .09     3.00
   .00    1.55    .013       .00   .00  PIPE
         |        |       |        |         |               |         |       |
       |       |       |       |       |
  1416.536  1423.047    2.721  1425.769     19.20    2.85     .13  1425.89     .00
 1.40     1.74    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    66.196    .0030                                        .0008      .05     2.72
   .26    1.55    .013       .00   .00  PIPE
         |        |       |        |         |               |         |       |
       |       |       |       |       |
  1482.733  1423.245    2.560  1425.806     19.20    2.99     .14  1425.94     .00
 1.40     2.12    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    54.656    .0030                                        .0008      .04     2.56
   .30    1.55    .013       .00   .00  PIPE
         |        |       |        |         |               |         |       |
       |       |       |       |       |
  1537.388  1423.409    2.427  1425.836     19.20    3.13     .15  1425.99     .00
 1.40     2.36    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    27.012    .0030                                        .0009      .02     2.43
   .34    1.55    .013       .00   .00  PIPE
         |        |       |        |         |               |         |       |
       |       |       |       |       |
  1564.400  1423.490    2.362  1425.852     19.20    3.22     .16  1426.01     .00
 1.40     2.46    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
 JUNCT STR   .0067                                        .0008      .00    2.36
  .36             .013       .00   .00  PIPE
         |        |       |        |         |               |         |       |
       |       |       |       |       |
  1567.400  1423.510    2.377  1425.887     18.20    3.03     .14  1426.03     .00
 1.37     2.43    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    20.020    .0025                                        .0008      .02     2.38
   .34    1.58    .013       .00   .00  PIPE
```

Program Package Serial Number: 1585

WATER SURFACE PROFILE LISTING

Date: 9- 1-2023 Time: 1:29: 5

ETHANAC LOGISTICS CENTER

22-0198 LINE 4 WSPG

2023-09-01 RSB

```
**********************************************************************************************
************************************ ********
          | Invert  |  Depth |  Water  |    Q    |  Vel     Vel  |  Energy | Super
|Critical|Flow Top|Height/|Base Wt|      |No Wth
  Station |  Elev   |  (FT)  |  Elev   |  (CFS)  | (FPS)    Head |  Grd.El.|  Elev |
Depth  | Width  |Dia.-FT|or I.D.|  ZL  |Prs/Pip
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    -|
  L/Elem  |Ch Slope |        |         |         |         SF Ave|    HF   |SE
Dpth|Froude N|Norm Dp |  "N"  | X-Fall|  ZR  |Type Ch

*********|*********|********|*********|*********|*******|*******|*********|*******|*
*******|********|*******|*******|***** |*******
          |         |        |         |         |               |         |       |
       |        |       |       |      |
  1587.420  1423.560    2.338  1425.898     18.20    3.08     .15  1426.05     .00
 1.37     2.49    3.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    |-
 JUNCT STR   .0033                                        .0020      .01    2.34
  .35             .013       .00   .00  PIPE
          |         |        |         |         |               |         |       |
       |        |       |       |      |
  1590.420  1423.570    2.287  1425.857     12.70    4.04     .25  1426.11     .00
 1.28      .00    2.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    |-
    37.180    .0030                                        .0032      .12     2.29
   .00    1.70    .013       .00   .00  PIPE
          |         |        |         |         |               |         |       |
       |        |       |       |      |
  1627.600  1423.680    2.294  1425.974     12.70    4.04     .25  1426.23     .00
 1.28      .00    2.000     .000   .00   1   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-    |-
 JUNCT STR   .0037                                        .0004      .01    2.29
  .00             .013       .00   .00  PIPE
                       ------------------- WARNING - Junction Analysis - Change in
Channel Type ---------------
```

```
         |         |        |         |         |                |         |       |
       |        |       |       |      |
  1643.610  1423.740    2.534  1426.274      2.70    1.20     .02  1426.30     .00
   .47     1.50    1.500    1.500   .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    53.890    .0028                                        .0004      .02     2.53
   .17     .62    .013       .00   .00  BOX
         |         |        |         |         |                |         |       |
       |        |       |       |      |
  1697.500  1423.890    2.406  1426.296      2.70    1.20     .02  1426.32     .00
   .47     1.50    1.500    1.500   .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
    45.230    .0031                                        .0004      .02      .00
   .17     .59    .013       .00   .00  BOX
         |         |        |         |         |                |         |       |
       |        |       |       |      |
  1742.730  1424.030    2.289  1426.319      2.70    1.20     .02  1426.34     .00
   .47     1.50    1.500    1.500   .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
     4.500    .0031                                        .0004      .00     2.29
   .17     .59    .013       .00   .00  BOX
         |         |        |         |         |                |         |       |
       |        |       |       |      |
  1747.230  1424.044    2.277  1426.321      2.70    1.20     .02  1426.34     .00
   .47     1.50    1.500    1.500   .00   0   .0
         -|-       -|-      -|-       -|-       -|-     -|-     -|-       -|-
-|-      -|-      -|-     -|-     -|-     |-
```

APPENDIX C – BASIN ANALYSIS

EXISTING CONDITION UNIT HYDROGRAPHS

EXISTING CONDITION ONSITE 2-YEAR, 24-HOUR UNIT HYDROGRAPH

U n i t H y d r o g r a p h A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
Study date 12/14/22 File: ONSITEPRE242.out

++

Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 4010

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

22-0198 - ETHANAC COMMERCE CENTER
ONSITE UNIT HYDROGRAPH ANALYSIS
EXISITNG CONDITION, 2-YEAR 24-HOUR
FN: ONSITEPRE.OUT- RSB

Drainage Area = 19.80(Ac.) = 0.031 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 19.80(Ac.) = 0.031 Sq. Mi.
Length along longest watercourse = 1376.00(Ft.)
Length along longest watercourse measured to centroid = 686.00(Ft.)
Length along longest watercourse = 0.261 Mi.
Length along longest watercourse measured to centroid = 0.130 Mi.
Difference in elevation = 5.00(Ft.)
Slope along watercourse = 19.1860 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.113 Hr.
Lag time = 6.81 Min.
25% of lag time = 1.70 Min.
40% of lag time = 2.72 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

```
Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       19.80            1.60                  31.68

100 YEAR Area rainfall data:


Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       19.80            4.00                  79.20

STORM EVENT (YEAR) =    2.00
Area Averaged 2-Year Rainfall =    1.600(In)
Area Averaged 100-Year Rainfall =    4.000(In)

Point rain (area averaged) =    1.600(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    1.600(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    19.800           89.00         0.000
 Total Area Entered =     19.80(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-1     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
89.0  76.4      0.286     0.000        0.286       1.000      0.286
                                                 Sum (F) =   0.286
Area averaged mean soil loss (F) (In/Hr) =  0.286
Minimum soil loss rate ((In/Hr)) =  0.143
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.900
------------------------------------------------------------------------

               U n i t  H y d r o g r a p h
                       VALLEY S-Curve
------------------------------------------------------------------------
               Unit Hydrograph Data
------------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                          Graph %            (CFS)
------------------------------------------------------------------------
    1   0.083         73.448         11.521              2.299
    2   0.167        146.895         41.791              8.339
    3   0.250        220.343         21.981              4.386
    4   0.333        293.790          8.716              1.739
    5   0.417        367.238          5.287              1.055
    6   0.500        440.685          3.444              0.687
    7   0.583        514.133          2.371              0.473
    8   0.667        587.580          1.770              0.353
```

9	0.750	661.028	1.252	0.250
10	0.833	734.475	0.845	0.169
11	0.917	807.923	1.022	0.204
			Sum = 100.000	Sum= 19.955

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.013	(0.508)	0.012	0.001
2	0.17	0.07	0.013	(0.506)	0.012	0.001
3	0.25	0.07	0.013	(0.504)	0.012	0.001
4	0.33	0.10	0.019	(0.502)	0.017	0.002
5	0.42	0.10	0.019	(0.500)	0.017	0.002
6	0.50	0.10	0.019	(0.498)	0.017	0.002
7	0.58	0.10	0.019	(0.496)	0.017	0.002
8	0.67	0.10	0.019	(0.494)	0.017	0.002
9	0.75	0.10	0.019	(0.492)	0.017	0.002
10	0.83	0.13	0.026	(0.490)	0.023	0.003
11	0.92	0.13	0.026	(0.488)	0.023	0.003
12	1.00	0.13	0.026	(0.486)	0.023	0.003
13	1.08	0.10	0.019	(0.485)	0.017	0.002
14	1.17	0.10	0.019	(0.483)	0.017	0.002
15	1.25	0.10	0.019	(0.481)	0.017	0.002
16	1.33	0.10	0.019	(0.479)	0.017	0.002
17	1.42	0.10	0.019	(0.477)	0.017	0.002
18	1.50	0.10	0.019	(0.475)	0.017	0.002
19	1.58	0.10	0.019	(0.473)	0.017	0.002
20	1.67	0.10	0.019	(0.471)	0.017	0.002
21	1.75	0.10	0.019	(0.469)	0.017	0.002
22	1.83	0.13	0.026	(0.467)	0.023	0.003
23	1.92	0.13	0.026	(0.466)	0.023	0.003
24	2.00	0.13	0.026	(0.464)	0.023	0.003
25	2.08	0.13	0.026	(0.462)	0.023	0.003
26	2.17	0.13	0.026	(0.460)	0.023	0.003
27	2.25	0.13	0.026	(0.458)	0.023	0.003
28	2.33	0.13	0.026	(0.456)	0.023	0.003
29	2.42	0.13	0.026	(0.454)	0.023	0.003
30	2.50	0.13	0.026	(0.452)	0.023	0.003
31	2.58	0.17	0.032	(0.451)	0.029	0.003
32	2.67	0.17	0.032	(0.449)	0.029	0.003
33	2.75	0.17	0.032	(0.447)	0.029	0.003
34	2.83	0.17	0.032	(0.445)	0.029	0.003
35	2.92	0.17	0.032	(0.443)	0.029	0.003
36	3.00	0.17	0.032	(0.441)	0.029	0.003
37	3.08	0.17	0.032	(0.440)	0.029	0.003
38	3.17	0.17	0.032	(0.438)	0.029	0.003

39	3.25	0.17	0.032	(0.436)	0.029	0.003
40	3.33	0.17	0.032	(0.434)	0.029	0.003
41	3.42	0.17	0.032	(0.432)	0.029	0.003
42	3.50	0.17	0.032	(0.430)	0.029	0.003
43	3.58	0.17	0.032	(0.429)	0.029	0.003
44	3.67	0.17	0.032	(0.427)	0.029	0.003
45	3.75	0.17	0.032	(0.425)	0.029	0.003
46	3.83	0.20	0.038	(0.423)	0.035	0.004
47	3.92	0.20	0.038	(0.422)	0.035	0.004
48	4.00	0.20	0.038	(0.420)	0.035	0.004
49	4.08	0.20	0.038	(0.418)	0.035	0.004
50	4.17	0.20	0.038	(0.416)	0.035	0.004
51	4.25	0.20	0.038	(0.414)	0.035	0.004
52	4.33	0.23	0.045	(0.413)	0.040	0.004
53	4.42	0.23	0.045	(0.411)	0.040	0.004
54	4.50	0.23	0.045	(0.409)	0.040	0.004
55	4.58	0.23	0.045	(0.407)	0.040	0.004
56	4.67	0.23	0.045	(0.406)	0.040	0.004
57	4.75	0.23	0.045	(0.404)	0.040	0.004
58	4.83	0.27	0.051	(0.402)	0.046	0.005
59	4.92	0.27	0.051	(0.400)	0.046	0.005
60	5.00	0.27	0.051	(0.399)	0.046	0.005
61	5.08	0.20	0.038	(0.397)	0.035	0.004
62	5.17	0.20	0.038	(0.395)	0.035	0.004
63	5.25	0.20	0.038	(0.393)	0.035	0.004
64	5.33	0.23	0.045	(0.392)	0.040	0.004
65	5.42	0.23	0.045	(0.390)	0.040	0.004
66	5.50	0.23	0.045	(0.388)	0.040	0.004
67	5.58	0.27	0.051	(0.387)	0.046	0.005
68	5.67	0.27	0.051	(0.385)	0.046	0.005
69	5.75	0.27	0.051	(0.383)	0.046	0.005
70	5.83	0.27	0.051	(0.382)	0.046	0.005
71	5.92	0.27	0.051	(0.380)	0.046	0.005
72	6.00	0.27	0.051	(0.378)	0.046	0.005
73	6.08	0.30	0.058	(0.376)	0.052	0.006
74	6.17	0.30	0.058	(0.375)	0.052	0.006
75	6.25	0.30	0.058	(0.373)	0.052	0.006
76	6.33	0.30	0.058	(0.371)	0.052	0.006
77	6.42	0.30	0.058	(0.370)	0.052	0.006
78	6.50	0.30	0.058	(0.368)	0.052	0.006
79	6.58	0.33	0.064	(0.366)	0.058	0.006
80	6.67	0.33	0.064	(0.365)	0.058	0.006
81	6.75	0.33	0.064	(0.363)	0.058	0.006
82	6.83	0.33	0.064	(0.362)	0.058	0.006
83	6.92	0.33	0.064	(0.360)	0.058	0.006
84	7.00	0.33	0.064	(0.358)	0.058	0.006
85	7.08	0.33	0.064	(0.357)	0.058	0.006
86	7.17	0.33	0.064	(0.355)	0.058	0.006
87	7.25	0.33	0.064	(0.353)	0.058	0.006
88	7.33	0.37	0.070	(0.352)	0.063	0.007