Redlands West Industrial Project
DPR 20-00020
Perris, County of Riverside, CA

Preliminary Drainage Study

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SECTION 1 - SUMMARY

PURPOSE

The purpose of this report is to document the hydrologic and hydraulic analyses performed in support of the Redlands West Industrial Project located in the city of Perris, County of Riverside, California. The project is bounded by Redlands Ave to its east, vacant land to its northeast, an existing industrial building to its northwest, an existing residential tract (TR 04417) to its west, and vacant land to its south. The project proposes to build an industrial development on approximately 20.1 acres of currently vacant land. 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 necessary storage area and volume required for water quality treatment and to mitigate the increases in runoff.
- Preparation of a preliminary report summarizing the hydrology and hydraulic results.

DESCRIPTION OF WATERSHED

As previously described, the project is proposing an industrial development on approximately 20.1 acres of vacant land. Existing elevations across the site vary from 1452 to 1444 (NAVD88 datum). The existing site is generally very flat and slopes gently from west to east. Larger storm events spill over Redlands Ave and continue to flow eastwards towards the Perris Valley Storm Drain (PVSD) Channel (located approximately 2500 feet east of the project site).

The project is located within the Perris Valley Commercial Center Specific Plan and is also within the Perris Valley Master Drainage Plan watershed area. Based on a technical memorandum titled "Perris Valley MDP: Line A-B and Line A-C Tributary Watershed Modification" dated February 12, 2020 (a copy can be found in Appendix D), tributary areas within the watershed areas have been reallocated. The existing MDP Line A-B (an RCB varying in size from 7'x5' to 8'x6') runs along E. Rider Street located north of the project site. MDP Line A-B conveys flows east towards the PVSD Channel.

Lateral A-B-10 is an existing stub-out located at the intersection of Redlands Ave and E. Rider St. Based on existing as-built plans for MDP Line A-B (Appendix D), this stub-out was originally designed to convey only 15.4 cfs of runoff towards MDP Line A-B. However, based on the revised tributary areas per the technical memorandum, MDP Line A-B can now receive up to 48.0 cfs of developed flows from Lat A-B-10.

PROPOSED CONDITIONS

In the proposed condition, onsite runoff will be collected via a network of catch basins and storm drain inlets provided at localized low points throughout the site. The Redlands West project consists of a proposed industrial building along with all associated utilities, drive aisles, parking stalls, walkways, and landscaped areas. Unlike the existing condition, onsite runoff will be collected and directed north along Redlands Ave via the proposed extension of Lat A-B-10. All captured flows onsite and on Redlands Ave will be treated for water quality requirements via proposed MWS treatment devices.

Based on the technical memorandum, Lat A-B-10 is able to convey 48.0 cfs of runoff towards MDP Line A-B from a tributary area of 24.1 acres. Approximately 7.8 acres of this 24.1 acres of tributary area (about 32%) comes from currently vacant land located directly north of the Redlands West project. The remaining 16.3 acres (about 68%) comes from a portion of the Redlands West project. In the ultimate condition, the Redlands East and Redlands West industrial projects will both convey developed flows towards MDP Line A-B via Lat A-B-10.

The 7.8-acre offsite area (32% of the total 24.1 acres) tributary to Lat A-B-10 corresponds to approximately 15.5 cfs of flow (32% of the total 48 cfs that can be conveyed towards the lateral). This means MDP Line A-B has a remaining capacity of about 32.5 cfs for the combined flows of the Redlands East and Redlands West projects as both projects will convey their developed flows towards MDP Line A-B via the extension of Lat A-B-10.

The combined area of the Redlands East and Redlands West projects total approximately 32.7 acres. As this combined area is larger than the remaining 16.3 acres that Lat A-B-10 can accept flows from, all onsite flows must be directed towards proposed underground storage chambers in order to be mitigated down to an acceptable flow rate that MDP Line A-B can receive. The Redlands East and Redlands West projects will each have separate underground storage chamber systems and separate preliminary pumps to mitigate flows for each project. The combined mitigated flow rate that Lat A-B-10 can accept from the Redlands East and Redlands West projects and ultimately convey to MDP Line A-B is 32.5 cfs.

The Redlands East project provides approximately 12.6 acres tributary to MDP Line A-B. This accounts for approximately 12.5 cfs of the remaining capacity for Lat A-B-10 to convey north. The Redlands West project provides approximately 20.1 acres tributary to MDP Line A-B. This accounts for approximately 20.0 cfs of the remaining capacity for Lat A-B-10 to convey north.

Due grading constraints, a preliminary pump with the capacity of 5.0 cfs has been proposed for the Redlands West industrial project. The proposed underground chambers have been preliminarily sized to detain large storm events. A preliminary outlet structure for the underground chambers in combination with a preliminarily sized pump have been proposed in order to limit the flow rate discharging off the site. As previously described, the Redlands West project has been allotted up to 20.0 cfs of flows to discharge into the proposed Lat A-B-10 extension. A pump of capacity of 5.0 cfs has been analyzed in the routing calculations within this report, however a larger pump can be used to discharge the onsite flows (which would result in significantly smaller underground chamber sizing) in final engineering.

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 basin. 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 100-year storm events for the site. Calculations were performed for the developed condition to be

used in the analysis of the proposed underground chambers. See Section 4 for additional information and results regarding the hydrologic analyses performed for this project.

HYDRAULICS

Water quality calculations were performed using spreadsheets that were created by RCFC&WCD. Final calculations and additional details can be found in the Preliminary-WQMP.

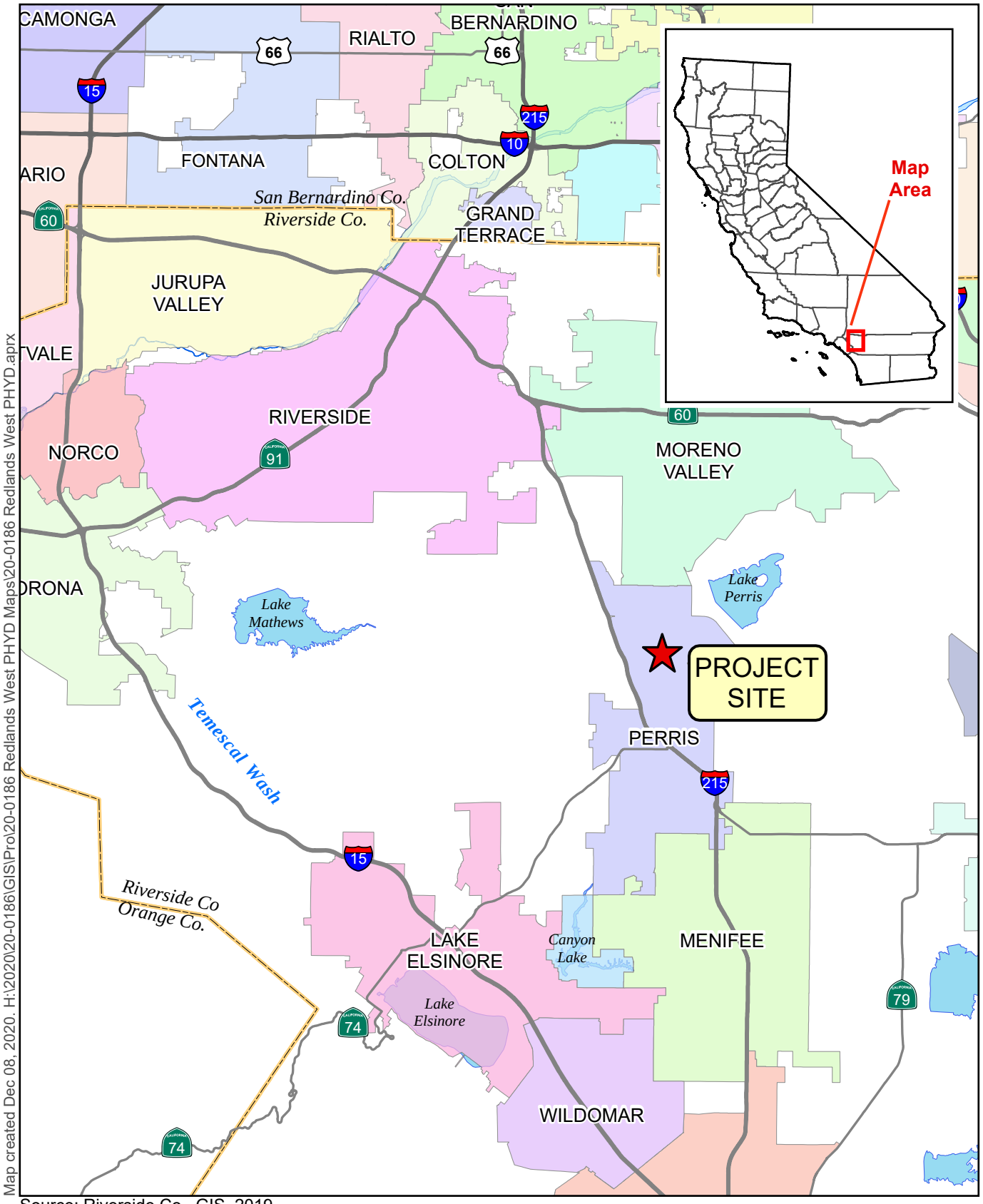
Routing calculations were performed using the CivilD computer program. The CivilD program utilizes the Modified-Puls methodology to routes unit hydrographs through a basin using the stage-storage and stage-discharge curves determined from the proposed underground chamber design. See Section 4 for additional discussion and results.

FIG. 1 VICINITY MAP

FIG. 2 USGS TOPOGRAPHY MAP

FIG. 3 AERIAL PHOTOGRAPH

FIG. 4 RECEIVING WATERBODIES



Source: Riverside Co. GIS, 2019

0 2 4 6 Miles

Figure 1 – Vicinity Map

20-0186 Redlands West Industrial

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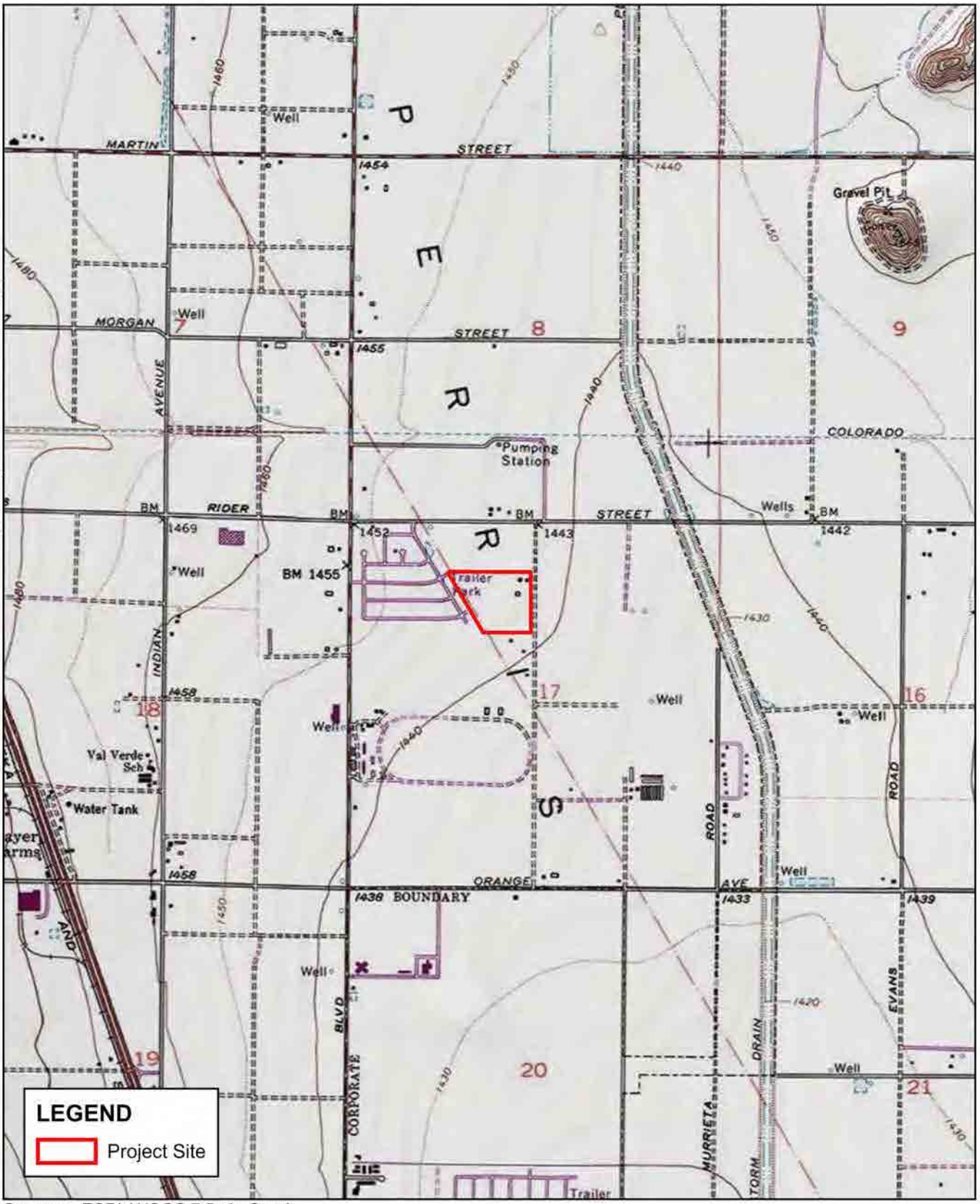

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Sources: ESRI / USGS 7.5min Quad
DRGs: PERRIS

Figure 2 - USGS Map
20-0186 Redlands West Industrial

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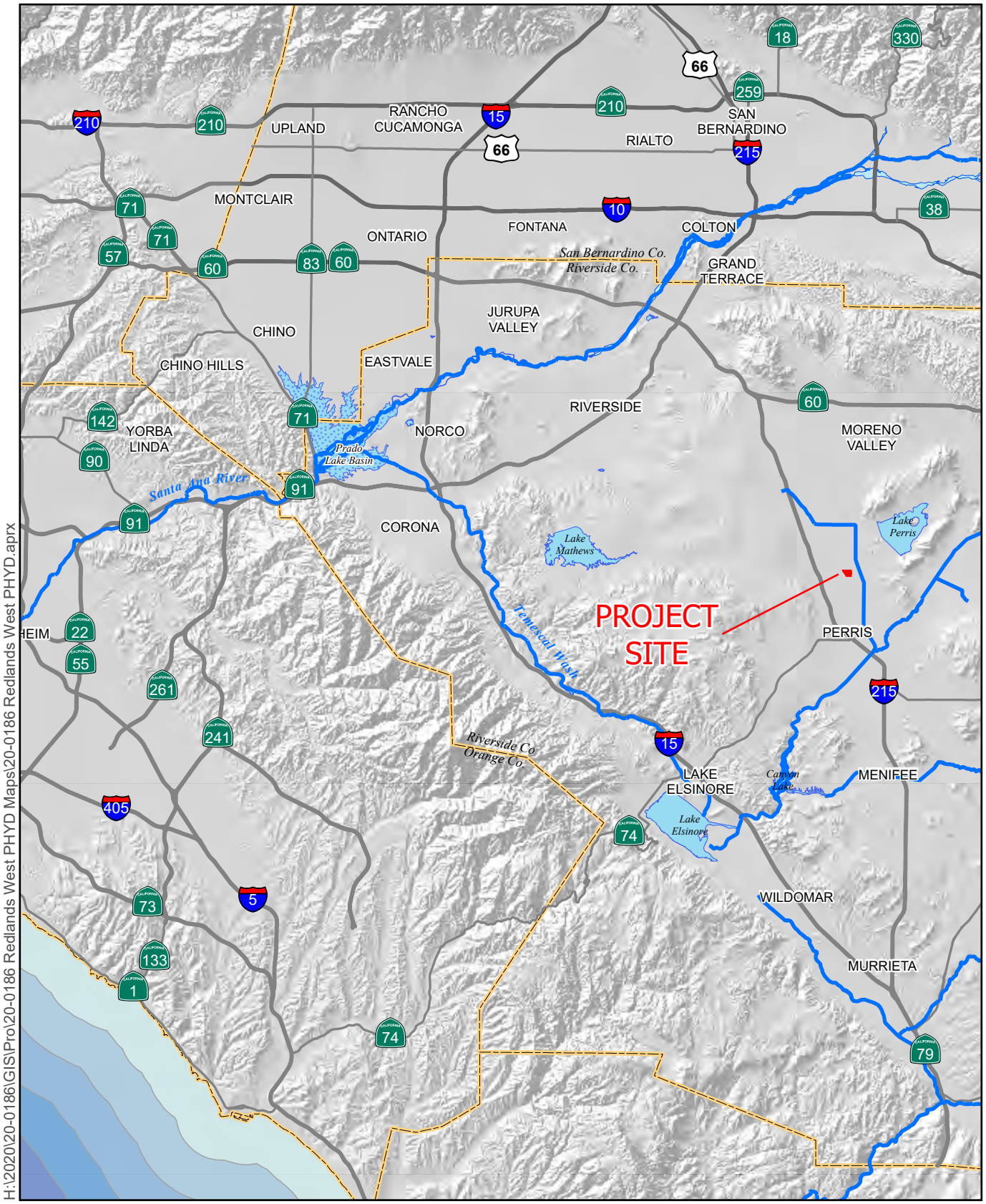
Source: Riverside Co. GIS, Jan. 2020.

Figure 3 - Aerial Map

20-0186 Redlands West Industrial

0 600 1,200 1,800 Feet

ALBERT A. WEBB ASSOCIATES



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Sources: USGS DLG; USGS 30m DEM

0 2 4 6 8 Miles

Figure 4 – Receiving Waterbodies

20-0186 Redlands West Industrial

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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 Values

	Duration	Duration
Storm Event	1-Hour (inches)	24-Hour (inches)
2-Year	0.45	1.7
100-Year	1.2	4.25

The value for slope of intensity was determined to be 0.5. The isohyetal maps have been included in Appendix A.

Based on the Plate C-1.30, Perris in the RCFC&WCD Hydrology Manual, the project site is classified as soil types B and C. 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 developed condition were done using 'Urban Residential or Commercial Landscaping'. 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
Developed – Urban Residential or Commercial Landscaping	N/A	56	69	N/A	75.5

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 proposed basins. Calculations were performed for approximately 20.1 acres of the developed area. This area includes the onsite development as well as improvements to Redlands Ave that are contained within the project boundaries. The rational method calculations for the Redlands West project were broken up into two main areas. The "300 Series" consists of approximately 19.1 acres of area consisting mainly of the onsite improvements that are proposed for development. The "400 Series" consists of approximately 1.0 acres of area tributary to the proposed inlets located on Redlands Ave.

Areas within the rational method calculations were further broken up based on the location of localized low points throughout the site. Most subareas will consist of a combination of the proposed building,

parking stalls, drive aisles, concrete walkways, and/or landscaped areas. All onsite areas within the calculations are considered as commercial subarea types.

A preliminary pump has been proposed to convey a constant flow rate of 5.0 cfs towards the proposed Lat A-B-10 extension. The proposed underground chambers have been sized to mitigate larger storm events and allow for the preliminary pump and outlet structure to limit the peak flow rate exiting the site.

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

Table 3 – Rational Method Results

Point of Interest	10-Year Peak Flow Rate (cfs)	100-Year Peak Flow Rate (cfs)
Node 399 – Total flow entering UG Chambers	32.3	46.7
Node 399* – Mitigated flow exiting UG Chambers	-	9.0
Node 465* – Mitigated flow from Redlands East & West	-	15.4

**Peak flow rate obtained from Routing analysis.*

The rational method output files and hydrology map have been included in Appendix A. Approximately 46.7 cfs of runoff enters the underground storage chambers for the 100-year, 1-hour storm event. The unit hydrograph analysis and routing analysis accounts for the full 20.1 acres of gross area within the Redlands East project boundary. This provides a conservative estimate of the proposed peak flow rates as the runoff collected within Redlands Ave will not actually enter the proposed underground chambers. The 400 Series accounts for the unmitigated flow rates collected along Redlands Ave.

The combination of underground storage chambers and a proposed pump (5.0 cfs capacity) results in a peak flow rate of 9.0 cfs exiting the site towards Lat A-B-10 (see Section 4 for additional details).

OFF-SITE RATIONAL METHOD HYDROLOGY

The "400 Series" provides calculations for the proposed storm drain conveying flows underneath Redlands Ave towards MDP Line A-B. These calculations combine the results of the rational method calculations regarding both the Redlands East and the Redlands West projects. The flow rates entering the storm drain from the Redlands East and Redlands West projects are entered as user-defined flow rates within the 400 Series. This allows the mitigated flow rates (see Section 4) for each project to be entered into Lat A-B-10 and compared to the 32.5 cfs allowable capacity.

See Appendix A for the output files of the off-site rational method analysis.

SECTION 3 - HYDRAULIC ANALYSIS

Hydraulic calculations will be performed in the Final Drainage Study.

SECTION 4 - BASIN 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 storage chambers to address increased runoff mitigation. Unit hydrographs were performed for the developed condition. As previously stated, the revised capacity of Lat A-B-10 is 48.0 cfs. The combined flow rate from the development of the Redlands East and Redlands West projects totals 32.5 cfs. The Redlands West project is provided about 20.0 cfs of flow to discharge into Lat A-B-10.

The unit hydrograph analysis and routing analysis accounts for the full 20.1 acres of gross area within the Redlands West project boundary. This provides a conservative estimate of the proposed peak flow rates as the runoff collected within Redlands Ave will not actually enter the proposed underground chambers. The following table summarizes the results of the unit hydrograph analysis for both the Redlands East and Redlands West projects:

Table 4 – Unit Hydrograph Results

DEVELOPED CONDITION								
	EAST			WEST			COMBINED	
RETURN PERIOD *(yr)*	EVENT *(hrs)*	VOL *(ac-ft)*	*PEAK (cfs)*	EVENT *(hrs)*	VOL *(ac-ft)*	*PEAK (cfs)*	VOL *(ac-ft)*	*PEAK (cfs)*
100	**1**	**1.1**	***36.37***	1	1.8	*49.37*	2.9	*85.74*
	3	**1.6**	***20.47***	3	2.6	*30.85*	4.2	*51.32*
	6	**2.1**	***17.76***	6	3.2	*26.80*	5.3	*44.56*
	24	**3.3**	***5.81***	24	5.3	*9.27*	8.6	*15.08*

The unit hydrograph output files and hydrology map have been included in Appendix C. Table 4 above provides results for the Redlands West project (highlighted in yellow) and the Redlands East project (separate drainage study).

ROUTING ANALYSIS

Based on the unit hydrograph results shown in Table 4 above, the peak flow rates for the 100-year, 1/3/6-hour storm events are all greater than the allowable 20.0 cfs designated for the Redlands West project. In this preliminary drainage study, a routing analysis was completed for the 100-year, 1/3/6-hour storm events to demonstrate that the underground storage chambers contain substantial volume needed to mitigate flows down to the allowable peak flow rates.

The stage-storage-discharge table provides input data at select elevations in the underground chambers which will determine the storage and discharge at each point based on the mitigation configuration of the outlet structure. The following table presents the result of routing analysis for the 1-, 3-, and 6-hour, 100-year storm events to demonstrate that the chambers provide the necessary storage volume needed to restrict the outflow to acceptable flow rates. In order to show that the proposed chambers provide adequate storage, Table 5 shows results for the routing analysis of the Redlands East (highlighted in yellow) project and Redlands West project (separate drainage study).

Table 5 – Basin Routing Results

	Developed Condition		Basin Routing Results		
Storm Event	**Volume (Ac-ft)**	**Peak Flow (cfs)**	**Peak Flow (cfs)**	**Max Basin Depth (feet)**	**Water Surface Elevation (cfs)**
EAST 100-Year, 1-Hour	1.1	36.4	5.0	3.98	1434.98
WEST 100-Year, 1-Hour	1.8	49.4	5.0	5.22	1440.72
COMBINED 100-Year, 1-Hour	**2.9**	**85.8**	**10.0**	-	-
EAST 100-Year, 3-Hour	1.6	20.5	5.0	3.59	1434.59
WEST 100-Year, 3-Hour	2.6	30.9	9.0	5.97	1441.47
COMBINED 100-Year, 3-Hour	**4.2**	**51.4**	**14.0**	-	-
EAST 100-Year, 6-Hour	2.1	17.8	5.0	3.05	1434.05
WEST 100-Year, 6-Hour	3.2	26.8	7.0	5.74	1441.24
COMBINED 100-Year, 6-Hour	**5.3**	**44.6**	**12.0**	-	-
EAST 100-Year, 24-Hour	3.3	5.8	5.0	0.55	1431.55
WEST 100-Year, 24-Hour	5.3	9.3	5.0	2.09	1437.59
COMBINED 100-Year, 24-Hour	**8.6**	**15.1**	**10.0**	-	-

Redlands West elevation for bottom of storage chamber is 1435.5 (bottom of stone is 1434.75).
Redlands East maximum allotted flow rate to discharge towards Lat A-B-10 is Q=20.0 cfs.

A preliminary pump with the capacity of 5.0 cfs has been proposed for the Redlands West industrial project. The proposed underground chambers have been preliminarily sized to detain large storm events. A preliminary outlet structure for the underground chambers in combination with a preliminarily sized pump have been proposed to in order to limit the flow rate discharging off the site. As described in previous sections of the report, the Redlands West project has been allotted up to 20.0 cfs of flows to discharge into the proposed Lat A-B-10 extension. A pump of capacity of 5.0 cfs has been analyzed in the routing calculations within this report, however a larger pump can be used to discharge the onsite flows (which would result in significantly smaller underground chamber sizing) in final engineering.

The routing calculations and other hydraulic calculations have been provided in Appendix C. Based on the routing results in Table 5, the peak flow rate is 9.0 cfs (occurring in the 100-year, 3-hour storm event). The total combined flow rate entering Lat A-B-10 from the Redlands East and Redlands West projects totals 14.0 cfs which is below the allotted 32.5 cfs.

Table 5 – Basin Routing Results

	Developed Condition		Basin Routing Results		
Storm Event	**Volume (Ac-ft)**	**Peak Flow (cfs)**	**Peak Flow (cfs)**	**Max Basin Depth (feet)**	**Water Surface Elevation (cfs)**
EAST 100-Year, 1-Hour	1.1	36.4	5.0	3.98	1434.98
WEST 100-Year, 1-Hour	1.8	49.4	5.0	5.22	1440.72
COMBINED 100-Year, 1-Hour	**2.9**	**85.8**	**10.0**	-	-
EAST 100-Year, 3-Hour	1.6	20.5	5.0	3.59	1434.59
WEST 100-Year, 3-Hour	2.6	30.9	9.0	5.97	1441.47
COMBINED 100-Year, 3-Hour	**4.2**	**51.4**	**14.0**	-	-
EAST 100-Year, 6-Hour	2.1	17.8	5.0	3.05	1434.05
WEST 100-Year, 6-Hour	3.2	26.8	7.0	5.74	1441.24
COMBINED 100-Year, 6-Hour	**5.3**	**44.6**	**12.0**	-	-
EAST 100-Year, 24-Hour	3.3	5.8	5.0	0.55	1431.55
WEST 100-Year, 24-Hour	5.3	9.3	5.0	2.09	1437.59
COMBINED 100-Year, 24-Hour	**8.6**	**15.1**	**10.0**	-	-

Redlands West elevation for bottom of storage chamber is 1435.5 (bottom of stone is 1434.75).
Redlands East maximum allotted flow rate to discharge towards Lat A-B-10 is Q=20.0 cfs.

A preliminary pump with the capacity of 5.0 cfs has been proposed for the Redlands West industrial project. The proposed underground chambers have been preliminarily sized to detain large storm events. A preliminary outlet structure for the underground chambers in combination with a preliminarily sized pump have been proposed to in order to limit the flow rate discharging off the site. As described in previous sections of the report, the Redlands West project has been allotted up to 20.0 cfs of flows to discharge into the proposed Lat A-B-10 extension. A pump of capacity of 5.0 cfs has been analyzed in the routing calculations within this report, however a larger pump can be used to discharge the onsite flows (which would result in significantly smaller underground chamber sizing) in final engineering.

The routing calculations and other hydraulic calculations have been provided in Appendix C. Based on the routing results in Table 5, the peak flow rate is 9.0 cfs (occurring in the 100-year, 3-hour storm event). The total combined flow rate entering Lat A-B-10 from the Redlands East and Redlands West projects totals 14.0 cfs which is below the allotted 32.5 cfs.

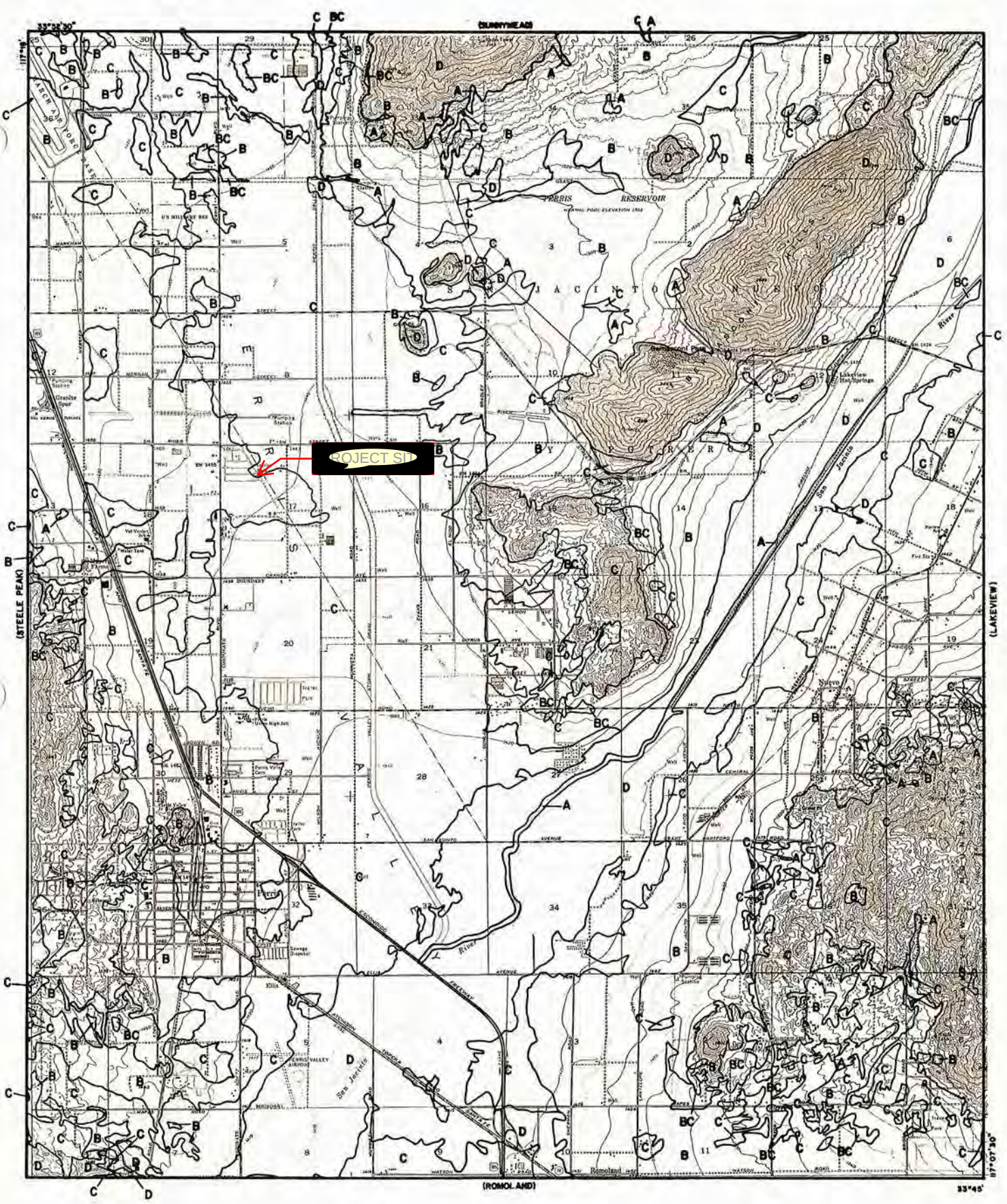
SECTION 5 - CONCLUSION

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 storage chambers and provide flood protection for the 100-year storm event.
- The proposed underground chambers will provide adequate water quality treatment.
- The proposed project will not impact flooding condition to upstream or downstream properties.

APPENDIX A – HYDROLOGY ANALYSIS

HYDROLOGIC SOILS GROUP MAP (PLATE C-1.30)



LEGEND

—— SOILS GROUP BOUNDARY

A SOILS GROUP DESIGNATION

RCFC&WCD

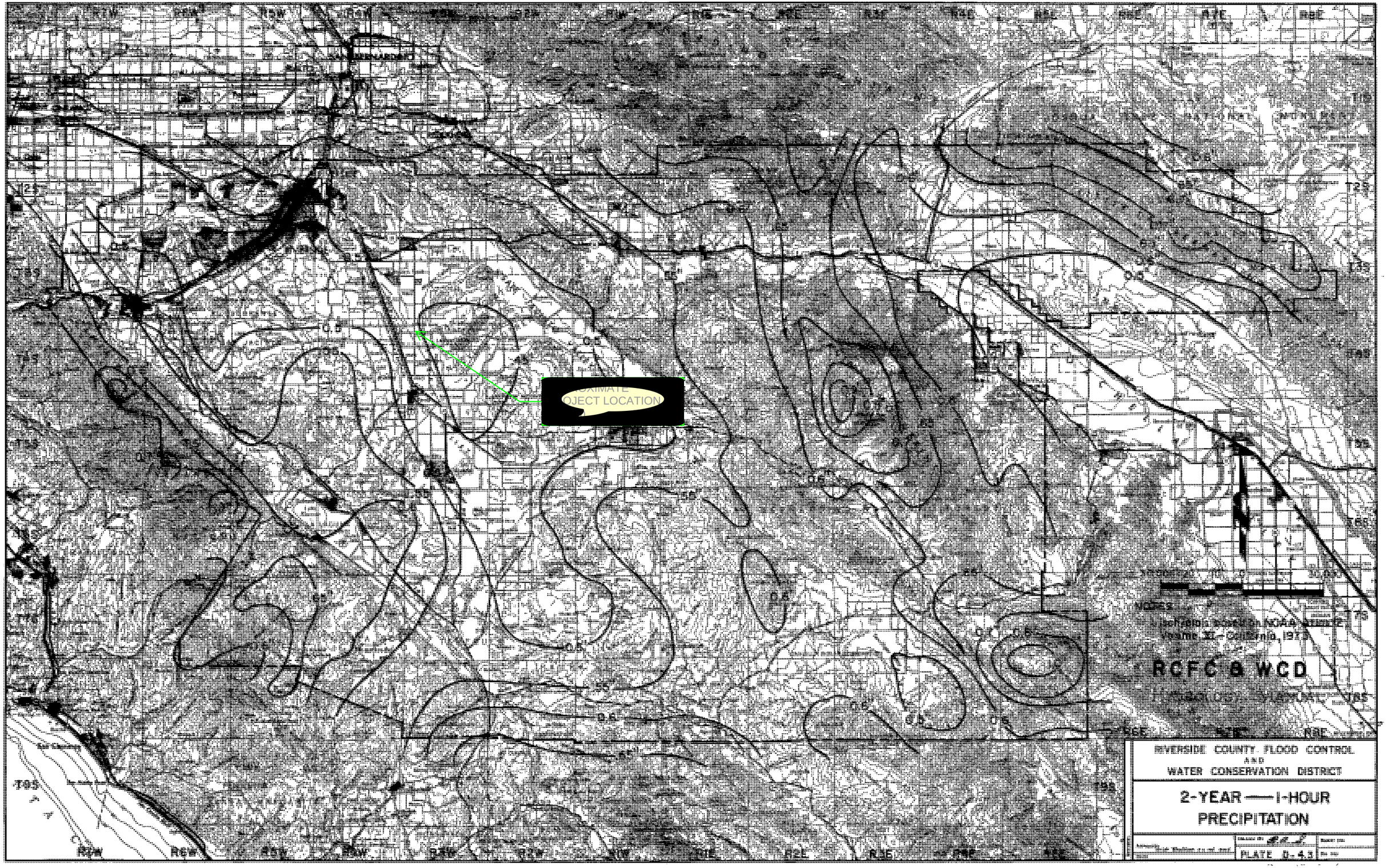
HYDROLOGY MANUAL

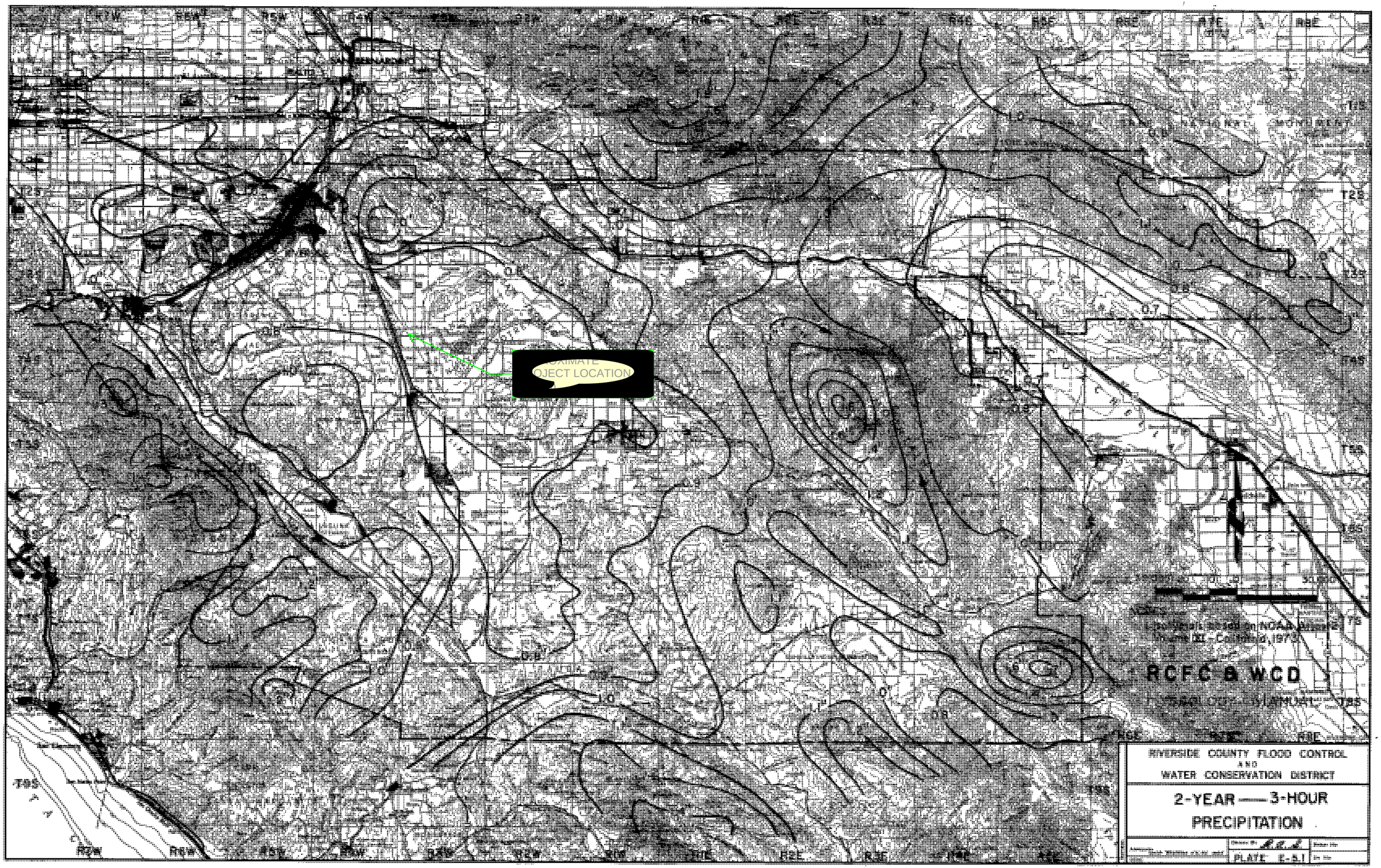
0 FEET 5000

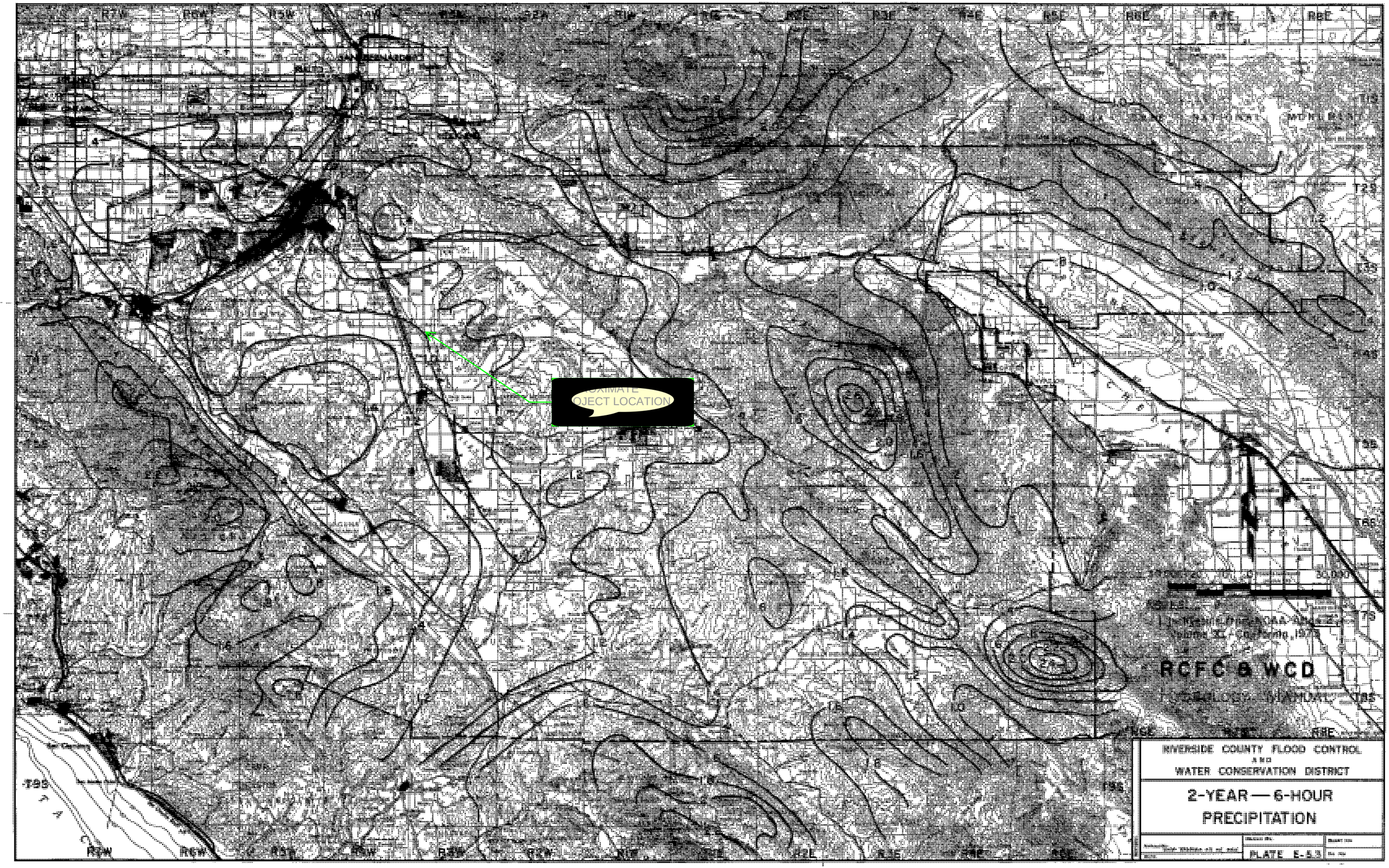
HYDROLOGIC SOILS GROUP MAP FOR PERRIS

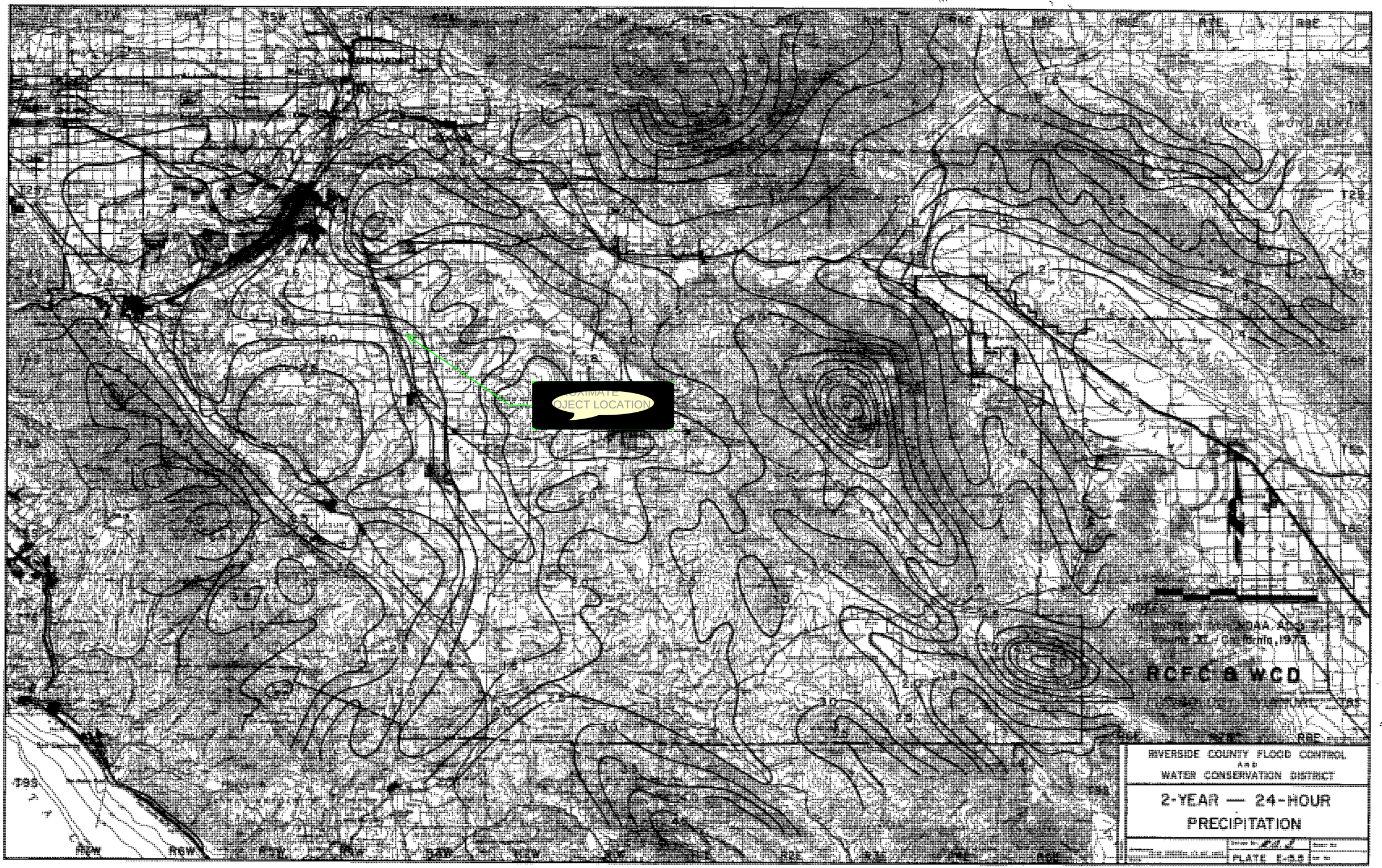
PLATE C-1.30

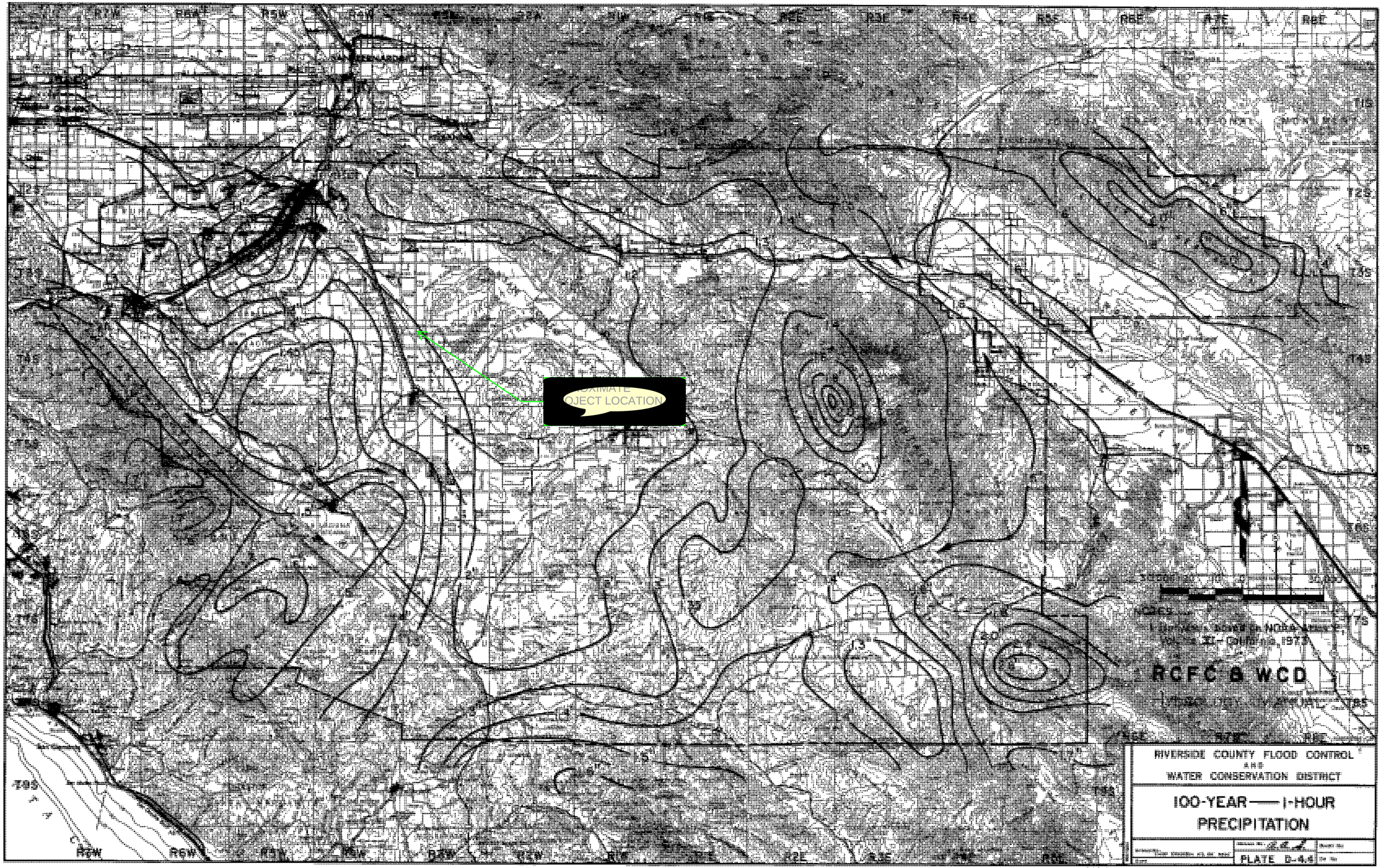
PRECIPITATION VALUES

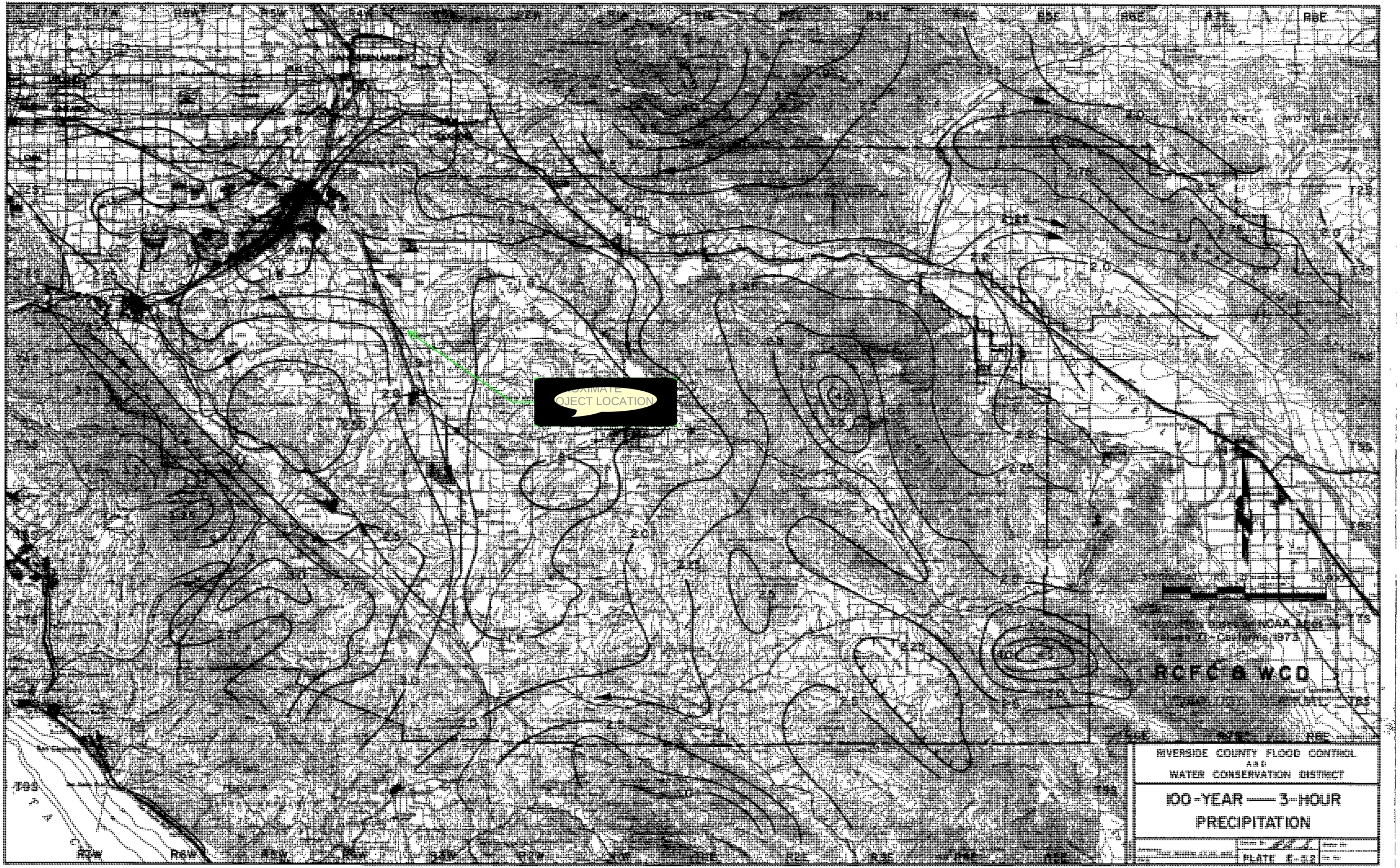

APPROXIMATE
PROJECT LOCATION
NOTES
Isohyetals based on NOAA Atlas II
Volume XI - California, 1973
RCFC & WCD
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
2-YEAR — 1-HOUR
PRECIPITATION
PLATE D-4.3

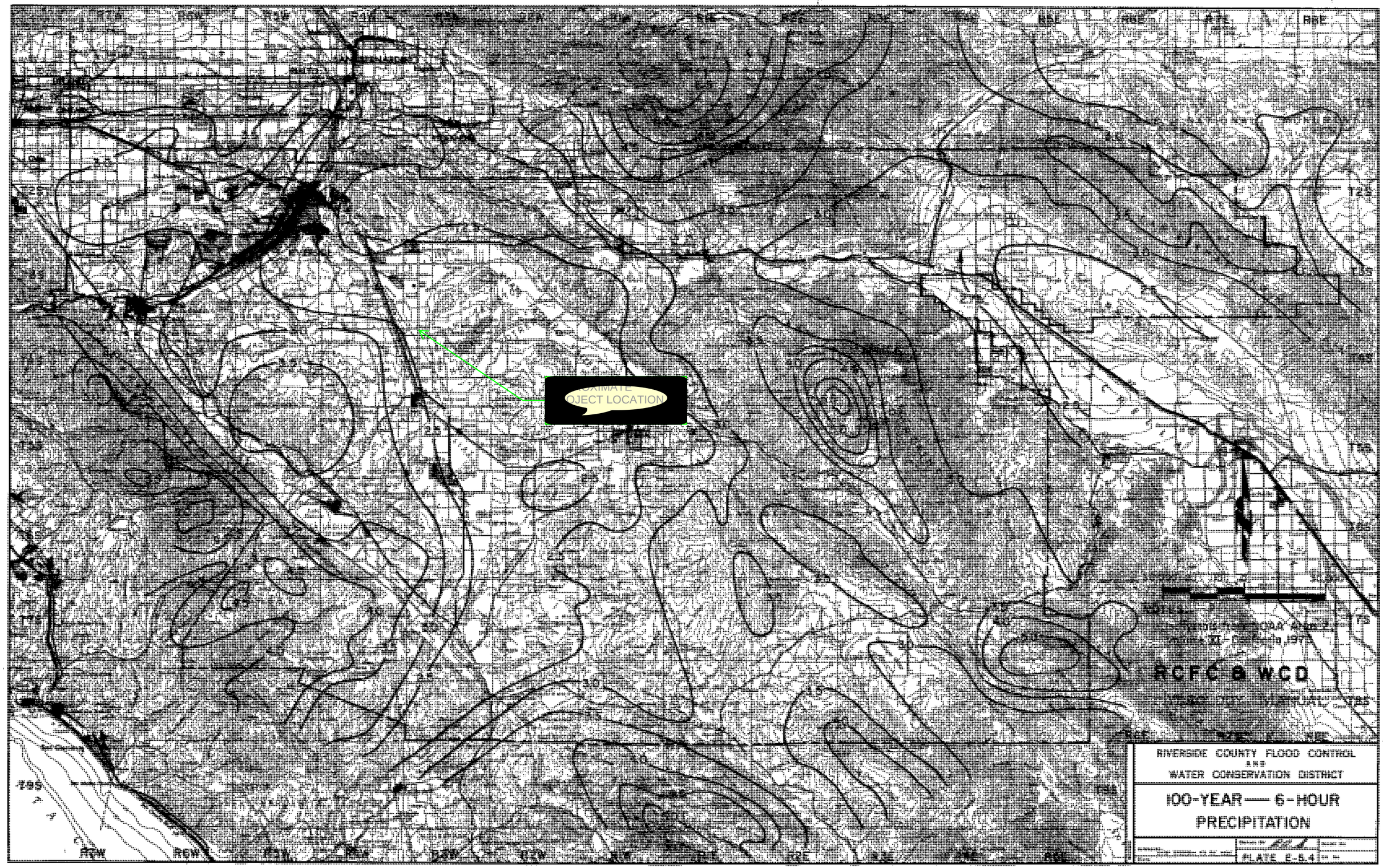

APPROXIMATE
PROJECT LOCATION
RCFC & WCD
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
2-YEAR — 3-HOUR
PRECIPITATION
PLATE E-8.1

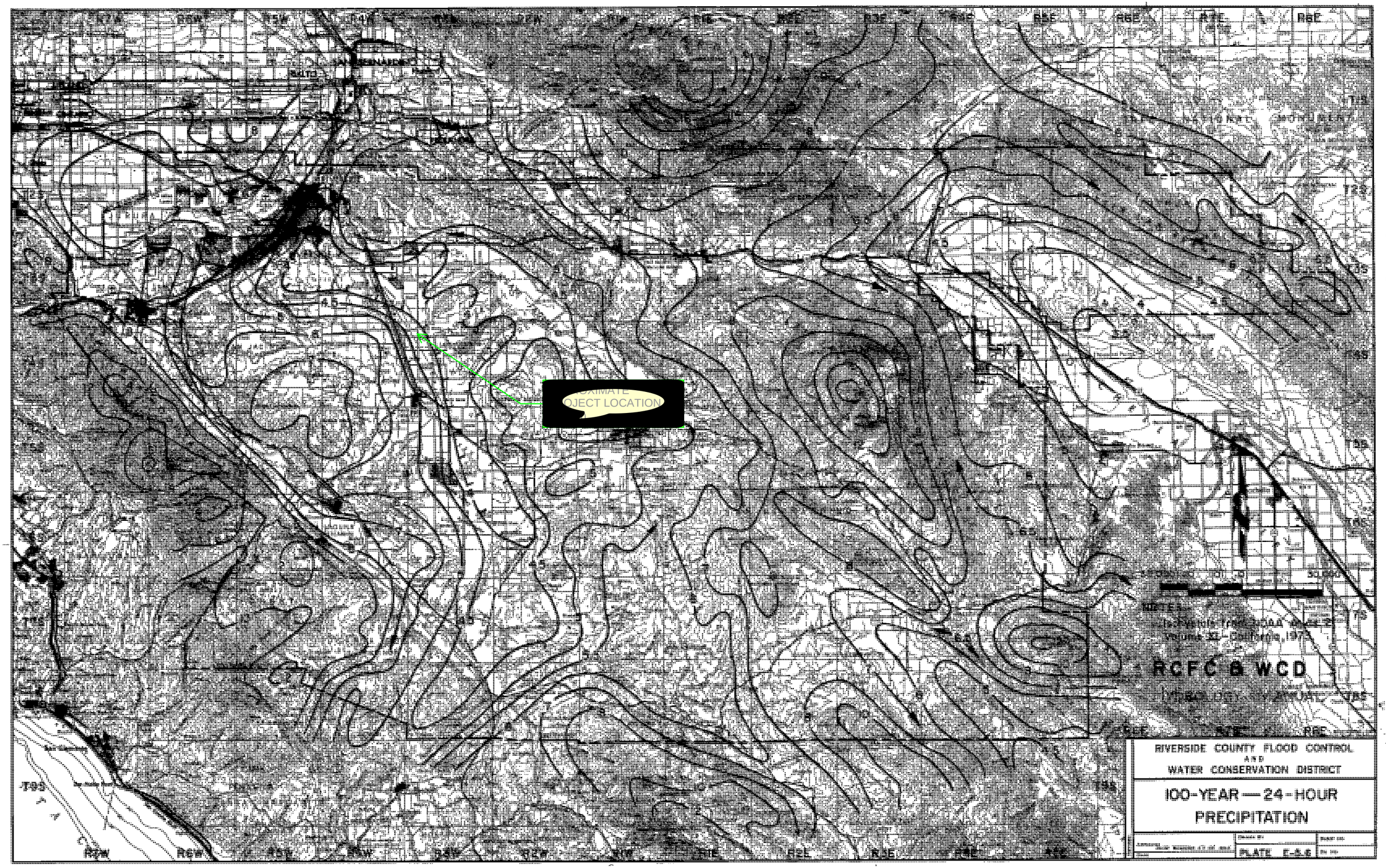

APPROXIMATE
PROJECT LOCATION
RCFC & WCD
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
2-YEAR — 6-HOUR
PRECIPITATION
PLATE E-5.3

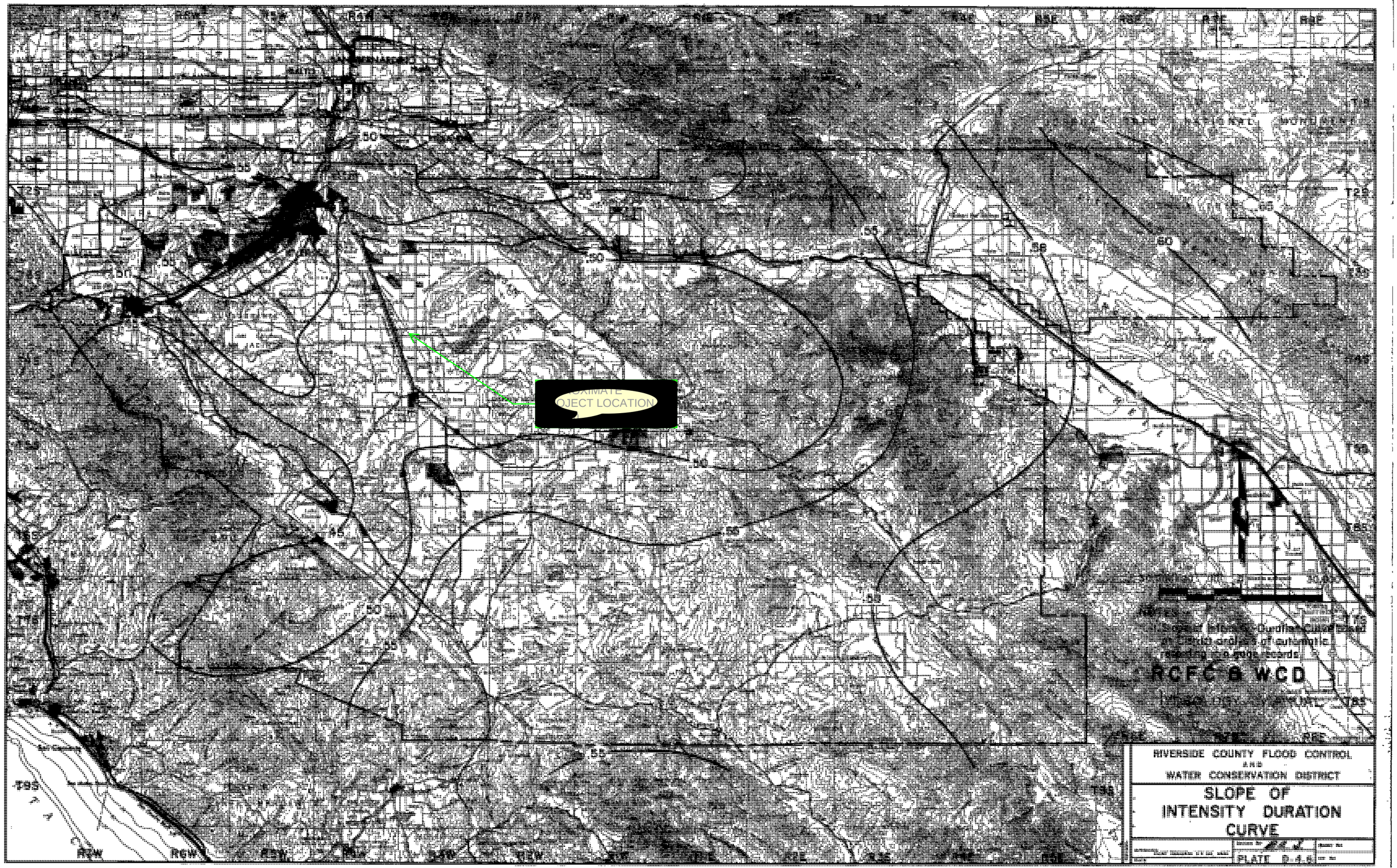

APPROXIMATE
PROJECT LOCATION
NOTES:
1. Isohyets were drawn on NOAA Atlas 2, Volume XI - California, 1973.
RCFC & WCD
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
2-YEAR — 24-HOUR
PRECIPITATION
PLATE E-5.5


APPROXIMATE
PROJECT LOCATION
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR — 1-HOUR
PRECIPITATION
PLATE D-4.4
RCFC & WCD


APPROXIMATE
PROJECT LOCATION
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR — 3-HOUR
PRECIPITATION
PLATE E-5.2
RCFC & WCD

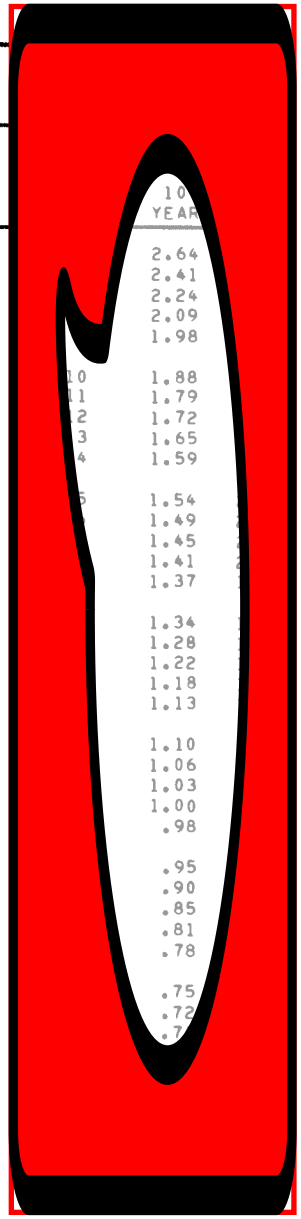

APPROXIMATE
PROJECT LOCATION
NOTES:
RCFC & WCD
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR — 6-HOUR
PRECIPITATION
PLATE E-5.4


APPROXIMATE
PROJECT LOCATION
NOTES:
1. PRECIPITATION FREQUENCIES BASED ON
RAINFALL DATA THROUGH WATER YEAR 1977
RCFC & WCD
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
100-YEAR — 24-HOUR
PRECIPITATION
PLATE E-6.6


APPROXIMATE
PROJECT LOCATION
Slope of Intensity-Duration Curve used
in Rational Method of automatic
rainfall recording gages
RCFC & WCD
RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
SLOPE OF
INTENSITY DURATION
CURVE
PLATE D-4.6

RAINFALL INTENSITY—INCHES PER HOUR

MIRA LOMA			MURRIETA - TEMECULA & RANCHO CALIFORNIA			NORCO			PALM SPRINGS		
DURATION MINUTES	FREQUENCY		DURATION MINUTES	FREQUENCY		DURATION MINUTES	FREQUENCY		DURATION MINUTES	FREQUENCY	
	10 YEAR	100 YEAR		10 YEAR	100 YEAR		10 YEAR	100 YEAR		10 YEAR	100 YEAR
5	2.84	4.48	5	3.45	5.10	5	2.77	4.16	5	4.23	6.76
6	2.58	4.07	6	3.12	4.61	6	2.53	3.79	6	3.80	6.08
7	2.37	3.75	7	2.87	4.24	7	2.34	3.51	7	3.48	5.56
8	2.21	3.49	8	2.67	3.94	8	2.19	3.29	8	3.22	5.15
9	2.08	3.28	9	2.50	3.69	9	2.07	3.10	9	3.01	4.81
10	1.96	3.10	10	2.36	3.48	10	1.96	2.94	10	2.83	4.52
11	1.87	2.95	11	2.24	3.30	11	1.87	2.80	11	2.67	4.28
12	1.78	2.82	12	2.13	3.15	12	1.79	2.68	12	2.54	4.07
13	1.71	2.70	13	2.04	3.01	13	1.72	2.58	13	2.43	3.88
14	1.64	2.60	14	1.96	2.89	14	1.66	2.48	14	2.33	3.72
15	1.58	2.50	15	1.89	2.79	15	1.60	2.40	15	2.23	3.58
16	1.53	2.42	16	1.82	2.69	16	1.55	2.32	16	2.15	3.44
17	1.48	2.34	17	1.76	2.60	17	1.50	2.25	17	2.08	3.32
18	1.44	2.27	18	1.71	2.52	18	1.46	2.19	18	2.01	3.22
19	1.40	2.21	19	1.66	2.45	19	1.42	2.13	19	1.95	3.12
20	1.36	2.15	20	1.61	2.38	20	1.39	2.08	20	1.89	3.03
22	1.29	2.04	22	1.53	2.26	22	1.32	1.98	22	1.79	2.86
24	1.24	1.95	24	1.46	2.15	24	1.26	1.90	24	1.70	2.72
26	1.18	1.87	26	1.39	2.06	26	1.22	1.82	26	1.62	2.60
28	1.14	1.80	28	1.34	1.98	28	1.17	1.76	28	1.56	2.49
30	1.10	1.73	30	1.29	1.90	30	1.13	1.70	30	1.49	2.39
32	1.06	1.67	32	1.24	1.84	32	1.10	1.64	32	1.44	2.30
34	1.03	1.62	34	1.20	1.78	34	1.06	1.59	34	1.39	2.22
36	1.00	1.57	36	1.17	1.72	36	1.03	1.55	36	1.34	2.15
38	.97	1.53	38	1.13	1.67	38	1.01	1.51	38	1.30	2.09
40	.94	1.49	40	1.10	1.62	40	.98	1.47	40	1.27	2.02
45	.89	1.40	45	1.03	1.52	45	.92	1.39	45	1.18	1.89
50	.84	1.32	50	.97	1.44	50	.88	1.31	50	1.11	1.78
55	.80	1.26	55	.92	1.36	55	.84	1.25	55	1.05	1.68
60	.76	1.20	60	.88	1.30	60	.80	1.20	60	1.00	1.60
65	.73	1.15	65	.84	1.24	65	.77	1.15	65	.95	1.53
70	.70	1.11	70	.81	1.19	70	.74	1.11	70	.91	1.46
75	.68	1.07	75	.78	1.15	75	.72	1.07	75	.88	1.41
80	.65	1.03	80	.75	1.11	80	.69	1.04	80	.85	1.35
85	.63	1.00	85	.73	1.07	85	.67	1.01	85	.82	1.31
SLOPE = .530			SLOPE = .550			SLOPE = .500			SLOPE = .580		



RCFC & WCD

HYDROLOGY MANUAL

STANDARD INTENSITY-DURATION CURVES DATA

PLATE D-4.1 (4 of 6)

10-YEAR ONSITE HYDROLOGY (RATIONAL METHOD)

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
Rational Hydrology Study Date: 06/26/23 File:300.out

REDLANDS WEST - 300 SERIES
10-YEAR STORM EVENT
20-0186 - DEVELOPED CONDITION
2023-06-26 WG

********* 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 [Perris Valley] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.780(In/Hr)
100 year storm 10 minute intensity = 2.690(In/Hr)
100 year storm 60 minute intensity = 1.120(In/Hr)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.780(In/Hr)
Slope of intensity duration curve = 0.4900

++
Process from Point/Station 301.000 to Point/Station 302.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 397.000(Ft.)
Top (of initial area) elevation = 1447.000(Ft.)
Bottom (of initial area) elevation = 1444.200(Ft.)

```
Difference in elevation =     2.800(Ft.)
Slope =    0.00705  s(percent)=       0.71
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.850 min.
Rainfall intensity =      1.992(In/Hr) for a    10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.877
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.250
Decimal fraction soil group C = 0.750
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  65.75
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      6.987(CFS)
Total initial stream area =        4.000(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      302.000 to Point/Station      399.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1440.200(Ft.)
Downstream point/station elevation =  1434.750(Ft.)
Pipe length  =   254.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     6.987(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     6.987(CFS)
Normal flow depth in pipe =    9.59(In.)
Flow top width inside pipe =   14.41(In.)
Critical Depth =   12.71(In.)
Pipe flow velocity =      8.44(Ft/s)
Travel time through pipe =    0.50 min.
Time of concentration (TC) =     9.35 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      399.000 to Point/Station      399.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      4.000(Ac.)
Runoff from this stream =      6.987(CFS)
Time of concentration =    9.35 min.
Rainfall intensity =     1.939(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
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```
Process from Point/Station      303.000 to Point/Station      304.000
**** INITIAL AREA EVALUATION ****
----------------------------------------------------------------------
Initial area flow distance =   650.000(Ft.)
Top (of initial area) elevation =  1450.800(Ft.)
Bottom (of initial area) elevation =  1442.900(Ft.)
Difference in elevation =     7.900(Ft.)
Slope =    0.01215  s(percent)=       1.22
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.668 min.
Rainfall intensity =      1.908(In/Hr) for a    10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.877
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.130
Decimal fraction soil group C = 0.870
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  67.31
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      9.707(CFS)
Total initial stream area =        5.800(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      304.000 to Point/Station      399.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------
Upstream point/station elevation =  1438.500(Ft.)
Downstream point/station elevation =  1434.750(Ft.)
Pipe length  =    59.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     9.707(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     9.707(CFS)
Normal flow depth in pipe =    8.34(In.)
Flow top width inside pipe =   14.90(In.)
Critical Depth =   14.12(In.)
Pipe flow velocity =     13.85(Ft/s)
Travel time through pipe =    0.07 min.
Time of concentration (TC) =     9.74 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      399.000 to Point/Station      399.000
**** CONFLUENCE OF MAIN STREAMS ****
----------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      5.800(Ac.)
Runoff from this stream =      9.707(CFS)
```

```
Time of concentration =    9.74 min.
Rainfall intensity =     1.901(In/Hr)
Program is now starting with Main Stream No. 3


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      306.000 to Point/Station      307.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   200.000(Ft.)
Top (of initial area) elevation =  1446.600(Ft.)
Bottom (of initial area) elevation =  1443.300(Ft.)
Difference in elevation =     3.300(Ft.)
Slope =    0.01650  s(percent)=       1.65
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    5.676 min.
Rainfall intensity =      2.477(In/Hr) for a    10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.876
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.670
Decimal fraction soil group C = 0.330
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  60.29
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      8.683(CFS)
Total initial stream area =        4.000(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      307.000 to Point/Station      399.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1439.300(Ft.)
Downstream point/station elevation =  1434.750(Ft.)
Pipe length  =   558.10(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     8.683(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     8.683(CFS)
Normal flow depth in pipe =   13.55(In.)
Flow top width inside pipe =   15.53(In.)
Critical Depth =   13.68(In.)
Pipe flow velocity =      6.09(Ft/s)
Travel time through pipe =    1.53 min.
Time of concentration (TC) =     7.20 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      399.000 to Point/Station      399.000
```

```
**** CONFLUENCE OF MAIN STREAMS ****
_____________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =      4.000(Ac.)
Runoff from this stream =      8.683(CFS)
Time of concentration =    7.20 min.
Rainfall intensity =     2.204(In/Hr)
Program is now starting with Main Stream No. 4


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      308.000 to Point/Station      309.000
**** INITIAL AREA EVALUATION ****
_____________________________________________________________________
Initial area flow distance =   402.000(Ft.)
Top (of initial area) elevation =  1445.500(Ft.)
Bottom (of initial area) elevation =  1443.000(Ft.)
Difference in elevation =     2.500(Ft.)
Slope =    0.00622  s(percent)=       0.62
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.122 min.
Rainfall intensity =      1.963(In/Hr) for a    10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.869
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      5.969(CFS)
Total initial stream area =        3.500(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      309.000 to Point/Station      399.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
_____________________________________________________________________
Upstream point/station elevation =  1439.000(Ft.)
Downstream point/station elevation =  1434.750(Ft.)
Pipe length  =    56.57(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.969(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     5.969(CFS)
Normal flow depth in pipe =    6.77(In.)
Flow top width inside pipe =   11.90(In.)
Critical depth could not be calculated.
Pipe flow velocity =     13.05(Ft/s)
```

```
Travel time through pipe =    0.07 min.
Time of concentration (TC) =     9.19 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      399.000 to Point/Station      399.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 4
Stream flow area =      3.500(Ac.)
Runoff from this stream =      5.969(CFS)
Time of concentration =    9.19 min.
Rainfall intensity =     1.956(In/Hr)
Program is now starting with Main Stream No. 5


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      310.000 to Point/Station      311.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   336.000(Ft.)
Top (of initial area) elevation =  1446.700(Ft.)
Bottom (of initial area) elevation =  1444.100(Ft.)
Difference in elevation =     2.600(Ft.)
Slope =    0.00774  s(percent)=       0.77
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.127 min.
Rainfall intensity =      2.077(In/Hr) for a    10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.870
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      1.807(CFS)
Total initial stream area =        1.000(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      311.000 to Point/Station      314.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1440.100(Ft.)
Downstream point/station elevation =  1437.800(Ft.)
Pipe length  =   278.80(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.807(CFS)
```

```
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     1.807(CFS)
Normal flow depth in pipe =    6.41(In.)
Flow top width inside pipe =   11.97(In.)
Critical Depth =    6.87(In.)
Pipe flow velocity =      4.23(Ft/s)
Travel time through pipe =    1.10 min.
Time of concentration (TC) =     9.22 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      314.000 to Point/Station      314.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 5 in normal stream number 1
Stream flow area =      1.000(Ac.)
Runoff from this stream =      1.807(CFS)
Time of concentration =    9.22 min.
Rainfall intensity =     1.952(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      312.000 to Point/Station      313.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   258.000(Ft.)
Top (of initial area) elevation =  1447.200(Ft.)
Bottom (of initial area) elevation =  1445.100(Ft.)
Difference in elevation =     2.100(Ft.)
Slope =    0.00814  s(percent)=       0.81
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.239 min.
Rainfall intensity =      2.199(In/Hr) for a    10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.879
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.200
Decimal fraction soil group C = 0.800
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  66.40
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      1.546(CFS)
Total initial stream area =        0.800(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      313.000 to Point/Station      314.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
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```
Upstream point/station elevation =  1440.000(Ft.)
Downstream point/station elevation =  1437.800(Ft.)
Pipe length  =    24.50(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.546(CFS)
Nearest computed pipe diameter  =      6.00(In.)
Calculated individual pipe flow  =     1.546(CFS)
Normal flow depth in pipe =    4.54(In.)
Flow top width inside pipe =    5.15(In.)
Critical depth could not be calculated.
Pipe flow velocity =      9.72(Ft/s)
Travel time through pipe =    0.04 min.
Time of concentration (TC) =     7.28 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      314.000 to Point/Station      314.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 5 in normal stream number 2
Stream flow area =      0.800(Ac.)
Runoff from this stream =      1.546(CFS)
Time of concentration =    7.28 min.
Rainfall intensity =     2.192(In/Hr)
Summary of stream data:

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


1        1.807      9.22                1.952
2        1.546      7.28                2.192
Largest stream flow has longer time of concentration
Qp =      1.807 + sum of
          Qb         Ia/Ib
           1.546 *    0.891 =      1.377
Qp =      3.184

Total of 2 streams to confluence:
Flow rates before confluence point:
       1.807       1.546
Area of streams before confluence:
        1.000        0.800
Results of confluence:
Total flow rate =      3.184(CFS)
Time of concentration =     9.225 min.
Effective stream area after confluence =      1.800(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      314.000 to Point/Station      399.000
```

```
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
_____________________________________________________________________
Upstream point/station elevation =  1437.800(Ft.)
Downstream point/station elevation =  1434.750(Ft.)
Pipe length  =   758.50(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.184(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =     3.184(CFS)
Normal flow depth in pipe =    9.94(In.)
Flow top width inside pipe =   14.19(In.)
Critical Depth =    8.61(In.)
Pipe flow velocity =      3.69(Ft/s)
Travel time through pipe =    3.43 min.
Time of concentration (TC) =    12.65 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      399.000 to Point/Station      399.000
**** CONFLUENCE OF MAIN STREAMS ****
_____________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 5
Stream flow area =      1.800(Ac.)
Runoff from this stream =      3.184(CFS)
Time of concentration =   12.65 min.
Rainfall intensity =     1.672(In/Hr)
Summary of stream data:

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


1        6.987      9.35                1.939
2        9.707      9.74                1.901
3        8.683      7.20                2.204
4        5.969      9.19                1.956
5        3.184     12.65                1.672
Largest stream flow has longer or shorter time of concentration
Qp =      9.707 + sum of
          Qb         Ia/Ib
           6.987 *    0.980 =      6.850
          Qb         Ia/Ib
           8.683 *    0.863 =      7.491
          Qb         Ia/Ib
           5.969 *    0.972 =      5.803
          Qa          Tb/Ta
           3.184 *    0.770 =      2.451
Qp =     32.301

Total of 5 main streams to confluence:
```

Flow rates before confluence point:
6.987 9.707 8.683 5.969 3.184
Area of streams before confluence:
4.000 5.800 4.000 3.500 1.800

Results of confluence:
Total flow rate = 32.301(CFS)
Time of concentration = 9.739 min.
Effective stream area after confluence = 19.100(Ac.)
End of computations, total study area = 19.10 (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 = 62.8

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
Rational Hydrology Study Date: 06/27/23 File:40W.out

REDLANDS WEST- 400 SERIES (REDLANDS AVE)
10-YEAR STORM EVENT
20-0186 - DEVELOPED CONDITION
2023/06/26 WG

********* 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 [Perris Valley] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.780(In/Hr)
100 year storm 10 minute intensity = 2.690(In/Hr)
100 year storm 60 minute intensity = 1.120(In/Hr)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.780(In/Hr)
Slope of intensity duration curve = 0.4900

++
Process from Point/Station 410.000 to Point/Station 411.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 380.000(Ft.)
Top (of initial area) elevation = 1447.000(Ft.)
Bottom (of initial area) elevation = 1444.600(Ft.)

```
Difference in elevation =     2.400(Ft.)
Slope =    0.00632  s(percent)=       0.63
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.891 min.
Rainfall intensity =      1.988(In/Hr) for a    10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.869
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      1.382(CFS)
Total initial stream area =        0.800(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      411.000 to Point/Station      450.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1440.400(Ft.)
Downstream point/station elevation =  1440.200(Ft.)
Pipe length  =    60.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.382(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     1.382(CFS)
Normal flow depth in pipe =    7.20(In.)
Flow top width inside pipe =   11.76(In.)
Critical Depth =    5.97(In.)
Pipe flow velocity =      2.81(Ft/s)
Travel time through pipe =    0.36 min.
Time of concentration (TC) =     9.25 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      450.000 to Point/Station      450.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      0.800(Ac.)
Runoff from this stream =      1.382(CFS)
Time of concentration =    9.25 min.
Rainfall intensity =     1.950(In/Hr)


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Process from Point/Station      501.000 to Point/Station      450.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****
```

```
Rainfall intensity =      1.765(In/Hr) for a    10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.866
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
User specified values are as follows:
TC =  11.33 min.  Rain intensity =       1.77(In/Hr)
Total area =         1.00(Ac.)  Total runoff =      1.54(CFS)


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Process from Point/Station      450.000 to Point/Station      450.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      1.000(Ac.)
Runoff from this stream =      1.545(CFS)
Time of concentration =   11.33 min.
Rainfall intensity =     1.765(In/Hr)
Summary of stream data:

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


1        1.382      9.25                 1.950
2        1.545     11.33                 1.765
Largest stream flow has longer time of concentration
Qp =      1.545 + sum of
          Qb         Ia/Ib
           1.382 *    0.905 =      1.251
Qp =      2.796

Total of 2 streams to confluence:
Flow rates before confluence point:
       1.382       1.545
Area of streams before confluence:
        0.800        1.000
Results of confluence:
Total flow rate =      2.796(CFS)
Time of concentration =    11.330 min.
Effective stream area after confluence =      1.800(Ac.)


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Process from Point/Station      450.000 to Point/Station      455.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1440.200(Ft.)
Downstream point/station elevation =  1439.900(Ft.)
Pipe length  =   210.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.796(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     2.796(CFS)
Normal flow depth in pipe =   11.14(In.)
Flow top width inside pipe =   17.48(In.)
Critical Depth =    7.61(In.)
Pipe flow velocity =      2.43(Ft/s)
Travel time through pipe =    1.44 min.
Time of concentration (TC) =    12.77 min.


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Process from Point/Station      455.000 to Point/Station      455.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      1.800(Ac.)
Runoff from this stream =      2.796(CFS)
Time of concentration =   12.77 min.
Rainfall intensity =     1.665(In/Hr)


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Process from Point/Station      299.100 to Point/Station      299.100
**** USER DEFINED FLOW INFORMATION AT A POINT ****
------------------------------------------------------------------------
Rainfall intensity =      1.360(In/Hr) for a    10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.862
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.900
Decimal fraction soil group C = 0.100
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  57.30
Pervious area fraction =  0.100; Impervious fraction =  0.900
User specified values are as follows:
TC =  19.30 min.  Rain intensity =       1.36(In/Hr)
Total area =        11.70(Ac.)  Total runoff =      5.00(CFS)


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Process from Point/Station      299.100 to Point/Station      455.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
```

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Upstream point/station elevation =  1440.400(Ft.)
Downstream point/station elevation =  1439.900(Ft.)
Pipe length  =   110.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.000(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     5.000(CFS)
Normal flow depth in pipe =   11.16(In.)
Flow top width inside pipe =   17.48(In.)
Critical Depth =   10.32(In.)
Pipe flow velocity =      4.34(Ft/s)
Travel time through pipe =    0.42 min.
Time of concentration (TC) =    19.72 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      455.000 to Point/Station      455.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =     11.700(Ac.)
Runoff from this stream =      5.000(CFS)
Time of concentration =   19.72 min.
Rainfall intensity =     1.345(In/Hr)
Summary of stream data:

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


1        2.796     12.77                1.665
2        5.000     19.72                1.345
Largest stream flow has longer time of concentration
Qp =      5.000 + sum of
          Qb         Ia/Ib
           2.796 *    0.808 =      2.259
Qp =      7.259

Total of 2 streams to confluence:
Flow rates before confluence point:
       2.796       5.000
Area of streams before confluence:
        1.800       11.700
Results of confluence:
Total flow rate =      7.259(CFS)
Time of concentration =    19.722 min.
Effective stream area after confluence =     13.500(Ac.)


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Process from Point/Station      455.000 to Point/Station      460.000
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**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
_____________________________________________________________________
Upstream point/station elevation =  1439.900(Ft.)
Downstream point/station elevation =  1439.500(Ft.)
Pipe length  =   135.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.259(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =     7.259(CFS)
Normal flow depth in pipe =   14.77(In.)
Flow top width inside pipe =   19.19(In.)
Critical Depth =   11.96(In.)
Pipe flow velocity =      4.02(Ft/s)
Travel time through pipe =    0.56 min.
Time of concentration (TC) =    20.28 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      460.000 to Point/Station      460.000
**** CONFLUENCE OF MINOR STREAMS ****
_____________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     13.500(Ac.)
Runoff from this stream =      7.259(CFS)
Time of concentration =   20.28 min.
Rainfall intensity =     1.327(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      412.000 to Point/Station      413.000
**** INITIAL AREA EVALUATION ****
_____________________________________________________________________
Initial area flow distance =   250.000(Ft.)
Top (of initial area) elevation =  1447.300(Ft.)
Bottom (of initial area) elevation =  1445.500(Ft.)
Difference in elevation =     1.800(Ft.)
Slope =    0.00720  s(percent)=       0.72
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.325 min.
Rainfall intensity =      2.186(In/Hr) for a    10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.876
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  62.50
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      0.766(CFS)
Total initial stream area =        0.400(Ac.)
Pervious area fraction = 0.100
```

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Process from Point/Station      413.000 to Point/Station      460.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1439.100(Ft.)
Downstream point/station elevation =  1439.500(Ft.)
Pipe length  =    40.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     0.766(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     0.766(CFS)
Normal flow depth in pipe =    4.30(In.)
Flow top width inside pipe =    8.99(In.)
Critical Depth =    4.79(In.)
Pipe flow velocity =      3.67(Ft/s)
Travel time through pipe =    0.18 min.
Time of concentration (TC) =     7.51 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      460.000 to Point/Station      460.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      0.400(Ac.)
Runoff from this stream =      0.766(CFS)
Time of concentration =    7.51 min.
Rainfall intensity =     2.160(In/Hr)
Summary of stream data:

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


1        7.259     20.28                1.327
2        0.766      7.51                2.160
Largest stream flow has longer time of concentration
Qp =      7.259 + sum of
          Qb         Ia/Ib
           0.766 *    0.614 =      0.471
Qp =      7.730

Total of 2 streams to confluence:
Flow rates before confluence point:
       7.259       0.766
Area of streams before confluence:
       13.500        0.400
Results of confluence:
Total flow rate =      7.730(CFS)
```

```
Time of concentration =    20.282 min.
Effective stream area after confluence =     13.900(Ac.)


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Process from Point/Station      460.000 to Point/Station      465.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1439.500(Ft.)
Downstream point/station elevation =  1438.800(Ft.)
Pipe length  =   240.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.730(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =     7.730(CFS)
Normal flow depth in pipe =   15.63(In.)
Flow top width inside pipe =   18.32(In.)
Critical Depth =   12.35(In.)
Pipe flow velocity =      4.03(Ft/s)
Travel time through pipe =    0.99 min.
Time of concentration (TC) =    21.27 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      465.000 to Point/Station      465.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     13.900(Ac.)
Runoff from this stream =      7.730(CFS)
Time of concentration =   21.27 min.
Rainfall intensity =     1.296(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      399.000 to Point/Station      399.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****
________________________________________________________________________
Rainfall intensity =      1.594(In/Hr) for a    10.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.870
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  62.50
Pervious area fraction =  0.100; Impervious fraction =  0.900
User specified values are as follows:
TC =  13.95 min.  Rain intensity =       1.59(In/Hr)
Total area =        18.90(Ac.)  Total runoff =      9.00(CFS)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      399.000 to Point/Station      465.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1441.000(Ft.)
Downstream point/station elevation =  1438.800(Ft.)
Pipe length  =   700.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     9.000(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =     9.000(CFS)
Normal flow depth in pipe =   17.48(In.)
Flow top width inside pipe =   15.68(In.)
Critical Depth =   13.37(In.)
Pipe flow velocity =      4.21(Ft/s)
Travel time through pipe =    2.77 min.
Time of concentration (TC) =    16.72 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      465.000 to Point/Station      465.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =     18.900(Ac.)
Runoff from this stream =      9.000(CFS)
Time of concentration =   16.72 min.
Rainfall intensity =     1.459(In/Hr)
Summary of stream data:

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


1        7.730     21.27                1.296
2        9.000     16.72                1.459
Largest stream flow has longer or shorter time of concentration
Qp =      9.000 + sum of
          Qa          Tb/Ta
           7.730 *    0.786 =      6.076
Qp =     15.076

Total of 2 streams to confluence:
Flow rates before confluence point:
       7.730       9.000
Area of streams before confluence:
       13.900       18.900
Results of confluence:
Total flow rate =     15.076(CFS)
Time of concentration =    16.724 min.
```

Effective stream area after confluence = 32.800(Ac.)
End of computations, total study area = 32.80 (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 = 60.3

100-YEAR ONSITE HYDROLOGY (RATIONAL METHOD)

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
Rational Hydrology Study Date: 06/27/23 File:300.out

REDLANDS WEST - 300 SERIES
100-YEAR STORM EVENT
20-0186 - DEVELOPED CONDITION
2023-06-27 WG

********* 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 [Perris Valley] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.780(In/Hr)
100 year storm 10 minute intensity = 2.690(In/Hr)
100 year storm 60 minute intensity = 1.120(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.120(In/Hr)
Slope of intensity duration curve = 0.4900

++
Process from Point/Station 301.000 to Point/Station 302.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 397.000(Ft.)
Top (of initial area) elevation = 1447.000(Ft.)
Bottom (of initial area) elevation = 1444.200(Ft.)

```
Difference in elevation =     2.800(Ft.)
Slope =    0.00705  s(percent)=       0.71
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.850 min.
Rainfall intensity =      2.861(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.882
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.250
Decimal fraction soil group C = 0.750
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  65.75
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =     10.098(CFS)
Total initial stream area =        4.000(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      302.000 to Point/Station      399.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1440.200(Ft.)
Downstream point/station elevation =  1434.750(Ft.)
Pipe length  =   254.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    10.098(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =    10.098(CFS)
Normal flow depth in pipe =   10.64(In.)
Flow top width inside pipe =   17.70(In.)
Critical Depth =   14.70(In.)
Pipe flow velocity =      9.29(Ft/s)
Travel time through pipe =    0.46 min.
Time of concentration (TC) =     9.31 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      399.000 to Point/Station      399.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 1
Stream flow area =      4.000(Ac.)
Runoff from this stream =     10.098(CFS)
Time of concentration =    9.31 min.
Rainfall intensity =     2.791(In/Hr)
Program is now starting with Main Stream No. 2


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
```

```
Process from Point/Station      303.000 to Point/Station      304.000
**** INITIAL AREA EVALUATION ****
----------------------------------------------------------------------
Initial area flow distance =   650.000(Ft.)
Top (of initial area) elevation =  1450.800(Ft.)
Bottom (of initial area) elevation =  1442.900(Ft.)
Difference in elevation =     7.900(Ft.)
Slope =    0.01215  s(percent)=       1.22
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.668 min.
Rainfall intensity =      2.740(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.883
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.130
Decimal fraction soil group C = 0.870
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  67.31
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =     14.028(CFS)
Total initial stream area =        5.800(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      304.000 to Point/Station      399.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
----------------------------------------------------------------------
Upstream point/station elevation =  1438.500(Ft.)
Downstream point/station elevation =  1434.750(Ft.)
Pipe length  =    59.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    14.028(CFS)
Nearest computed pipe diameter  =     15.00(In.)
Calculated individual pipe flow  =    14.028(CFS)
Normal flow depth in pipe =   10.73(In.)
Flow top width inside pipe =   13.53(In.)
Critical depth could not be calculated.
Pipe flow velocity =     14.93(Ft/s)
Travel time through pipe =    0.07 min.
Time of concentration (TC) =     9.73 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      399.000 to Point/Station      399.000
**** CONFLUENCE OF MAIN STREAMS ****
----------------------------------------------------------------------
The following data inside Main Stream is listed:
In Main Stream number: 2
Stream flow area =      5.800(Ac.)
Runoff from this stream =     14.028(CFS)
```

```
Time of concentration =    9.73 min.
Rainfall intensity =     2.731(In/Hr)
Program is now starting with Main Stream No. 3


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      306.000 to Point/Station      307.000
**** INITIAL AREA EVALUATION ****
________________________________________________________________________
Initial area flow distance =   200.000(Ft.)
Top (of initial area) elevation =  1446.600(Ft.)
Bottom (of initial area) elevation =  1443.300(Ft.)
Difference in elevation =     3.300(Ft.)
Slope =    0.01650  s(percent)=       1.65
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    5.676 min.
Rainfall intensity =      3.557(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.882
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.670
Decimal fraction soil group C = 0.330
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  60.29
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =     12.550(CFS)
Total initial stream area =        4.000(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      307.000 to Point/Station      399.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1439.300(Ft.)
Downstream point/station elevation =  1434.750(Ft.)
Pipe length  =   558.10(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =    12.550(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =    12.550(CFS)
Normal flow depth in pipe =   15.26(In.)
Flow top width inside pipe =   18.72(In.)
Critical Depth =   15.83(In.)
Pipe flow velocity =      6.71(Ft/s)
Travel time through pipe =    1.39 min.
Time of concentration (TC) =     7.06 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      399.000 to Point/Station      399.000
```

```
**** CONFLUENCE OF MAIN STREAMS ****
_____________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 3
Stream flow area =      4.000(Ac.)
Runoff from this stream =     12.550(CFS)
Time of concentration =    7.06 min.
Rainfall intensity =     3.195(In/Hr)
Program is now starting with Main Stream No. 4


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      308.000 to Point/Station      309.000
**** INITIAL AREA EVALUATION ****
_____________________________________________________________________
Initial area flow distance =   402.000(Ft.)
Top (of initial area) elevation =  1445.500(Ft.)
Bottom (of initial area) elevation =  1443.000(Ft.)
Difference in elevation =     2.500(Ft.)
Slope =    0.00622  s(percent)=       0.62
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    9.122 min.
Rainfall intensity =      2.819(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.876
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      8.639(CFS)
Total initial stream area =        3.500(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      309.000 to Point/Station      399.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
_____________________________________________________________________
Upstream point/station elevation =  1439.000(Ft.)
Downstream point/station elevation =  1434.750(Ft.)
Pipe length  =    56.57(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     8.639(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     8.639(CFS)
Normal flow depth in pipe =    8.78(In.)
Flow top width inside pipe =   10.64(In.)
Critical depth could not be calculated.
Pipe flow velocity =     14.04(Ft/s)
```

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Travel time through pipe =    0.07 min.
Time of concentration (TC) =     9.19 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      399.000 to Point/Station      399.000
**** CONFLUENCE OF MAIN STREAMS ****
______________________________________________________________________________
The following data inside Main Stream is listed:
In Main Stream number: 4
Stream flow area =      3.500(Ac.)
Runoff from this stream =      8.639(CFS)
Time of concentration =    9.19 min.
Rainfall intensity =     2.809(In/Hr)
Program is now starting with Main Stream No. 5


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      310.000 to Point/Station      311.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   336.000(Ft.)
Top (of initial area) elevation =  1446.700(Ft.)
Bottom (of initial area) elevation =  1444.100(Ft.)
Difference in elevation =     2.600(Ft.)
Slope =    0.00774  s(percent)=       0.77
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.127 min.
Rainfall intensity =      2.983(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.877
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      2.615(CFS)
Total initial stream area =        1.000(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      311.000 to Point/Station      314.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
Upstream point/station elevation =  1440.100(Ft.)
Downstream point/station elevation =  1437.800(Ft.)
Pipe length  =   278.80(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.615(CFS)
```

```
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     2.615(CFS)
Normal flow depth in pipe =    8.18(In.)
Flow top width inside pipe =   11.18(In.)
Critical Depth =    8.32(In.)
Pipe flow velocity =      4.59(Ft/s)
Travel time through pipe =    1.01 min.
Time of concentration (TC) =     9.14 min.


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Process from Point/Station      314.000 to Point/Station      314.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 5 in normal stream number 1
Stream flow area =      1.000(Ac.)
Runoff from this stream =      2.615(CFS)
Time of concentration =    9.14 min.
Rainfall intensity =     2.816(In/Hr)


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Process from Point/Station      312.000 to Point/Station      313.000
**** INITIAL AREA EVALUATION ****
______________________________________________________________________________
Initial area flow distance =   258.000(Ft.)
Top (of initial area) elevation =  1447.200(Ft.)
Bottom (of initial area) elevation =  1445.100(Ft.)
Difference in elevation =     2.100(Ft.)
Slope =    0.00814  s(percent)=       0.81
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.239 min.
Rainfall intensity =      3.157(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.884
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.200
Decimal fraction soil group C = 0.800
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  66.40
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      2.233(CFS)
Total initial stream area =        0.800(Ac.)
Pervious area fraction = 0.100


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Process from Point/Station      313.000 to Point/Station      314.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
______________________________________________________________________________
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```
Upstream point/station elevation =  1440.000(Ft.)
Downstream point/station elevation =  1437.800(Ft.)
Pipe length  =    24.50(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.233(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     2.233(CFS)
Normal flow depth in pipe =    4.24(In.)
Flow top width inside pipe =    8.98(In.)
Critical Depth =    8.03(In.)
Pipe flow velocity =     10.93(Ft/s)
Travel time through pipe =    0.04 min.
Time of concentration (TC) =     7.28 min.


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Process from Point/Station      314.000 to Point/Station      314.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 5 in normal stream number 2
Stream flow area =      0.800(Ac.)
Runoff from this stream =      2.233(CFS)
Time of concentration =    7.28 min.
Rainfall intensity =     3.149(In/Hr)
Summary of stream data:

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


1        2.615      9.14                2.816
2        2.233      7.28                3.149
Largest stream flow has longer time of concentration
Qp =      2.615 + sum of
          Qb         Ia/Ib
           2.233 *    0.894 =      1.997
Qp =      4.612

Total of 2 streams to confluence:
Flow rates before confluence point:
       2.615       2.233
Area of streams before confluence:
        1.000        0.800
Results of confluence:
Total flow rate =      4.612(CFS)
Time of concentration =     9.140 min.
Effective stream area after confluence =      1.800(Ac.)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      314.000 to Point/Station      399.000
```

**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 1437.800(Ft.)
Downstream point/station elevation = 1434.750(Ft.)
Pipe length = 758.50(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 4.612(CFS)
Nearest computed pipe diameter = 18.00(In.)
Calculated individual pipe flow = 4.612(CFS)
Normal flow depth in pipe = 11.02(In.)
Flow top width inside pipe = 17.54(In.)
Critical Depth = 9.89(In.)
Pipe flow velocity = 4.07(Ft/s)
Travel time through pipe = 3.11 min.
Time of concentration (TC) = 12.25 min.

++
Process from Point/Station 399.000 to Point/Station 399.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:
In Main Stream number: 5
Stream flow area = 1.800(Ac.)
Runoff from this stream = 4.612(CFS)
Time of concentration = 12.25 min.
Rainfall intensity = 2.440(In/Hr)
Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	10.098	9.31	2.791
2	14.028	9.73	2.731
3	12.550	7.06	3.195
4	8.639	9.19	2.809
5	4.612	12.25	2.440

Largest stream flow has longer or shorter time of concentration
Qp = 14.028 + sum of

Qb	Ia/Ib		
10.098	*	0.978	= 9.878
Qb	**Ia/Ib**		
12.550	*	0.855	= 10.724
Qb	**Ia/Ib**		
8.639	*	0.972	= 8.398
Qa	**Tb/Ta**		
4.612	*	0.795	= 3.665

Qp = 46.694

Total of 5 main streams to confluence:

Flow rates before confluence point:
10.098 14.028 12.550 8.639 4.612
Area of streams before confluence:
4.000 5.800 4.000 3.500 1.800

Results of confluence:
Total flow rate = 46.694(CFS)
Time of concentration = 9.734 min.
Effective stream area after confluence = 19.100(Ac.)
End of computations, total study area = 19.10 (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 = 62.8

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software,(c) 1989 - 2005 Version 7.1
Rational Hydrology Study Date: 06/27/23 File:400W.out

REDLANDS WEST- 400 SERIES (REDLANDS AVE)
100-YEAR STORM EVENT
20-0186 - DEVELOPED CONDITION
2023-06-27 WG

********* 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 [Perris Valley] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.780(In/Hr)
100 year storm 10 minute intensity = 2.690(In/Hr)
100 year storm 60 minute intensity = 1.120(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.120(In/Hr)
Slope of intensity duration curve = 0.4900

++
Process from Point/Station 410.000 to Point/Station 411.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 380.000(Ft.)
Top (of initial area) elevation = 1447.000(Ft.)
Bottom (of initial area) elevation = 1444.600(Ft.)

```
Difference in elevation =     2.400(Ft.)
Slope =    0.00632  s(percent)=       0.63
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    8.891 min.
Rainfall intensity =      2.854(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.876
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      2.000(CFS)
Total initial stream area =        0.800(Ac.)
Pervious area fraction = 0.100


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      411.000 to Point/Station      450.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1440.400(Ft.)
Downstream point/station elevation =  1440.200(Ft.)
Pipe length  =    60.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     2.000(CFS)
Nearest computed pipe diameter  =     12.00(In.)
Calculated individual pipe flow  =     2.000(CFS)
Normal flow depth in pipe =    9.55(In.)
Flow top width inside pipe =    9.67(In.)
Critical Depth =    7.25(In.)
Pipe flow velocity =      2.98(Ft/s)
Travel time through pipe =    0.34 min.
Time of concentration (TC) =     9.23 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      450.000 to Point/Station      450.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      0.800(Ac.)
Runoff from this stream =      2.000(CFS)
Time of concentration =    9.23 min.
Rainfall intensity =     2.803(In/Hr)


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Process from Point/Station      501.000 to Point/Station      450.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****
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```
Rainfall intensity =      2.535(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.874
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  56.00
Pervious area fraction =  0.100; Impervious fraction =  0.900
User specified values are as follows:
TC =  11.33 min.  Rain intensity =       2.53(In/Hr)
Total area =         1.00(Ac.)  Total runoff =      1.54(CFS)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      450.000 to Point/Station      450.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      1.000(Ac.)
Runoff from this stream =      1.545(CFS)
Time of concentration =   11.33 min.
Rainfall intensity =     2.535(In/Hr)
Summary of stream data:

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


1        2.000      9.23                 2.803
2        1.545     11.33                 2.535
Largest stream flow has longer or shorter time of concentration
Qp =      2.000 + sum of
          Qa          Tb/Ta
           1.545 *    0.814 =      1.258
Qp =      3.258

Total of 2 streams to confluence:
Flow rates before confluence point:
       2.000       1.545
Area of streams before confluence:
        0.800        1.000
Results of confluence:
Total flow rate =      3.258(CFS)
Time of concentration =     9.226 min.
Effective stream area after confluence =      1.800(Ac.)


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Process from Point/Station      450.000 to Point/Station      455.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
Upstream point/station elevation =  1440.200(Ft.)
Downstream point/station elevation =  1439.900(Ft.)
Pipe length  =   210.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     3.258(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     3.258(CFS)
Normal flow depth in pipe =   12.41(In.)
Flow top width inside pipe =   16.66(In.)
Critical Depth =    8.25(In.)
Pipe flow velocity =      2.51(Ft/s)
Travel time through pipe =    1.40 min.
Time of concentration (TC) =    10.62 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      455.000 to Point/Station      455.000
**** CONFLUENCE OF MINOR STREAMS ****
------------------------------------------------------------------------
Along Main Stream number: 1 in normal stream number 1
Stream flow area =      1.800(Ac.)
Runoff from this stream =      3.258(CFS)
Time of concentration =   10.62 min.
Rainfall intensity =     2.616(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      299.100 to Point/Station      299.100
**** USER DEFINED FLOW INFORMATION AT A POINT ****
------------------------------------------------------------------------
Rainfall intensity =      1.952(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.870
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.900
Decimal fraction soil group C = 0.100
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  57.30
Pervious area fraction =  0.100; Impervious fraction =  0.900
User specified values are as follows:
TC =  19.30 min.  Rain intensity =       1.95(In/Hr)
Total area =        11.70(Ac.)  Total runoff =      5.00(CFS)


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Process from Point/Station      299.100 to Point/Station      455.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
------------------------------------------------------------------------
```

```
Upstream point/station elevation =  1440.400(Ft.)
Downstream point/station elevation =  1439.900(Ft.)
Pipe length  =   110.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     5.000(CFS)
Nearest computed pipe diameter  =     18.00(In.)
Calculated individual pipe flow  =     5.000(CFS)
Normal flow depth in pipe =   11.16(In.)
Flow top width inside pipe =   17.48(In.)
Critical Depth =   10.32(In.)
Pipe flow velocity =      4.34(Ft/s)
Travel time through pipe =    0.42 min.
Time of concentration (TC) =    19.72 min.


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Process from Point/Station      455.000 to Point/Station      455.000
**** CONFLUENCE OF MINOR STREAMS ****
______________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =     11.700(Ac.)
Runoff from this stream =      5.000(CFS)
Time of concentration =   19.72 min.
Rainfall intensity =     1.932(In/Hr)
Summary of stream data:

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


1        3.258     10.62                2.616
2        5.000     19.72                1.932
Largest stream flow has longer time of concentration
Qp =      5.000 + sum of
          Qb         Ia/Ib
           3.258 *    0.738 =      2.406
Qp =      7.406

Total of 2 streams to confluence:
Flow rates before confluence point:
       3.258       5.000
Area of streams before confluence:
        1.800       11.700
Results of confluence:
Total flow rate =      7.406(CFS)
Time of concentration =    19.722 min.
Effective stream area after confluence =     13.500(Ac.)


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Process from Point/Station      455.000 to Point/Station      460.000
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**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
_____________________________________________________________________
Upstream point/station elevation =  1439.900(Ft.)
Downstream point/station elevation =  1439.500(Ft.)
Pipe length  =   135.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     7.406(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =     7.406(CFS)
Normal flow depth in pipe =   15.00(In.)
Flow top width inside pipe =   18.97(In.)
Critical Depth =   12.09(In.)
Pipe flow velocity =      4.03(Ft/s)
Travel time through pipe =    0.56 min.
Time of concentration (TC) =    20.28 min.


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Process from Point/Station      460.000 to Point/Station      460.000
**** CONFLUENCE OF MINOR STREAMS ****
_____________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     13.500(Ac.)
Runoff from this stream =      7.406(CFS)
Time of concentration =   20.28 min.
Rainfall intensity =     1.906(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      412.000 to Point/Station      413.000
**** INITIAL AREA EVALUATION ****
_____________________________________________________________________
Initial area flow distance =   250.000(Ft.)
Top (of initial area) elevation =  1447.300(Ft.)
Bottom (of initial area) elevation =  1445.500(Ft.)
Difference in elevation =     1.800(Ft.)
Slope =    0.00720  s(percent)=       0.72
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration =    7.325 min.
Rainfall intensity =      3.139(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.882
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  62.50
Pervious area fraction =  0.100; Impervious fraction =  0.900
Initial subarea runoff =      1.107(CFS)
Total initial stream area =        0.400(Ac.)
Pervious area fraction = 0.100
```

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Process from Point/Station      413.000 to Point/Station      460.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1439.100(Ft.)
Downstream point/station elevation =  1439.500(Ft.)
Pipe length  =    40.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     1.107(CFS)
Nearest computed pipe diameter  =      9.00(In.)
Calculated individual pipe flow  =     1.107(CFS)
Normal flow depth in pipe =    5.38(In.)
Flow top width inside pipe =    8.82(In.)
Critical Depth =    5.80(In.)
Pipe flow velocity =      4.01(Ft/s)
Travel time through pipe =    0.17 min.
Time of concentration (TC) =     7.49 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      460.000 to Point/Station      460.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =      0.400(Ac.)
Runoff from this stream =      1.107(CFS)
Time of concentration =    7.49 min.
Rainfall intensity =     3.104(In/Hr)
Summary of stream data:

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


1        7.406     20.28                1.906
2        1.107      7.49                3.104
Largest stream flow has longer time of concentration
Qp =      7.406 + sum of
          Qb         Ia/Ib
           1.107 *    0.614 =      0.680
Qp =      8.085

Total of 2 streams to confluence:
Flow rates before confluence point:
       7.406       1.107
Area of streams before confluence:
       13.500        0.400
Results of confluence:
Total flow rate =      8.085(CFS)
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```
Time of concentration =    20.280 min.
Effective stream area after confluence =     13.900(Ac.)


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Process from Point/Station      460.000 to Point/Station      465.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1439.500(Ft.)
Downstream point/station elevation =  1438.800(Ft.)
Pipe length  =   240.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     8.085(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =     8.085(CFS)
Normal flow depth in pipe =   16.27(In.)
Flow top width inside pipe =   17.55(In.)
Critical Depth =   12.65(In.)
Pipe flow velocity =      4.05(Ft/s)
Travel time through pipe =    0.99 min.
Time of concentration (TC) =    21.27 min.


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Process from Point/Station      465.000 to Point/Station      465.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 1
Stream flow area =     13.900(Ac.)
Runoff from this stream =      8.085(CFS)
Time of concentration =   21.27 min.
Rainfall intensity =     1.862(In/Hr)


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      399.000 to Point/Station      399.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****
________________________________________________________________________
Rainfall intensity =      2.289(In/Hr) for a   100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.877
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.500
Decimal fraction soil group C = 0.500
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2)  =  62.50
Pervious area fraction =  0.100; Impervious fraction =  0.900
User specified values are as follows:
TC =  13.95 min.  Rain intensity =       2.29(In/Hr)
Total area =        18.90(Ac.)  Total runoff =      9.00(CFS)
```

```
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      399.000 to Point/Station      465.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****
________________________________________________________________________
Upstream point/station elevation =  1441.000(Ft.)
Downstream point/station elevation =  1438.800(Ft.)
Pipe length  =   700.00(Ft.)   Manning's N = 0.013
No. of pipes = 1  Required pipe flow  =     9.000(CFS)
Nearest computed pipe diameter  =     21.00(In.)
Calculated individual pipe flow  =     9.000(CFS)
Normal flow depth in pipe =   17.48(In.)
Flow top width inside pipe =   15.68(In.)
Critical Depth =   13.37(In.)
Pipe flow velocity =      4.21(Ft/s)
Travel time through pipe =    2.77 min.
Time of concentration (TC) =    16.72 min.


++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Process from Point/Station      465.000 to Point/Station      465.000
**** CONFLUENCE OF MINOR STREAMS ****
________________________________________________________________________
Along Main Stream number: 1 in normal stream number 2
Stream flow area =     18.900(Ac.)
Runoff from this stream =      9.000(CFS)
Time of concentration =   16.72 min.
Rainfall intensity =     2.094(In/Hr)
Summary of stream data:

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


1        8.085     21.27                1.862
2        9.000     16.72                2.094
Largest stream flow has longer or shorter time of concentration
Qp =      9.000 + sum of
          Qa          Tb/Ta
           8.085 *    0.786 =      6.358
Qp =     15.358

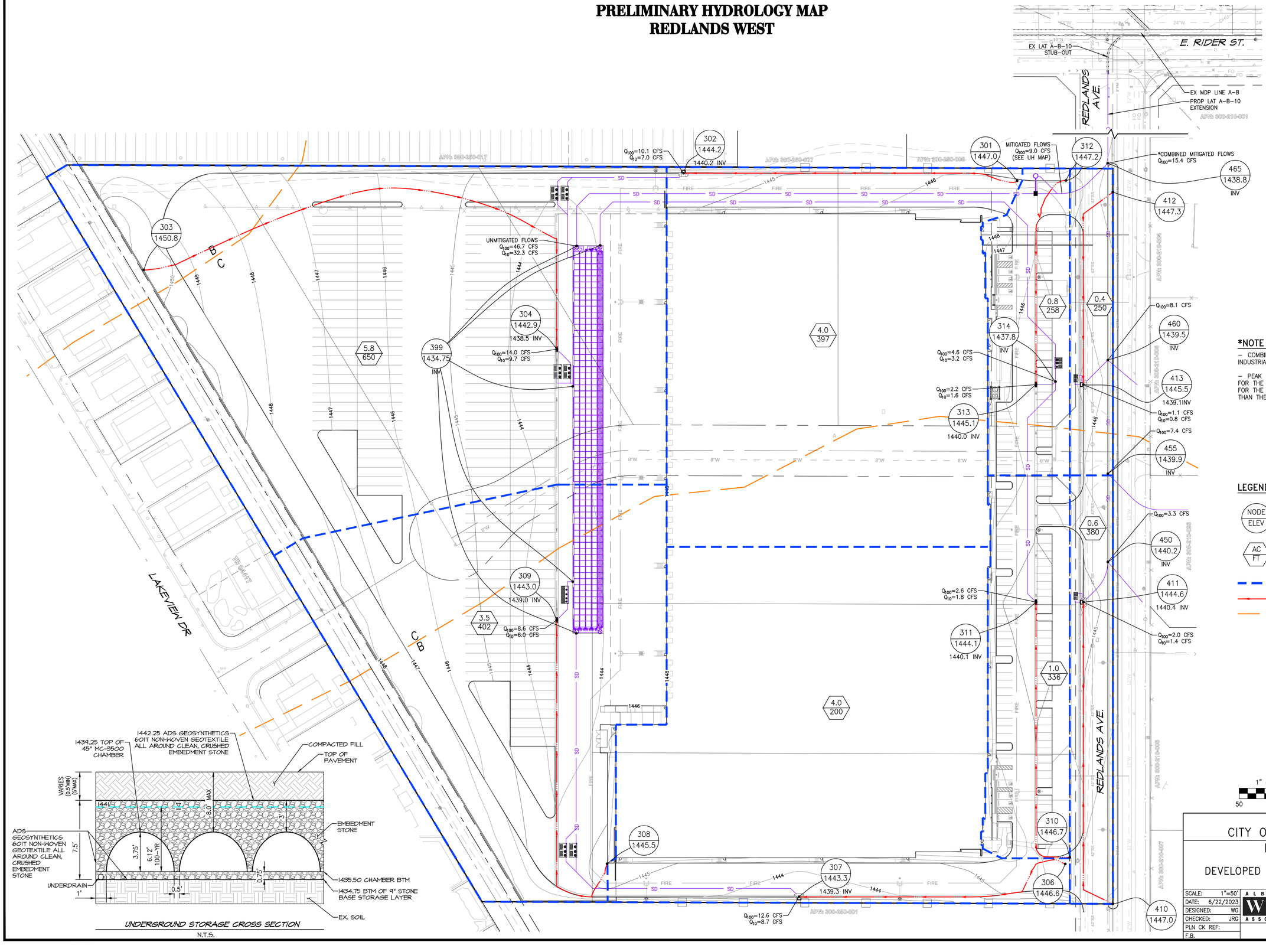
Total of 2 streams to confluence:
Flow rates before confluence point:
       8.085       9.000
Area of streams before confluence:
       13.900       18.900
Results of confluence:
Total flow rate =     15.358(CFS)
Time of concentration =    16.724 min.
```

Effective stream area after confluence = 32.800(Ac.)
End of computations, total study area = 32.80 (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 = 60.3

RATIONAL METHOD HYDROLOGY MAPS

PRELIMINARY HYDROLOGY MAP
REDLANDS WEST



UNDERGROUND STORAGE CROSS SECTION

N.T.S.

*NOTE

– COMBINED MITIGATED FLOW RATE INCLUDES REDLANDS EAST INDUSTRIAL DEVELOPMENT

– PEAK MITIGATED FLOW RATES HAVE BEEN CALCULATED ONLY FOR THE 100–YEAR STORM EVENT. PEAK MITIGATED FLOW RATES FOR THE 10–YEAR STORM EVENT WILL BE CONSIDERABLY LOWER THAN THE 100–YEAR PEAK MITIGATED FLOW RATES.

LEGEND

- NODE / ELEV – NODE NUMBER / ELEVATION (FT)
- AC / FT – AREA (AC) / LENGTH (FT)
- DRAINAGE AREA BOUNDARY (PROPOSED)
- FLOWLINE (PROPOSED)
- NRCS SOIL BOUNDARY

N W E S WEBB

1" = 50'

50 0 50 100 150

CITY OF PERRIS, CALIFORNIA

REDLANDS WEST

DEVELOPED CONDITION RATIONAL METHOD HYDROLOGY MAP

SCALE:	1"=50'	ALBERT A. WEBB ASSOCIATES	W.O. 20-0186
DATE:	6/22/2023	ENGINEERING CONSULTANTS 3788 McCRAY STREET RIVERSIDE CA. 92506 PH. (951) 686-1070 FAX (951) 788-1256	SHEET 1 OF 1 SHEETS
DESIGNED:	WG		
CHECKED:	JRG		DWG. NO.
PLN CK REF:			
F.B.			

H:\2020\20-0186\DRAINAGE\PHYD\DWG FOLDER\20-0186-C-RATIONAL METHOD MAPS.DWG 7/13/2023 4:32:18 PM

APPENDIX B – HYDRAULIC ANALYSIS

Hydraulic calculations to be provided in Final Engineering.

APPENDIX C – UNIT HYDROGRAPH / ROUTING ANALYSIS

PROPOSED CONDITION 100-YEAR, 1/3/6/24-HOUR UNIT HYDROGRAPHS

DEVELOPED CONDITION									
Cover Type	**Condition (Poor,Fair,Good)**	**Soil Type (A,B,C,D)**	**COVER TYPE**	**RI**	**Land Use**	**% Impervious**	**Area (SF)**	**Area (Acre)**	**Impervious Area (SF)**
Urban	Good	B	RESIDENTIAL OR COMMERCIAL	56	Streets/Conc	0.9	165244	3.79	148720
Urban	Good	B	RESIDENTIAL OR COMMERCIAL	56	Roof	0.9	191447	4.40	172302
Urban	Good	B	RESIDENTIAL OR COMMERCIAL	56	Landscape	0	80318	1.84	0
Urban	Good	C	RESIDENTIAL OR COMMERCIAL	69	Streets/Conc	0.9	266630	6.12	239967
Urban	Good	C	RESIDENTIAL OR COMMERCIAL	69	Roof	0.9	105592	2.42	95033
Urban	Good	C	RESIDENTIAL OR COMMERCIAL	69	Landscape	0	68078	1.56	0
			AVERAGE WEIGHTED RI VALUE	**62.5**		**TOTAL**	877309	20.1	656022
						TOTAL % IMPERVIOUS			**75%**
						LOW LOSS RATE			**0.30**

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

Study date 06/26/23 File: PROPWEST1001100.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

REDLANDS WEST - DEVELOPED CONDITION
100-YEAR STORM EVENT
20-0186 WEST INDUSTRIAL PROJECT
06/26/2023 WG

Drainage Area = 20.10(Ac.) = 0.031 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 20.10(Ac.) = 0.031 Sq. Mi.
Length along longest watercourse = 1372.00(Ft.)
Length along longest watercourse measured to centroid = 918.00(Ft.)
Length along longest watercourse = 0.260 Mi.
Length along longest watercourse measured to centroid = 0.174 Mi.
Difference in elevation = 11.85(Ft.)
Slope along watercourse = 45.6035 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.054 Hr.
Lag time = 3.22 Min.
25% of lag time = 0.81 Min.
40% of lag time = 1.29 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]
20.10	0.45	9.05

100 YEAR Area rainfall data:

```
Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       20.10            1.20                  24.12

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    0.450(In)
Area Averaged 100-Year Rainfall =    1.200(In)

Point rain (area averaged) =    1.200(In)
Areal adjustment factor =   99.98 %
Adjusted average point rain =    1.200(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    20.100           62.50         0.760
 Total Area Entered =     20.10(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
62.5  62.5      0.443     0.760        0.140       1.000      0.140
                                                 Sum (F) =   0.140
Area averaged mean soil loss (F) (In/Hr) =  0.140
Minimum soil loss rate ((In/Hr)) =  0.070
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.290
------------------------------------------------------------------------
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        155.186         34.407              6.970
    2   0.167        310.372         46.627              9.445
    3   0.250        465.558         10.888              2.206
    4   0.333        620.745          4.727              0.958
    5   0.417        775.931          2.324              0.471
    6   0.500        931.117          1.028              0.208
                               Sum = 100.000   Sum=      20.257
------------------------------------------------------------------------


 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   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
    1   0.08     4.20      0.605          0.140    (  0.175)        0.465
    2   0.17     4.30      0.619          0.140    (  0.180)        0.479
```

```
  3   0.25     5.00      0.720          0.140    (  0.209)        0.580
  4   0.33     5.00      0.720          0.140    (  0.209)        0.580
  5   0.42     5.80      0.835          0.140    (  0.242)        0.695
  6   0.50     6.50      0.936          0.140    (  0.271)        0.796
  7   0.58     7.40      1.065          0.140    (  0.309)        0.925
  8   0.67     8.60      1.238          0.140    (  0.359)        1.098
  9   0.75    12.30      1.771          0.140    (  0.514)        1.631
 10   0.83    29.10      4.190          0.140    (  1.215)        4.050
 11   0.92     6.80      0.979          0.140    (  0.284)        0.839
 12   1.00     5.00      0.720          0.140    (  0.209)        0.580
               (Loss Rate Not Used)
    Sum =     100.0                                  Sum =    12.7
       Flood volume = Effective rainfall      1.06(In)
        times area      20.1(Ac.)/[(In)/(Ft.)] =       1.8(Ac.Ft)
       Total soil loss =      0.14(In)
       Total soil loss =     0.234(Ac.Ft)
       Total rainfall =      1.20(In)
       Flood volume =       77325.7 Cubic Feet
       Total soil loss =       10213.9 Cubic Feet
       ---------------------------------------------------------------------
        Peak flow rate of this hydrograph =     49.373(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       12.5      25.0      37.5      50.0
  ---------------------------------------------------------------------
    0+ 5       0.0223      3.24  V Q       |         |         |         |
    0+10       0.0756      7.73  |V    Q   |         |         |         |
    0+15       0.1417      9.60  |  V   Q  |         |         |         |
    0+20       0.2176     11.03  |   V   Q |         |         |         |
    0+25       0.3022     12.28  |     V  Q|         |         |         |
    0+30       0.4005     14.28  |        V|Q        |         |         |
    0+35       0.5137     16.44  |         |V Q      |         |         |
    0+40       0.6461     19.22  |         |   VQ    |         |         |
    0+45       0.8183     25.00  |         |       V Q         |         |
    0+50       1.1453     47.48  |         |         |    V    |      Q  |
    0+55       1.4853     49.37  |         |         |         |  V     Q|
    1+ 0       1.6450     23.18  |         |       Q |         |      V  |
    1+ 5       1.7291     12.21  |        Q|         |         |       V |
    1+10       1.7589      4.33  |  Q      |         |         |        V|
    1+15       1.7712      1.79  |Q        |         |         |        V|
    1+20       1.7743      0.45  Q         |         |         |        V|
    1+25       1.7752      0.12  Q         |         |         |         V
---------------------------------------------------------------------
```

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

Study date 06/26/23 File: PROPWEST1003100.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

REDLANDS WEST - DEVELOPED CONDITION
100-YEAR STORM EVENT
20-0186 WEST INDUSTRIAL PROJECT
06/26/2023 WG

Drainage Area = 20.10(Ac.) = 0.031 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 20.10(Ac.) = 0.031 Sq. Mi.
Length along longest watercourse = 1372.00(Ft.)
Length along longest watercourse measured to centroid = 918.00(Ft.)
Length along longest watercourse = 0.260 Mi.
Length along longest watercourse measured to centroid = 0.174 Mi.
Difference in elevation = 11.85(Ft.)
Slope along watercourse = 45.6035 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.054 Hr.
Lag time = 3.22 Min.
25% of lag time = 0.81 Min.
40% of lag time = 1.29 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]
20.10	0.80	16.08

100 YEAR Area rainfall data:

```
Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       20.10            1.90                  38.19

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 =   99.99 %
Adjusted average point rain =    1.900(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    20.100           62.50         0.760
 Total Area Entered =     20.10(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
62.5  62.5      0.443     0.760        0.140       1.000      0.140
                                                 Sum (F) =   0.140
Area averaged mean soil loss (F) (In/Hr) =  0.140
Minimum soil loss rate ((In/Hr)) =  0.070
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.290
------------------------------------------------------------------------

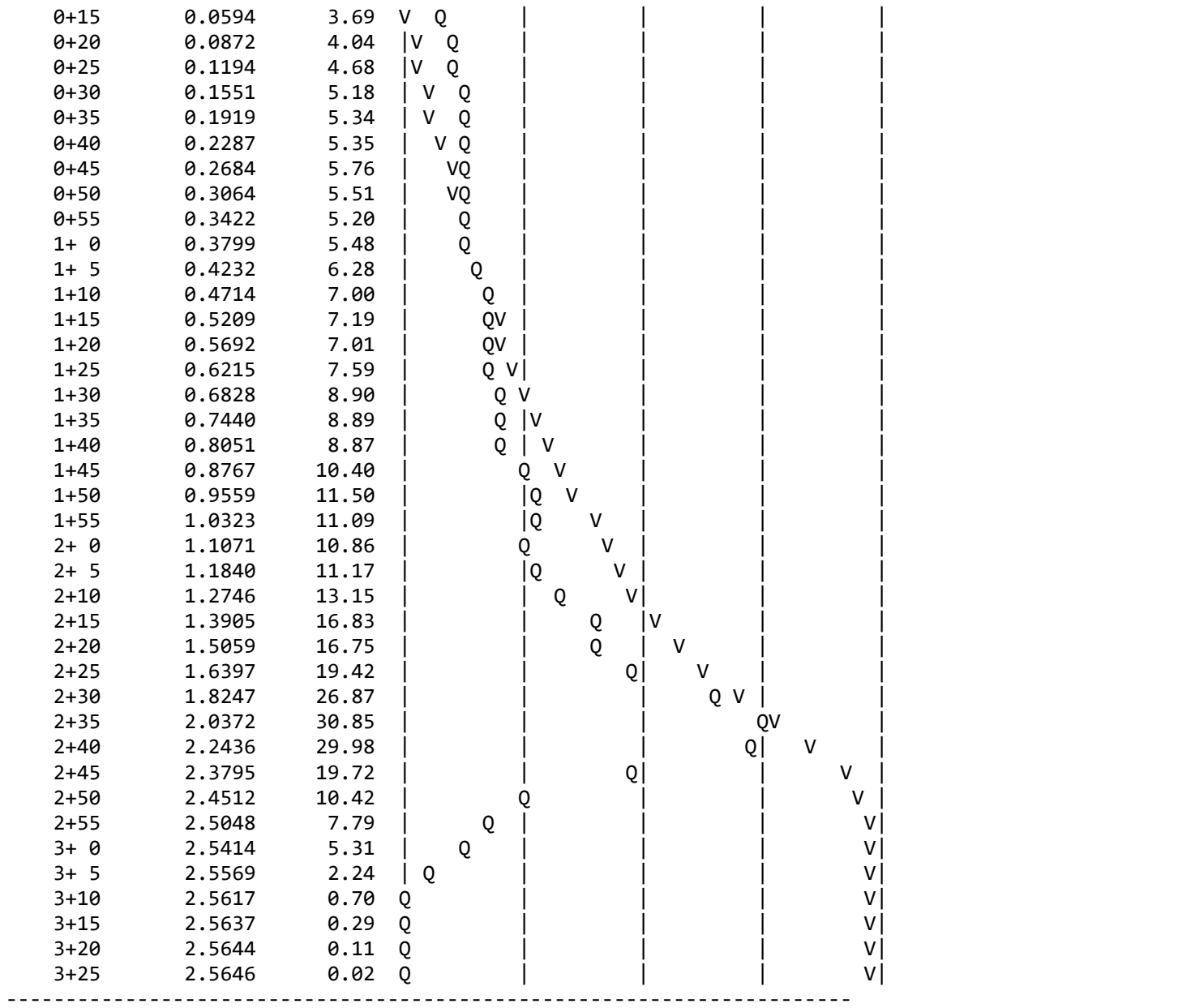
               U n i t  H y d r o g r a p h
                       VALLEY S-Curve
------------------------------------------------------------------------
               Unit Hydrograph Data
------------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                          Graph %            (CFS)
------------------------------------------------------------------------
    1   0.083        155.186         34.407              6.970
    2   0.167        310.372         46.627              9.445
    3   0.250        465.558         10.888              2.206
    4   0.333        620.745          4.727              0.958
    5   0.417        775.931          2.324              0.471
    6   0.500        931.117          1.028              0.208
                              Sum = 100.000   Sum=      20.257
------------------------------------------------------------------------

 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   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
    1   0.08     1.30      0.296       (  0.140)       0.086        0.210
    2   0.17     1.30      0.296       (  0.140)       0.086        0.210
    3   0.25     1.10      0.251       (  0.140)       0.073        0.178
    4   0.33     1.50      0.342       (  0.140)       0.099        0.243
```

```
 5   0.42     1.50      0.342       (  0.140)       0.099        0.243
 6   0.50     1.80      0.410       (  0.140)       0.119        0.291
 7   0.58     1.50      0.342       (  0.140)       0.099        0.243
 8   0.67     1.80      0.410       (  0.140)       0.119        0.291
 9   0.75     1.80      0.410       (  0.140)       0.119        0.291
10   0.83     1.50      0.342       (  0.140)       0.099        0.243
11   0.92     1.60      0.365       (  0.140)       0.106        0.259
12   1.00     1.80      0.410       (  0.140)       0.119        0.291
13   1.08     2.20      0.502          0.140    (  0.145)        0.362
14   1.17     2.20      0.502          0.140    (  0.145)        0.362
15   1.25     2.20      0.502          0.140    (  0.145)        0.362
16   1.33     2.00      0.456       (  0.140)       0.132        0.324
17   1.42     2.60      0.593          0.140    (  0.172)        0.453
18   1.50     2.70      0.616          0.140    (  0.179)        0.476
19   1.58     2.40      0.547          0.140    (  0.159)        0.407
20   1.67     2.70      0.616          0.140    (  0.179)        0.476
21   1.75     3.30      0.752          0.140    (  0.218)        0.612
22   1.83     3.10      0.707          0.140    (  0.205)        0.567
23   1.92     2.90      0.661          0.140    (  0.192)        0.521
24   2.00     3.00      0.684          0.140    (  0.198)        0.544
25   2.08     3.10      0.707          0.140    (  0.205)        0.567
26   2.17     4.20      0.958          0.140    (  0.278)        0.818
27   2.25     5.00      1.140          0.140    (  0.331)        1.000
28   2.33     3.50      0.798          0.140    (  0.231)        0.658
29   2.42     6.80      1.550          0.140    (  0.450)        1.410
30   2.50     7.30      1.664          0.140    (  0.483)        1.524
31   2.58     8.20      1.869          0.140    (  0.542)        1.729
32   2.67     5.90      1.345          0.140    (  0.390)        1.205
33   2.75     2.00      0.456       (  0.140)       0.132        0.324
34   2.83     1.80      0.410       (  0.140)       0.119        0.291
35   2.92     1.80      0.410       (  0.140)       0.119        0.291
36   3.00     0.60      0.137       (  0.140)       0.040        0.097
               (Loss Rate Not Used)
   Sum =     100.0                                    Sum =    18.4
      Flood volume = Effective rainfall      1.53(In)
       times area      20.1(Ac.)/[(In)/(Ft.)] =       2.6(Ac.Ft)
      Total soil loss =      0.37(In)
      Total soil loss =     0.618(Ac.Ft)
      Total rainfall =      1.90(In)
      Flood volume =      111712.3 Cubic Feet
      Total soil loss =       26905.2 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     30.848(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       10.0      20.0      30.0      40.0
-------------------------------------------------------------------------
  0+ 5       0.0101      1.47  VQ        |         |         |         |
  0+10       0.0339      3.46  V  Q      |         |         |         |
```



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

Study date 06/26/23 File: PROPWEST1006100.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

REDLANDS WEST - DEVELOPED CONDITION
100-YEAR STORM EVENT
20-0186 WEST INDUSTRIAL PROJECT
06/26/2023 WG

Drainage Area = 20.10(Ac.) = 0.031 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 20.10(Ac.) = 0.031 Sq. Mi.
Length along longest watercourse = 1372.00(Ft.)
Length along longest watercourse measured to centroid = 918.00(Ft.)
Length along longest watercourse = 0.260 Mi.
Length along longest watercourse measured to centroid = 0.174 Mi.
Difference in elevation = 11.85(Ft.)
Slope along watercourse = 45.6035 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.054 Hr.
Lag time = 3.22 Min.
25% of lag time = 0.81 Min.
40% of lag time = 1.29 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]
20.10	1.00	20.10

100 YEAR Area rainfall data:

```
Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       20.10            2.50                  50.25

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 =   99.99 %
Adjusted average point rain =    2.500(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    20.100           62.50         0.760
 Total Area Entered =     20.10(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
62.5  62.5      0.443     0.760        0.140       1.000      0.140
                                                 Sum (F) =   0.140
Area averaged mean soil loss (F) (In/Hr) =  0.140
Minimum soil loss rate ((In/Hr)) =  0.070
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.290
------------------------------------------------------------------------

               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        155.186         34.407              6.970
    2   0.167        310.372         46.627              9.445
    3   0.250        465.558         10.888              2.206
    4   0.333        620.745          4.727              0.958
    5   0.417        775.931          2.324              0.471
    6   0.500        931.117          1.028              0.208
                              Sum = 100.000   Sum=      20.257
------------------------------------------------------------------------

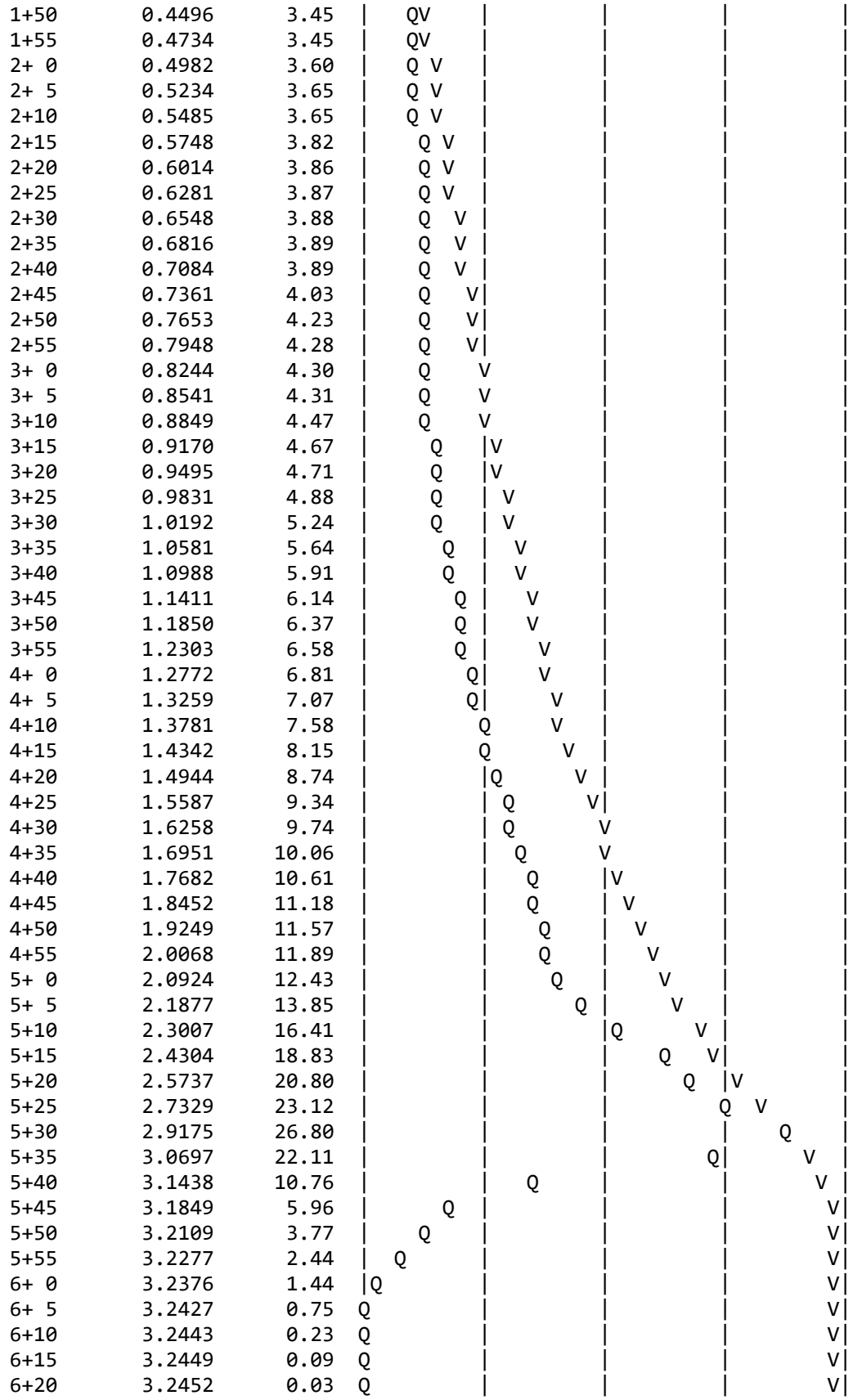
 The following loss rate calculations reflect use of the minimum calculated loss
 rate subtracted from the Storm Rain to produce the maximum Effective Rain value

  Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
    1   0.08     0.50      0.150       (  0.140)       0.043        0.106
    2   0.17     0.60      0.180       (  0.140)       0.052        0.128
    3   0.25     0.60      0.180       (  0.140)       0.052        0.128
    4   0.33     0.60      0.180       (  0.140)       0.052        0.128
```

5	0.42	0.60	0.180	(0.140)	0.052	0.128
6	0.50	0.70	0.210	(0.140)	0.061	0.149
7	0.58	0.70	0.210	(0.140)	0.061	0.149
8	0.67	0.70	0.210	(0.140)	0.061	0.149
9	0.75	0.70	0.210	(0.140)	0.061	0.149
10	0.83	0.70	0.210	(0.140)	0.061	0.149
11	0.92	0.70	0.210	(0.140)	0.061	0.149
12	1.00	0.80	0.240	(0.140)	0.070	0.170
13	1.08	0.80	0.240	(0.140)	0.070	0.170
14	1.17	0.80	0.240	(0.140)	0.070	0.170
15	1.25	0.80	0.240	(0.140)	0.070	0.170
16	1.33	0.80	0.240	(0.140)	0.070	0.170
17	1.42	0.80	0.240	(0.140)	0.070	0.170
18	1.50	0.80	0.240	(0.140)	0.070	0.170
19	1.58	0.80	0.240	(0.140)	0.070	0.170
20	1.67	0.80	0.240	(0.140)	0.070	0.170
21	1.75	0.80	0.240	(0.140)	0.070	0.170
22	1.83	0.80	0.240	(0.140)	0.070	0.170
23	1.92	0.80	0.240	(0.140)	0.070	0.170
24	2.00	0.90	0.270	(0.140)	0.078	0.192
25	2.08	0.80	0.240	(0.140)	0.070	0.170
26	2.17	0.90	0.270	(0.140)	0.078	0.192
27	2.25	0.90	0.270	(0.140)	0.078	0.192
28	2.33	0.90	0.270	(0.140)	0.078	0.192
29	2.42	0.90	0.270	(0.140)	0.078	0.192
30	2.50	0.90	0.270	(0.140)	0.078	0.192
31	2.58	0.90	0.270	(0.140)	0.078	0.192
32	2.67	0.90	0.270	(0.140)	0.078	0.192
33	2.75	1.00	0.300	(0.140)	0.087	0.213
34	2.83	1.00	0.300	(0.140)	0.087	0.213
35	2.92	1.00	0.300	(0.140)	0.087	0.213
36	3.00	1.00	0.300	(0.140)	0.087	0.213
37	3.08	1.00	0.300	(0.140)	0.087	0.213
38	3.17	1.10	0.330	(0.140)	0.096	0.234
39	3.25	1.10	0.330	(0.140)	0.096	0.234
40	3.33	1.10	0.330	(0.140)	0.096	0.234
41	3.42	1.20	0.360	(0.140)	0.104	0.256
42	3.50	1.30	0.390	(0.140)	0.113	0.277
43	3.58	1.40	0.420	(0.140)	0.122	0.298
44	3.67	1.40	0.420	(0.140)	0.122	0.298
45	3.75	1.50	0.450	(0.140)	0.130	0.319
46	3.83	1.50	0.450	(0.140)	0.130	0.319
47	3.92	1.60	0.480	(0.140)	0.139	0.341
48	4.00	1.60	0.480	(0.140)	0.139	0.341
49	4.08	1.70	0.510	0.140	(0.148)	0.370
50	4.17	1.80	0.540	0.140	(0.157)	0.400
51	4.25	1.90	0.570	0.140	(0.165)	0.430
52	4.33	2.00	0.600	0.140	(0.174)	0.460
53	4.42	2.10	0.630	0.140	(0.183)	0.490
54	4.50	2.10	0.630	0.140	(0.183)	0.490
55	4.58	2.20	0.660	0.140	(0.191)	0.520
56	4.67	2.30	0.690	0.140	(0.200)	0.550
57	4.75	2.40	0.720	0.140	(0.209)	0.580
58	4.83	2.40	0.720	0.140	(0.209)	0.580
59	4.92	2.50	0.750	0.140	(0.217)	0.610

```
60   5.00     2.60      0.780          0.140    (  0.226)        0.640
61   5.08     3.10      0.930          0.140    (  0.270)        0.790
62   5.17     3.60      1.080          0.140    (  0.313)        0.940
63   5.25     3.90      1.170          0.140    (  0.339)        1.030
64   5.33     4.20      1.260          0.140    (  0.365)        1.120
65   5.42     4.70      1.410          0.140    (  0.409)        1.270
66   5.50     5.60      1.680          0.140    (  0.487)        1.540
67   5.58     1.90      0.570          0.140    (  0.165)        0.430
68   5.67     0.90      0.270       (  0.140)       0.078        0.192
69   5.75     0.60      0.180       (  0.140)       0.052        0.128
70   5.83     0.50      0.150       (  0.140)       0.043        0.106
71   5.92     0.30      0.090       (  0.140)       0.026        0.064
72   6.00     0.20      0.060       (  0.140)       0.017        0.043
               (Loss Rate Not Used)
   Sum =     100.0                                    Sum =    23.2
      Flood volume = Effective rainfall      1.94(In)
       times area      20.1(Ac.)/[(In)/(Ft.)] =       3.2(Ac.Ft)
      Total soil loss =      0.56(In)
      Total soil loss =     0.942(Ac.Ft)
      Total rainfall =      2.50(In)
      Flood volume =      141362.4 Cubic Feet
      Total soil loss =       41032.5 Cubic Feet
      ---------------------------------------------------------------------
       Peak flow rate of this hydrograph =     26.804(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        7.5      15.0      22.5      30.0
-------------------------------------------------------------------------
  0+ 5       0.0051      0.74  Q         |         |         |         |
  0+10       0.0182      1.90  V Q       |         |         |         |
  0+15       0.0343      2.33  V  Q      |         |         |         |
  0+20       0.0514      2.48  V  Q      |         |         |         |
  0+25       0.0689      2.55  V  Q      |         |         |         |
  0+30       0.0878      2.73  |V Q      |         |         |         |
  0+35       0.1080      2.94  |V Q      |         |         |         |
  0+40       0.1286      2.99  |V Q      |         |         |         |
  0+45       0.1493      3.01  |V  Q     |         |         |         |
  0+50       0.1701      3.02  | V Q     |         |         |         |
  0+55       0.1909      3.02  | V Q     |         |         |         |
  1+ 0       0.2127      3.17  | V Q     |         |         |         |
  1+ 5       0.2359      3.37  | V Q     |         |         |         |
  1+10       0.2595      3.42  |  VQ     |         |         |         |
  1+15       0.2832      3.44  |  VQ     |         |         |         |
  1+20       0.3069      3.45  |  VQ     |         |         |         |
  1+25       0.3307      3.45  |   Q     |         |         |         |
  1+30       0.3545      3.45  |   Q     |         |         |         |
  1+35       0.3783      3.45  |   Q     |         |         |         |
  1+40       0.4021      3.45  |   Q     |         |         |         |
  1+45       0.4258      3.45  |   QV    |         |         |         |
```



```
    6+25       3.2452      0.01  Q         |         |         |         V
-------------------------------------------------------------------------
```

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

Study date 06/26/23 File: PROPWEST10024100.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

REDLANDS WEST - DEVELOPED CONDITION
100-YEAR STORM EVENT
20-0186 WEST INDUSTRIAL PROJECT
06/26/2023 WG

Drainage Area = 20.10(Ac.) = 0.031 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 20.10(Ac.) = 0.031 Sq. Mi.
Length along longest watercourse = 1372.00(Ft.)
Length along longest watercourse measured to centroid = 918.00(Ft.)
Length along longest watercourse = 0.260 Mi.
Length along longest watercourse measured to centroid = 0.174 Mi.
Difference in elevation = 11.85(Ft.)
Slope along watercourse = 45.6035 Ft./Mi.
Average Manning's 'N' = 0.015
Lag time = 0.054 Hr.
Lag time = 3.22 Min.
25% of lag time = 0.81 Min.
40% of lag time = 1.29 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]
20.10	1.70	34.17

100 YEAR Area rainfall data:

```
Area(Ac.)[1]       Rainfall(In)[2]      Weighting[1*2]
       20.10            4.25                  85.43

STORM EVENT (YEAR) =  100.00
Area Averaged 2-Year Rainfall =    1.700(In)
Area Averaged 100-Year Rainfall =    4.250(In)

Point rain (area averaged) =    4.250(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    4.250(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
    20.100           62.50         0.760
 Total Area Entered =     20.10(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)     (In/Hr)      (Dec.)    (In/Hr)
62.5  62.5      0.443     0.760        0.140       1.000      0.140
                                                 Sum (F) =   0.140
Area averaged mean soil loss (F) (In/Hr) =  0.140
Minimum soil loss rate ((In/Hr)) =  0.070
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.290
------------------------------------------------------------------------

               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        155.186         34.407              6.970
    2   0.167        310.372         46.627              9.445
    3   0.250        465.558         10.888              2.206
    4   0.333        620.745          4.727              0.958
    5   0.417        775.931          2.324              0.471
    6   0.500        931.117          1.028              0.208
                              Sum = 100.000   Sum=      20.257
------------------------------------------------------------------------

 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   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
       (Hr.)  Percent   (In/Hr)         Max   |   Low        (In/Hr)
    1   0.08     0.07      0.034       (  0.248)       0.010        0.024
    2   0.17     0.07      0.034       (  0.247)       0.010        0.024
    3   0.25     0.07      0.034       (  0.246)       0.010        0.024
    4   0.33     0.10      0.051       (  0.245)       0.015        0.036
```

5	0.42	0.10	0.051	(0.244)	0.015	0.036
6	0.50	0.10	0.051	(0.243)	0.015	0.036
7	0.58	0.10	0.051	(0.242)	0.015	0.036
8	0.67	0.10	0.051	(0.241)	0.015	0.036
9	0.75	0.10	0.051	(0.241)	0.015	0.036
10	0.83	0.13	0.068	(0.240)	0.020	0.048
11	0.92	0.13	0.068	(0.239)	0.020	0.048
12	1.00	0.13	0.068	(0.238)	0.020	0.048
13	1.08	0.10	0.051	(0.237)	0.015	0.036
14	1.17	0.10	0.051	(0.236)	0.015	0.036
15	1.25	0.10	0.051	(0.235)	0.015	0.036
16	1.33	0.10	0.051	(0.234)	0.015	0.036
17	1.42	0.10	0.051	(0.233)	0.015	0.036
18	1.50	0.10	0.051	(0.232)	0.015	0.036
19	1.58	0.10	0.051	(0.231)	0.015	0.036
20	1.67	0.10	0.051	(0.230)	0.015	0.036
21	1.75	0.10	0.051	(0.229)	0.015	0.036
22	1.83	0.13	0.068	(0.228)	0.020	0.048
23	1.92	0.13	0.068	(0.227)	0.020	0.048
24	2.00	0.13	0.068	(0.227)	0.020	0.048
25	2.08	0.13	0.068	(0.226)	0.020	0.048
26	2.17	0.13	0.068	(0.225)	0.020	0.048
27	2.25	0.13	0.068	(0.224)	0.020	0.048
28	2.33	0.13	0.068	(0.223)	0.020	0.048
29	2.42	0.13	0.068	(0.222)	0.020	0.048
30	2.50	0.13	0.068	(0.221)	0.020	0.048
31	2.58	0.17	0.085	(0.220)	0.025	0.060
32	2.67	0.17	0.085	(0.219)	0.025	0.060
33	2.75	0.17	0.085	(0.218)	0.025	0.060
34	2.83	0.17	0.085	(0.217)	0.025	0.060
35	2.92	0.17	0.085	(0.217)	0.025	0.060
36	3.00	0.17	0.085	(0.216)	0.025	0.060
37	3.08	0.17	0.085	(0.215)	0.025	0.060
38	3.17	0.17	0.085	(0.214)	0.025	0.060
39	3.25	0.17	0.085	(0.213)	0.025	0.060
40	3.33	0.17	0.085	(0.212)	0.025	0.060
41	3.42	0.17	0.085	(0.211)	0.025	0.060
42	3.50	0.17	0.085	(0.210)	0.025	0.060
43	3.58	0.17	0.085	(0.209)	0.025	0.060
44	3.67	0.17	0.085	(0.209)	0.025	0.060
45	3.75	0.17	0.085	(0.208)	0.025	0.060
46	3.83	0.20	0.102	(0.207)	0.030	0.072
47	3.92	0.20	0.102	(0.206)	0.030	0.072
48	4.00	0.20	0.102	(0.205)	0.030	0.072
49	4.08	0.20	0.102	(0.204)	0.030	0.072
50	4.17	0.20	0.102	(0.203)	0.030	0.072
51	4.25	0.20	0.102	(0.202)	0.030	0.072
52	4.33	0.23	0.119	(0.202)	0.035	0.084
53	4.42	0.23	0.119	(0.201)	0.035	0.084
54	4.50	0.23	0.119	(0.200)	0.035	0.084
55	4.58	0.23	0.119	(0.199)	0.035	0.084
56	4.67	0.23	0.119	(0.198)	0.035	0.084
57	4.75	0.23	0.119	(0.197)	0.035	0.084
58	4.83	0.27	0.136	(0.196)	0.039	0.097
59	4.92	0.27	0.136	(0.196)	0.039	0.097

60	5.00	0.27	0.136	(0.195)	0.039	0.097
61	5.08	0.20	0.102	(0.194)	0.030	0.072
62	5.17	0.20	0.102	(0.193)	0.030	0.072
63	5.25	0.20	0.102	(0.192)	0.030	0.072
64	5.33	0.23	0.119	(0.191)	0.035	0.084
65	5.42	0.23	0.119	(0.191)	0.035	0.084
66	5.50	0.23	0.119	(0.190)	0.035	0.084
67	5.58	0.27	0.136	(0.189)	0.039	0.097
68	5.67	0.27	0.136	(0.188)	0.039	0.097
69	5.75	0.27	0.136	(0.187)	0.039	0.097
70	5.83	0.27	0.136	(0.186)	0.039	0.097
71	5.92	0.27	0.136	(0.186)	0.039	0.097
72	6.00	0.27	0.136	(0.185)	0.039	0.097
73	6.08	0.30	0.153	(0.184)	0.044	0.109
74	6.17	0.30	0.153	(0.183)	0.044	0.109
75	6.25	0.30	0.153	(0.182)	0.044	0.109
76	6.33	0.30	0.153	(0.182)	0.044	0.109
77	6.42	0.30	0.153	(0.181)	0.044	0.109
78	6.50	0.30	0.153	(0.180)	0.044	0.109
79	6.58	0.33	0.170	(0.179)	0.049	0.121
80	6.67	0.33	0.170	(0.178)	0.049	0.121
81	6.75	0.33	0.170	(0.177)	0.049	0.121
82	6.83	0.33	0.170	(0.177)	0.049	0.121
83	6.92	0.33	0.170	(0.176)	0.049	0.121
84	7.00	0.33	0.170	(0.175)	0.049	0.121
85	7.08	0.33	0.170	(0.174)	0.049	0.121
86	7.17	0.33	0.170	(0.173)	0.049	0.121
87	7.25	0.33	0.170	(0.173)	0.049	0.121
88	7.33	0.37	0.187	(0.172)	0.054	0.133
89	7.42	0.37	0.187	(0.171)	0.054	0.133
90	7.50	0.37	0.187	(0.170)	0.054	0.133
91	7.58	0.40	0.204	(0.170)	0.059	0.145
92	7.67	0.40	0.204	(0.169)	0.059	0.145
93	7.75	0.40	0.204	(0.168)	0.059	0.145
94	7.83	0.43	0.221	(0.167)	0.064	0.157
95	7.92	0.43	0.221	(0.166)	0.064	0.157
96	8.00	0.43	0.221	(0.166)	0.064	0.157
97	8.08	0.50	0.255	(0.165)	0.074	0.181
98	8.17	0.50	0.255	(0.164)	0.074	0.181
99	8.25	0.50	0.255	(0.163)	0.074	0.181
100	8.33	0.50	0.255	(0.163)	0.074	0.181
101	8.42	0.50	0.255	(0.162)	0.074	0.181
102	8.50	0.50	0.255	(0.161)	0.074	0.181
103	8.58	0.53	0.272	(0.160)	0.079	0.193
104	8.67	0.53	0.272	(0.160)	0.079	0.193
105	8.75	0.53	0.272	(0.159)	0.079	0.193
106	8.83	0.57	0.289	(0.158)	0.084	0.205
107	8.92	0.57	0.289	(0.157)	0.084	0.205
108	9.00	0.57	0.289	(0.157)	0.084	0.205
109	9.08	0.63	0.323	(0.156)	0.094	0.229
110	9.17	0.63	0.323	(0.155)	0.094	0.229
111	9.25	0.63	0.323	(0.154)	0.094	0.229
112	9.33	0.67	0.340	(0.154)	0.099	0.241
113	9.42	0.67	0.340	(0.153)	0.099	0.241
114	9.50	0.67	0.340	(0.152)	0.099	0.241

115	9.58	0.70	0.357	(	0.151)	0.104		0.253
116	9.67	0.70	0.357	(	0.151)	0.104		0.253
117	9.75	0.70	0.357	(	0.150)	0.104		0.253
118	9.83	0.73	0.374	(	0.149)	0.108		0.266
119	9.92	0.73	0.374	(	0.149)	0.108		0.266
120	10.00	0.73	0.374	(	0.148)	0.108		0.266
121	10.08	0.50	0.255	(	0.147)	0.074		0.181
122	10.17	0.50	0.255	(	0.146)	0.074		0.181
123	10.25	0.50	0.255	(	0.146)	0.074		0.181
124	10.33	0.50	0.255	(	0.145)	0.074		0.181
125	10.42	0.50	0.255	(	0.144)	0.074		0.181
126	10.50	0.50	0.255	(	0.144)	0.074		0.181
127	10.58	0.67	0.340	(	0.143)	0.099		0.241
128	10.67	0.67	0.340	(	0.142)	0.099		0.241
129	10.75	0.67	0.340	(	0.141)	0.099		0.241
130	10.83	0.67	0.340	(	0.141)	0.099		0.241
131	10.92	0.67	0.340	(	0.140)	0.099		0.241
132	11.00	0.67	0.340	(	0.139)	0.099		0.241
133	11.08	0.63	0.323	(	0.139)	0.094		0.229
134	11.17	0.63	0.323	(	0.138)	0.094		0.229
135	11.25	0.63	0.323	(	0.137)	0.094		0.229
136	11.33	0.63	0.323	(	0.137)	0.094		0.229
137	11.42	0.63	0.323	(	0.136)	0.094		0.229
138	11.50	0.63	0.323	(	0.135)	0.094		0.229
139	11.58	0.57	0.289	(	0.135)	0.084		0.205
140	11.67	0.57	0.289	(	0.134)	0.084		0.205
141	11.75	0.57	0.289	(	0.133)	0.084		0.205
142	11.83	0.60	0.306	(	0.133)	0.089		0.217
143	11.92	0.60	0.306	(	0.132)	0.089		0.217
144	12.00	0.60	0.306	(	0.131)	0.089		0.217
145	12.08	0.83	0.425	(	0.131)	0.123		0.302
146	12.17	0.83	0.425	(	0.130)	0.123		0.302
147	12.25	0.83	0.425	(	0.129)	0.123		0.302
148	12.33	0.87	0.442	(	0.129)	0.128		0.314
149	12.42	0.87	0.442		0.128	(0.128)		0.314
150	12.50	0.87	0.442		0.127	(0.128)		0.315
151	12.58	0.93	0.476		0.127	(0.138)		0.349
152	12.67	0.93	0.476		0.126	(0.138)		0.350
153	12.75	0.93	0.476		0.126	(0.138)		0.350
154	12.83	0.97	0.493		0.125	(0.143)		0.368
155	12.92	0.97	0.493		0.124	(0.143)		0.369
156	13.00	0.97	0.493		0.124	(0.143)		0.369
157	13.08	1.13	0.578		0.123	(0.168)		0.455
158	13.17	1.13	0.578		0.122	(0.168)		0.456
159	13.25	1.13	0.578		0.122	(0.168)		0.456
160	13.33	1.13	0.578		0.121	(0.168)		0.457
161	13.42	1.13	0.578		0.121	(0.168)		0.457
162	13.50	1.13	0.578		0.120	(0.168)		0.458
163	13.58	0.77	0.391	(	0.119)	0.113		0.278
164	13.67	0.77	0.391	(	0.119)	0.113		0.278
165	13.75	0.77	0.391	(	0.118)	0.113		0.278
166	13.83	0.77	0.391	(	0.117)	0.113		0.278
167	13.92	0.77	0.391	(	0.117)	0.113		0.278
168	14.00	0.77	0.391	(	0.116)	0.113		0.278
169	14.08	0.90	0.459		0.116	(0.133)		0.343

170	14.17	0.90	0.459	0.115	(0.133)	0.344
171	14.25	0.90	0.459	0.115	(0.133)	0.344
172	14.33	0.87	0.442	0.114	(0.128)	0.328
173	14.42	0.87	0.442	0.113	(0.128)	0.329
174	14.50	0.87	0.442	0.113	(0.128)	0.329
175	14.58	0.87	0.442	0.112	(0.128)	0.330
176	14.67	0.87	0.442	0.112	(0.128)	0.330
177	14.75	0.87	0.442	0.111	(0.128)	0.331
178	14.83	0.83	0.425	0.110	(0.123)	0.315
179	14.92	0.83	0.425	0.110	(0.123)	0.315
180	15.00	0.83	0.425	0.109	(0.123)	0.316
181	15.08	0.80	0.408	0.109	(0.118)	0.299
182	15.17	0.80	0.408	0.108	(0.118)	0.300
183	15.25	0.80	0.408	0.108	(0.118)	0.300
184	15.33	0.77	0.391	0.107	(0.113)	0.284
185	15.42	0.77	0.391	0.107	(0.113)	0.284
186	15.50	0.77	0.391	0.106	(0.113)	0.285
187	15.58	0.63	0.323	(0.105)	0.094	0.229
188	15.67	0.63	0.323	(0.105)	0.094	0.229
189	15.75	0.63	0.323	(0.104)	0.094	0.229
190	15.83	0.63	0.323	(0.104)	0.094	0.229
191	15.92	0.63	0.323	(0.103)	0.094	0.229
192	16.00	0.63	0.323	(0.103)	0.094	0.229
193	16.08	0.13	0.068	(0.102)	0.020	0.048
194	16.17	0.13	0.068	(0.102)	0.020	0.048
195	16.25	0.13	0.068	(0.101)	0.020	0.048
196	16.33	0.13	0.068	(0.101)	0.020	0.048
197	16.42	0.13	0.068	(0.100)	0.020	0.048
198	16.50	0.13	0.068	(0.100)	0.020	0.048
199	16.58	0.10	0.051	(0.099)	0.015	0.036
200	16.67	0.10	0.051	(0.099)	0.015	0.036
201	16.75	0.10	0.051	(0.098)	0.015	0.036
202	16.83	0.10	0.051	(0.098)	0.015	0.036
203	16.92	0.10	0.051	(0.097)	0.015	0.036
204	17.00	0.10	0.051	(0.097)	0.015	0.036
205	17.08	0.17	0.085	(0.096)	0.025	0.060
206	17.17	0.17	0.085	(0.096)	0.025	0.060
207	17.25	0.17	0.085	(0.095)	0.025	0.060
208	17.33	0.17	0.085	(0.095)	0.025	0.060
209	17.42	0.17	0.085	(0.094)	0.025	0.060
210	17.50	0.17	0.085	(0.094)	0.025	0.060
211	17.58	0.17	0.085	(0.093)	0.025	0.060
212	17.67	0.17	0.085	(0.093)	0.025	0.060
213	17.75	0.17	0.085	(0.092)	0.025	0.060
214	17.83	0.13	0.068	(0.092)	0.020	0.048
215	17.92	0.13	0.068	(0.092)	0.020	0.048
216	18.00	0.13	0.068	(0.091)	0.020	0.048
217	18.08	0.13	0.068	(0.091)	0.020	0.048
218	18.17	0.13	0.068	(0.090)	0.020	0.048
219	18.25	0.13	0.068	(0.090)	0.020	0.048
220	18.33	0.13	0.068	(0.089)	0.020	0.048
221	18.42	0.13	0.068	(0.089)	0.020	0.048
222	18.50	0.13	0.068	(0.088)	0.020	0.048
223	18.58	0.10	0.051	(0.088)	0.015	0.036
224	18.67	0.10	0.051	(0.088)	0.015	0.036

225	18.75	0.10	0.051	(0.087)	0.015	0.036
226	18.83	0.07	0.034	(0.087)	0.010	0.024
227	18.92	0.07	0.034	(0.086)	0.010	0.024
228	19.00	0.07	0.034	(0.086)	0.010	0.024
229	19.08	0.10	0.051	(0.085)	0.015	0.036
230	19.17	0.10	0.051	(0.085)	0.015	0.036
231	19.25	0.10	0.051	(0.085)	0.015	0.036
232	19.33	0.13	0.068	(0.084)	0.020	0.048
233	19.42	0.13	0.068	(0.084)	0.020	0.048
234	19.50	0.13	0.068	(0.084)	0.020	0.048
235	19.58	0.10	0.051	(0.083)	0.015	0.036
236	19.67	0.10	0.051	(0.083)	0.015	0.036
237	19.75	0.10	0.051	(0.082)	0.015	0.036
238	19.83	0.07	0.034	(0.082)	0.010	0.024
239	19.92	0.07	0.034	(0.082)	0.010	0.024
240	20.00	0.07	0.034	(0.081)	0.010	0.024
241	20.08	0.10	0.051	(0.081)	0.015	0.036
242	20.17	0.10	0.051	(0.081)	0.015	0.036
243	20.25	0.10	0.051	(0.080)	0.015	0.036
244	20.33	0.10	0.051	(0.080)	0.015	0.036
245	20.42	0.10	0.051	(0.080)	0.015	0.036
246	20.50	0.10	0.051	(0.079)	0.015	0.036
247	20.58	0.10	0.051	(0.079)	0.015	0.036
248	20.67	0.10	0.051	(0.079)	0.015	0.036
249	20.75	0.10	0.051	(0.078)	0.015	0.036
250	20.83	0.07	0.034	(0.078)	0.010	0.024
251	20.92	0.07	0.034	(0.078)	0.010	0.024
252	21.00	0.07	0.034	(0.077)	0.010	0.024
253	21.08	0.10	0.051	(0.077)	0.015	0.036
254	21.17	0.10	0.051	(0.077)	0.015	0.036
255	21.25	0.10	0.051	(0.076)	0.015	0.036
256	21.33	0.07	0.034	(0.076)	0.010	0.024
257	21.42	0.07	0.034	(0.076)	0.010	0.024
258	21.50	0.07	0.034	(0.075)	0.010	0.024
259	21.58	0.10	0.051	(0.075)	0.015	0.036
260	21.67	0.10	0.051	(0.075)	0.015	0.036
261	21.75	0.10	0.051	(0.075)	0.015	0.036
262	21.83	0.07	0.034	(0.074)	0.010	0.024
263	21.92	0.07	0.034	(0.074)	0.010	0.024
264	22.00	0.07	0.034	(0.074)	0.010	0.024
265	22.08	0.10	0.051	(0.074)	0.015	0.036
266	22.17	0.10	0.051	(0.073)	0.015	0.036
267	22.25	0.10	0.051	(0.073)	0.015	0.036
268	22.33	0.07	0.034	(0.073)	0.010	0.024
269	22.42	0.07	0.034	(0.073)	0.010	0.024
270	22.50	0.07	0.034	(0.073)	0.010	0.024
271	22.58	0.07	0.034	(0.072)	0.010	0.024
272	22.67	0.07	0.034	(0.072)	0.010	0.024
273	22.75	0.07	0.034	(0.072)	0.010	0.024
274	22.83	0.07	0.034	(0.072)	0.010	0.024
275	22.92	0.07	0.034	(0.072)	0.010	0.024
276	23.00	0.07	0.034	(0.071)	0.010	0.024
277	23.08	0.07	0.034	(0.071)	0.010	0.024
278	23.17	0.07	0.034	(0.071)	0.010	0.024
279	23.25	0.07	0.034	(0.071)	0.010	0.024

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280  23.33     0.07      0.034       (  0.071)       0.010        0.024
281  23.42     0.07      0.034       (  0.071)       0.010        0.024
282  23.50     0.07      0.034       (  0.070)       0.010        0.024
283  23.58     0.07      0.034       (  0.070)       0.010        0.024
284  23.67     0.07      0.034       (  0.070)       0.010        0.024
285  23.75     0.07      0.034       (  0.070)       0.010        0.024
286  23.83     0.07      0.034       (  0.070)       0.010        0.024
287  23.92     0.07      0.034       (  0.070)       0.010        0.024
288  24.00     0.07      0.034       (  0.070)       0.010        0.024
                (Loss Rate Not Used)
    Sum =     100.0                                    Sum =    36.8
       Flood volume = Effective rainfall      3.07(In)
        times area      20.1(Ac.)/[(In)/(Ft.)] =       5.1(Ac.Ft)
       Total soil loss =      1.18(In)
       Total soil loss =     1.979(Ac.Ft)
       Total rainfall =      4.25(In)
       Flood volume =      223858.2 Cubic Feet
       Total soil loss =       86222.4 Cubic Feet
       ------------------------------------------------------------------------
        Peak flow rate of this hydrograph =      9.272(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       0.0012      0.17  Q         |         |         |         |
   0+10       0.0039      0.40  VQ        |         |         |         |
   0+15       0.0070      0.45  VQ        |         |         |         |
   0+20       0.0108      0.56  V Q       |         |         |         |
   0+25       0.0155      0.68  V Q       |         |         |         |
   0+30       0.0204      0.71  V Q       |         |         |         |
   0+35       0.0254      0.73  V Q       |         |         |         |
   0+40       0.0305      0.73  V Q       |         |         |         |
   0+45       0.0355      0.73  V Q       |         |         |         |
   0+50       0.0412      0.82  V  Q      |         |         |         |
   0+55       0.0476      0.93  V  Q      |         |         |         |
   1+ 0       0.0542      0.96  V  Q      |         |         |         |
   1+ 5       0.0603      0.89  V  Q      |         |         |         |
   1+10       0.0656      0.78  V  Q      |         |         |         |
   1+15       0.0708      0.75  V  Q      |         |         |         |
   1+20       0.0759      0.74  V Q       |         |         |         |
   1+25       0.0810      0.74  V Q       |         |         |         |
   1+30       0.0861      0.73  V Q       |         |         |         |
   1+35       0.0911      0.73  V Q       |         |         |         |
   1+40       0.0962      0.73  V Q       |         |         |         |
   1+45       0.1012      0.73  V Q       |         |         |         |
   1+50       0.1069      0.82  V  Q      |         |         |         |
   1+55       0.1133      0.93  V  Q      |         |         |         |
   2+ 0       0.1199      0.96  V  Q      |         |         |         |
   2+ 5       0.1266      0.97  V  Q      |         |         |         |
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2+10	0.1333	0.98	V Q			
2+15	0.1400	0.98	V Q			
2+20	0.1468	0.98	V Q			
2+25	0.1535	0.98	V Q			
2+30	0.1602	0.98	V Q			
2+35	0.1676	1.06	V Q			
2+40	0.1757	1.18	V Q			
2+45	0.1840	1.20	V Q			
2+50	0.1923	1.21	V Q			
2+55	0.2007	1.22	V Q			
3+ 0	0.2092	1.22	V Q			
3+ 5	0.2176	1.22	V Q			
3+10	0.2260	1.22	V Q			
3+15	0.2344	1.22	V Q			
3+20	0.2428	1.22	V Q			
3+25	0.2513	1.22	V Q			
3+30	0.2597	1.22	V Q			
3+35	0.2681	1.22	V Q			
3+40	0.2765	1.22	V Q			
3+45	0.2850	1.22	V Q			
3+50	0.2940	1.31	V Q			
3+55	0.3038	1.42	V Q			
4+ 0	0.3137	1.45	V Q			
4+ 5	0.3238	1.46	V Q			
4+10	0.3339	1.47	V Q			
4+15	0.3440	1.47	V Q			
4+20	0.3547	1.55	V Q			
4+25	0.3661	1.67	V Q			
4+30	0.3778	1.69	V Q			
4+35	0.3895	1.70	V Q			
4+40	0.4013	1.71	V Q			
4+45	0.4131	1.71	V Q			
4+50	0.4255	1.80	V Q			
4+55	0.4386	1.91	V Q			
5+ 0	0.4520	1.94	V Q			
5+ 5	0.4642	1.78	V Q			
5+10	0.4750	1.56	V Q			
5+15	0.4853	1.51	V Q			
5+20	0.4961	1.57	V Q			
5+25	0.5077	1.67	V Q			
5+30	0.5193	1.69	V Q			
5+35	0.5316	1.79	V Q			
5+40	0.5448	1.91	V Q			
5+45	0.5581	1.94	V Q			
5+50	0.5715	1.95	V Q			
5+55	0.5850	1.95	V Q			
6+ 0	0.5985	1.96	V Q			
6+ 5	0.6125	2.04	V Q			
6+10	0.6274	2.16	V Q			
6+15	0.6424	2.18	V Q			
6+20	0.6575	2.19	V Q			
6+25	0.6726	2.20	V Q			
6+30	0.6878	2.20	V Q			
6+35	0.7036	2.29	V Q			
6+40	0.7201	2.40	V Q			

6+45	0.7368	2.43	V Q				
6+50	0.7536	2.44	V Q				
6+55	0.7704	2.44	V Q				
7+ 0	0.7873	2.45	V Q				
7+ 5	0.8041	2.45	V Q				
7+10	0.8210	2.45	V Q				
7+15	0.8378	2.45	V Q				
7+20	0.8552	2.53	V Q				
7+25	0.8734	2.64	V Q				
7+30	0.8918	2.67	V Q				
7+35	0.9109	2.77	V Q				
7+40	0.9308	2.89	V Q				
7+45	0.9509	2.92	V Q				
7+50	0.9716	3.01	V Q				
7+55	0.9932	3.13	V Q				
8+ 0	1.0149	3.16	V Q				
8+ 5	1.0379	3.34	V Q				
8+10	1.0625	3.57	V Q				
8+15	1.0875	3.63	V Q				
8+20	1.1127	3.65	V Q				
8+25	1.1379	3.66	V Q				
8+30	1.1632	3.67	V Q				
8+35	1.1891	3.75	V Q				
8+40	1.2157	3.87	V Q				
8+45	1.2425	3.89	V Q				
8+50	1.2700	3.99	V Q				
8+55	1.2983	4.11	V Q				
9+ 0	1.3268	4.14	V Q				
9+ 5	1.3565	4.32	V Q				
9+10	1.3879	4.55	V Q				
9+15	1.4196	4.61	V Q				
9+20	1.4521	4.72	V Q				
9+25	1.4854	4.84	V Q				
9+30	1.5190	4.87	V Q				
9+35	1.5532	4.97	V Q				
9+40	1.5883	5.09	V Q				
9+45	1.6235	5.12	V Q				
9+50	1.6594	5.21	V Q				
9+55	1.6961	5.33	V Q				
10+ 0	1.7331	5.36	V Q				
10+ 5	1.7660	4.78	V Q				
10+10	1.7935	3.99	V Q				
10+15	1.8197	3.81	VQ				
10+20	1.8454	3.73	Q				
10+25	1.8708	3.69	Q				
10+30	1.8960	3.67	Q				
10+35	1.9242	4.09	V Q				
10+40	1.9563	4.66	V Q				
10+45	1.9893	4.79	V Q				
10+50	2.0227	4.85	V Q				
10+55	2.0563	4.88	V Q				
11+ 0	2.0900	4.89	V Q				
11+ 5	2.1232	4.81	V Q				
11+10	2.1555	4.69	V Q				
11+15	2.1876	4.67	VQ				

11+20	2.2197	4.66	|	|	VQ |	|	|
11+25	2.2517	4.65	|	|	VQ |	|	|
11+30	2.2837	4.65	|	|	VQ |	|	|
11+35	2.3146	4.48	|	|	QV |	|	|
11+40	2.3439	4.25	|	|	QV |	|	|
11+45	2.3728	4.20	|	|	Q V |	|	|
11+50	2.4021	4.26	|	|	QV |	|	|
11+55	2.4321	4.36	|	|	QV |	|	|
12+ 0	2.4623	4.38	|	|	Q V|	|	|
12+ 5	2.4967	4.98	|	|	Q|	|	|
12+10	2.5365	5.79	|	|	V| Q	|	|
12+15	2.5777	5.98	|	|	V Q	|	|
12+20	2.6200	6.14	|	|	V Q	|	|
12+25	2.6634	6.30	|	|	V Q	|	|
12+30	2.7071	6.35	|	|	|V Q	|	|
12+35	2.7526	6.61	|	|	|V Q	|	|
12+40	2.8004	6.94	|	|	|V Q	|	|
12+45	2.8488	7.04	|	|	| V Q	|	|
12+50	2.8984	7.20	|	|	| V Q	|	|
12+55	2.9493	7.39	|	|	| V Q|	|	|
13+ 0	3.0006	7.45	|	|	| V Q|	|	|
13+ 5	3.0561	8.07	|	|	| V | Q	|	|
13+10	3.1174	8.89	|	|	| V | Q	|	|
13+15	3.1800	9.10	|	|	| V | Q	|	|
13+20	3.2433	9.19	|	|	| V | Q	|	|
13+25	3.3070	9.24	|	|	| V | Q	|	|
13+30	3.3708	9.27	|	|	| V | Q	|	|
13+35	3.4261	8.02	|	|	| V | Q	|	|
13+40	3.4696	6.32	|	|	| Q V	|	|
13+45	3.5104	5.92	|	|	| Q V	|	|
13+50	3.5499	5.75	|	|	| Q V	|	|
13+55	3.5890	5.66	|	|	| Q V	|	|
14+ 0	3.6277	5.63	|	|	| Q V	|	|
14+ 5	3.6696	6.08	|	|	| Q V	|	|
14+10	3.7158	6.71	|	|	| Q V	|	|
14+15	3.7631	6.86	|	|	| Q V|	|	|
14+20	3.8100	6.82	|	|	| Q V|	|	|
14+25	3.8562	6.70	|	|	| Q V	|	|
14+30	3.9023	6.69	|	|	| Q V	|	|
14+35	3.9483	6.68	|	|	| Q V	|	|
14+40	3.9944	6.69	|	|	| Q |V	|	|
14+45	4.0405	6.70	|	|	| Q |V	|	|
14+50	4.0859	6.59	|	|	| Q |V	|	|
14+55	4.1302	6.44	|	|	| Q | V	|	|
15+ 0	4.1744	6.41	|	|	| Q | V	|	|
15+ 5	4.2177	6.29	|	|	| Q | V	|	|
15+10	4.2600	6.13	|	|	| Q | V	|	|
15+15	4.3020	6.10	|	|	| Q | V	|	|
15+20	4.3432	5.98	|	|	| Q | V	|	|
15+25	4.3833	5.82	|	|	| Q | V	|	|
15+30	4.4232	5.79	|	|	| Q | V	|	|
15+35	4.4603	5.40	|	|	|Q | V	|	|
15+40	4.4938	4.86	|	|	Q| | V	|	|
15+45	4.5265	4.74	|	|	Q | | V	|	|
15+50	4.5587	4.69	|	|	Q | | V	|	|

15+55	4.5908	4.66		Q		V	
16+ 0	4.6228	4.65		Q		V	
16+ 5	4.6461	3.39	Q			V	
16+10	4.6577	1.67	Q			V	
16+15	4.6665	1.27	Q			V	
16+20	4.6740	1.10	Q			V	
16+25	4.6810	1.02	Q			V	
16+30	4.6878	0.98	Q			V	
16+35	4.6939	0.89	Q			V	
16+40	4.6993	0.78	Q			V	
16+45	4.7045	0.75	Q			V	
16+50	4.7096	0.74	Q			V	
16+55	4.7147	0.74	Q			V	
17+ 0	4.7197	0.73	Q			V	
17+ 5	4.7259	0.90	Q			V	
17+10	4.7337	1.13	Q			V	
17+15	4.7419	1.18	Q			V	
17+20	4.7502	1.21	Q			V	
17+25	4.7586	1.22	Q			V	
17+30	4.7670	1.22	Q			V	
17+35	4.7754	1.22	Q			V	
17+40	4.7839	1.22	Q			V	
17+45	4.7923	1.22	Q			V	
17+50	4.8001	1.14	Q			V	
17+55	4.8072	1.02	Q			V	
18+ 0	4.8141	1.00	Q			V	
18+ 5	4.8209	0.99	Q			V	
18+10	4.8276	0.98	Q			V	
18+15	4.8343	0.98	Q			V	
18+20	4.8411	0.98	Q			V	
18+25	4.8478	0.98	Q			V	
18+30	4.8546	0.98	Q			V	
18+35	4.8607	0.89	Q			V	
18+40	4.8661	0.78	Q			V	
18+45	4.8713	0.75	Q			V	
18+50	4.8758	0.66	Q			V	
18+55	4.8795	0.54	Q			V	
19+ 0	4.8830	0.51	Q			V	
19+ 5	4.8870	0.58	Q			V	
19+10	4.8918	0.69	Q			V	
19+15	4.8967	0.71	Q			V	
19+20	4.9023	0.81	Q			V	
19+25	4.9087	0.93	Q			V	
19+30	4.9153	0.96	Q			V	
19+35	4.9214	0.89	Q			V	
19+40	4.9267	0.78	Q			V	
19+45	4.9319	0.75	Q			V	
19+50	4.9365	0.66	Q			V	
19+55	4.9402	0.54	Q			V	
20+ 0	4.9437	0.51	Q			V	
20+ 5	4.9477	0.58	Q			V	
20+10	4.9524	0.69	Q			V	
20+15	4.9574	0.71	Q			V	
20+20	4.9624	0.73	Q			V	
20+25	4.9674	0.73	Q			V	

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  20+30       4.9724      0.73  | Q       |         |         |       V |
  20+35       4.9775      0.73  | Q       |         |         |       V |
  20+40       4.9826      0.73  | Q       |         |         |       V |
  20+45       4.9876      0.73  | Q       |         |         |       V |
  20+50       4.9921      0.65  | Q       |         |         |       V |
  20+55       4.9958      0.54  | Q       |         |         |       V |
  21+ 0       4.9993      0.51  | Q       |         |         |       V |
  21+ 5       5.0033      0.58  | Q       |         |         |       V |
  21+10       5.0080      0.69  | Q       |         |         |       V |
  21+15       5.0129      0.71  | Q       |         |         |        V|
  21+20       5.0174      0.64  | Q       |         |         |        V|
  21+25       5.0210      0.53  | Q       |         |         |        V|
  21+30       5.0245      0.51  | Q       |         |         |        V|
  21+35       5.0285      0.58  | Q       |         |         |        V|
  21+40       5.0333      0.69  | Q       |         |         |        V|
  21+45       5.0382      0.71  | Q       |         |         |        V|
  21+50       5.0426      0.64  | Q       |         |         |        V|
  21+55       5.0463      0.53  | Q       |         |         |        V|
  22+ 0       5.0498      0.51  | Q       |         |         |        V|
  22+ 5       5.0538      0.58  | Q       |         |         |        V|
  22+10       5.0586      0.69  | Q       |         |         |        V|
  22+15       5.0635      0.71  | Q       |         |         |        V|
  22+20       5.0679      0.64  | Q       |         |         |        V|
  22+25       5.0716      0.53  | Q       |         |         |        V|
  22+30       5.0751      0.51  | Q       |         |         |        V|
  22+35       5.0785      0.50  |Q        |         |         |        V|
  22+40       5.0819      0.49  |Q        |         |         |        V|
  22+45       5.0853      0.49  |Q        |         |         |        V|
  22+50       5.0886      0.49  |Q        |         |         |        V|
  22+55       5.0920      0.49  |Q        |         |         |        V|
  23+ 0       5.0954      0.49  |Q        |         |         |        V|
  23+ 5       5.0987      0.49  |Q        |         |         |        V|
  23+10       5.1021      0.49  |Q        |         |         |        V|
  23+15       5.1055      0.49  |Q        |         |         |        V|
  23+20       5.1089      0.49  |Q        |         |         |        V|
  23+25       5.1122      0.49  |Q        |         |         |        V|
  23+30       5.1156      0.49  |Q        |         |         |        V|
  23+35       5.1190      0.49  |Q        |         |         |        V|
  23+40       5.1223      0.49  |Q        |         |         |        V|
  23+45       5.1257      0.49  |Q        |         |         |        V|
  23+50       5.1291      0.49  |Q        |         |         |        V|
  23+55       5.1324      0.49  |Q        |         |         |        V|
  24+ 0       5.1358      0.49  |Q        |         |         |        V|
  24+ 5       5.1380      0.32  |Q        |         |         |        V|
  24+10       5.1387      0.09  Q         |         |         |        V|
  24+15       5.1389      0.04  Q         |         |         |        V|
  24+20       5.1390      0.02  Q         |         |         |        V|
  24+25       5.1391      0.01  Q         |         |         |         V
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STAGE-STORAGE/OUTFLOW TABLE

Basin 1 - Stage/Storage/Outflow Table
W.O.# 20-0186 - Redlands West

UG Chamber Storage		100-Year	WEIR
Tributary Area:	20.1 AC	Q ALLOWABLE	20
DCV=	N/A		
Bottom Chamber Ele	1435.50	L(ft)	4
Bottom Stone Elevat	1434.75	C	3
		Invert H (ft)	5.5

100 YEAR
WEIR +PUMP (Q=5.0 CFS)

$Q_{ORIFICE}$= Cd*Area*$(2*G*H)^{0.5}$
Q_{WEIR}= C*L*$H^{3/2}$

#	Elevation (ft)	Depth (ft)	Storage (cf)	Storage (ac-ft)	H (ft)	Q (cfs)	Total Q (cfs)	Comments
1	1435.5	0	0.00	0.000			5.00	Bottom of Chamber
2	1436	0.5	12235.72	0.281		0.00	5.00	
3	1436.5	1	19286.43	0.443		0.00	5.00	
4	1437	1.5	26119.75	0.600		0.00	5.00	
5	1437.5	2	32657.67	0.750		0.00	5.00	
6	1438	2.5	38792.55	0.891		0.00	5.00	
7	1438.5	3	44355.79	1.018		0.00	5.00	
8	1439	3.5	48890.35	1.122		0.00	5.00	
9	1439.5	4	52339.64	1.202		0.00	5.00	
10	1440	4.5	55686.98	1.278		0.00	5.00	
11	1440.5	5	59034.32	1.355		0.00	5.00	
12	1441	5.5	62381.66	1.432	0	0.00	5.00	Weir Opening
13	1441.5	6	65729.00	1.509	0.5	4.24	9.24	
14	1442	6.5	69076.34	1.586	1	12.00	17.00	Top of Storage

Project: **Redlands West Industrial**

Chamber Model -	MC-3500	
Units -	**Imperial**	Click Here for Metric
Number of Chambers -	310	
Number of End Caps -	10	
Voids in the stone (porosity) -	40	%
Base of STONE Elevation -	1431.75	ft
Amount of Stone Above Chambers -	36	in
Amount of Stone Below Chambers -	9	in
Area of system -	16737	sf Min. Area - 16090 sf min. area

☑ Include Perimeter Stone in Calculations

Height of System *(inches)*	Incremental Single Chamber *(cubic feet)*	Incremental Single End Cap *(cubic feet)*	Incremental Chambers *(cubic feet)*	Incremental End Cap *(cubic feet)*	Incremental Stone *(cubic feet)*	Incremental Ch, EC and Stone *(cubic feet)*	Cumulative System (cubic feet)	Elevation (feet)
90	0.00	0.00	0.00	0.00	557.89	557.89	70750.01	1439.25
89	0.00	0.00	0.00	0.00	557.89	557.89	70192.12	1439.17
88	0.00	0.00	0.00	0.00	557.89	557.89	69634.23	1439.08
87	0.00	0.00	0.00	0.00	557.89	557.89	69076.34	1439.00
86	0.00	0.00	0.00	0.00	557.89	557.89	68518.45	1438.92
85	0.00	0.00	0.00	0.00	557.89	557.89	67960.56	1438.83
84	0.00	0.00	0.00	0.00	557.89	557.89	67402.67	1438.75
83	0.00	0.00	0.00	0.00	557.89	557.89	66844.78	1438.67
82	0.00	0.00	0.00	0.00	557.89	557.89	66286.89	1438.58
81	0.00	0.00	0.00	0.00	557.89	557.89	65729.00	1438.50
80	0.00	0.00	0.00	0.00	557.89	557.89	65171.11	1438.42
79	0.00	0.00	0.00	0.00	557.89	557.89	64613.22	1438.33
78	0.00	0.00	0.00	0.00	557.89	557.89	64055.33	1438.25
77	0.00	0.00	0.00	0.00	557.89	557.89	63497.44	1438.17
76	0.00	0.00	0.00	0.00	557.89	557.89	62939.55	1438.08
75	0.00	0.00	0.00	0.00	557.89	557.89	62381.66	1438.00
74	0.00	0.00	0.00	0.00	557.89	557.89	61823.77	1437.92
73	0.00	0.00	0.00	0.00	557.89	557.89	61265.88	1437.83
72	0.00	0.00	0.00	0.00	557.89	557.89	60707.99	1437.75
71	0.00	0.00	0.00	0.00	557.89	557.89	60150.10	1437.67
70	0.00	0.00	0.00	0.00	557.89	557.89	59592.21	1437.58
69	0.00	0.00	0.00	0.00	557.89	557.89	59034.32	1437.50
68	0.00	0.00	0.00	0.00	557.89	557.89	58476.43	1437.42
67	0.00	0.00	0.00	0.00	557.89	557.89	57918.54	1437.33
66	0.00	0.00	0.00	0.00	557.89	557.89	57360.65	1437.25
65	0.00	0.00	0.00	0.00	557.89	557.89	56802.76	1437.17
64	0.00	0.00	0.00	0.00	557.89	557.89	56244.87	1437.08
63	0.00	0.00	0.00	0.00	557.89	557.89	55686.98	1437.00
62	0.00	0.00	0.00	0.00	557.89	557.89	55129.09	1436.92
61	0.00	0.00	0.00	0.00	557.89	557.89	54571.20	1436.83
60	0.00	0.00	0.00	0.00	557.89	557.89	54013.31	1436.75
59	0.00	0.00	0.00	0.00	557.89	557.89	53455.42	1436.67
58	0.00	0.00	0.00	0.00	557.89	557.89	52897.53	1436.58
57	0.00	0.00	0.00	0.00	557.89	557.89	52339.64	1436.50
56	0.00	0.00	0.00	0.00	557.89	557.89	51781.75	1436.42
55	0.00	0.00	0.00	0.00	557.89	557.89	51223.86	1436.33
54	0.06	0.00	18.01	0.00	550.69	568.69	50665.97	1436.25
53	0.19	0.02	60.17	0.24	533.73	594.14	50097.28	1436.17
52	0.29	0.04	91.13	0.38	521.29	612.79	49503.14	1436.08
51	0.40	0.05	125.13	0.52	507.63	633.28	48890.35	1436.00
50	0.69	0.07	213.03	0.68	472.41	686.11	48257.07	1435.92
49	1.03	0.09	318.77	0.88	430.03	749.68	47570.96	1435.83
48	1.25	0.11	387.35	1.07	402.52	790.94	46821.28	1435.75
47	1.42	0.13	440.89	1.26	381.03	823.18	46030.33	1435.67
46	1.57	0.14	487.67	1.44	362.24	851.36	45207.15	1435.58
45	1.71	0.16	529.22	1.63	345.55	876.40	44355.79	1435.50
44	1.83	0.18	566.83	1.82	330.43	899.08	43479.39	1435.42
43	1.94	0.20	600.71	2.01	316.80	919.52	42580.31	1435.33
42	2.04	0.22	632.66	2.18	303.95	938.79	41660.79	1435.25
41	2.13	0.23	661.75	2.35	292.25	956.35	40722.00	1435.17
40	2.22	0.25	689.51	2.51	281.08	973.10	39765.65	1435.08
39	2.31	0.27	715.11	2.66	270.79	988.55	38792.55	1435.00
38	2.38	0.28	739.28	2.80	261.06	1003.14	37804.00	1434.92
37	2.46	0.29	762.32	2.94	251.79	1017.05	36800.87	1434.83
36	2.53	0.31	783.73	3.08	243.17	1029.98	35783.82	1434.75
35	2.59	0.32	804.06	3.21	234.98	1042.25	34753.84	1434.67
34	2.66	0.33	823.38	3.34	227.20	1053.92	33711.59	1434.58
33	2.72	0.35	841.68	3.47	219.83	1064.98	32657.67	1434.50
32	2.77	0.36	859.10	3.60	212.81	1075.51	31592.69	1434.42
31	2.82	0.37	875.64	3.72	206.14	1085.51	30517.18	1434.33
30	2.88	0.38	891.39	3.84	199.80	1095.03	29431.67	1434.25
29	2.92	0.40	906.48	3.96	193.71	1104.16	28336.64	1434.17
28	2.97	0.41	920.67	4.08	187.99	1112.73	27232.48	1434.08
27	3.01	0.42	933.86	4.19	182.67	1120.72	26119.75	1434.00
26	3.05	0.43	946.51	4.30	177.57	1128.37	24999.03	1433.92
25	3.09	0.44	959.23	4.40	172.44	1136.07	23870.65	1433.83
24	3.13	0.45	970.47	4.51	167.90	1142.88	22734.59	1433.75
23	3.17	0.46	981.36	4.61	163.50	1149.47	21591.71	1433.67
22	3.20	0.47	991.83	4.71	159.28	1155.81	20442.24	1433.58
21	3.23	0.48	1001.65	4.80	155.31	1161.76	19286.43	1433.50
20	3.26	0.49	1011.04	4.89	151.52	1167.45	18124.67	1433.42
19	3.29	0.50	1019.98	4.98	147.91	1172.87	16957.22	1433.33
18	3.32	0.51	1028.57	5.06	144.44	1178.07	15784.36	1433.25
17	3.34	0.51	1036.68	5.14	141.16	1182.98	14606.29	1433.17
16	3.37	0.52	1044.27	5.22	138.09	1187.59	13423.30	1433.08
15	3.39	0.53	1051.68	5.30	135.10	1192.07	12235.72	1433.00
14	3.41	0.54	1058.51	5.37	132.34	1196.21	11043.64	1432.92
13	3.44	0.54	1065.48	5.43	129.53	1200.43	9847.43	1432.83
12	3.46	0.55	1071.89	5.49	126.94	1204.32	8647.00	1432.75
11	3.48	0.56	1078.40	5.55	124.31	1208.26	7442.68	1432.67
10	3.51	0.59	1086.58	5.95	120.88	1213.41	6234.42	1432.58
9	0.00	0.00	0.00	0.00	557.89	557.89	5021.01	1432.50
8	0.00	0.00	0.00	0.00	557.89	557.89	4463.12	1432.42
7	0.00	0.00	0.00	0.00	557.89	557.89	3905.23	1432.33
6	0.00	0.00	0.00	0.00	557.89	557.89	3347.34	1432.25
5	0.00	0.00	0.00	0.00	557.89	557.89	2789.45	1432.17
4	0.00	0.00	0.00	0.00	557.89	557.89	2231.56	1432.08
3	0.00	0.00	0.00	0.00	557.89	557.89	1673.67	1432.00
2	0.00	0.00	0.00	0.00	557.89	557.89	1115.78	1431.92
1	0.00	0.00	0.00	0.00	557.89	557.89	557.89	1431.83

100-YEAR, 1-HOUR ROUTING ANALYSIS

FLOOD HYDROGRAPH ROUTING PROGRAM
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
Study date: 06/26/23

PROPOSED 100-YR, 1-HOUR STORM EVENT
REDLANDS WEST - ROUTING
20-0186 UG CHAMBER STORAGE PUMP
06/26/2023 WG 5.0 CFS

Program License Serial Number 4010

********** HYDROGRAPH INFORMATION **********

From study/file name: PROPWEST1001100.rte
**********HYDROGRAPH DATA**********
Number of intervals = 17
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 49.373 (CFS)
Total volume = 1.775 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

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Process from Point/Station 100.000 to Point/Station 101.000
**** RETARDING BASIN ROUTING ****
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User entry of depth-outflow-storage data

Total number of inflow hydrograph intervals = 17
Hydrograph time unit = 5.000 (Min.)
Initial depth in storage basin = 0.00(Ft.)

Initial basin depth = 0.00 (Ft.)
Initial basin storage = 0.00 (Ac.Ft)
Initial basin outflow = 0.00 (CFS)

Depth vs. Storage and Depth vs. Discharge data:

Basin Depth (Ft.)	Storage (Ac.Ft)	Outflow (CFS)	(S-O*dt/2) (Ac.Ft)	(S+O*dt/2) (Ac.Ft)

0.000	0.000	0.000	0.000	0.000
0.500	0.281	5.000	0.264	0.298
1.000	0.443	5.000	0.426	0.460
1.500	0.600	5.000	0.583	0.617
2.000	0.750	5.000	0.733	0.767
2.500	0.891	5.000	0.874	0.908
3.000	1.018	5.000	1.001	1.035
3.500	1.122	5.000	1.105	1.139
4.000	1.202	5.000	1.185	1.219
4.500	1.278	5.000	1.261	1.295
5.000	1.355	5.000	1.338	1.372
5.500	1.432	5.000	1.415	1.449
6.000	1.509	9.240	1.477	1.541
6.500	1.586	17.000	1.527	1.645

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0 12.3 24.69 37.03 49.37	Depth (Ft.)
0.083	3.24	0.19	0.011	O I | | | |	0.02
0.167	7.73	0.80	0.045	O I | | | |	0.08
0.250	9.60	1.71	0.096	|O I | | | |	0.17
0.333	11.03	2.70	0.152	|O I| | | |	0.27
0.417	12.28	3.73	0.210	| O I| | | |	0.37
0.500	14.28	4.84	0.272	| O |I | | |	0.48
0.583	16.44	5.00	0.344	| O | I | | |	0.69
0.667	19.22	5.00	0.432	| O | I | | |	0.97
0.750	25.00	5.00	0.550	| O | I | |	1.34
0.833	47.48	5.00	0.765	| O | | | I |	2.05
0.917	49.37	5.00	1.064	| O | | | I	3.22
1.000	23.18	5.00	1.280	| O | I| | |	4.51
1.083	12.21	5.00	1.367	| O I| | | |	5.08
1.167	4.33	5.00	1.390	| IO | | | |	5.22
1.250	1.79	5.00	1.376	|I O | | | |	5.14
1.333	0.45	5.00	1.349	I O | | | |	4.96
1.417	0.12	5.00	1.317	I O | | | |	4.75
1.500	0.00	5.00	1.283	I O | | | |	4.53
1.583	0.00	5.00	1.249	I O | | | |	4.31
1.667	0.00	5.00	1.214	I O | | | |	4.08
1.750	0.00	5.00	1.180	I O | | | |	3.86
1.833	0.00	5.00	1.145	I O | | | |	3.65
1.917	0.00	5.00	1.111	I O | | | |	3.45
2.000	0.00	5.00	1.076	I O | | | |	3.28
2.083	0.00	5.00	1.042	I O | | | |	3.11
2.167	0.00	5.00	1.007	I O | | | |	2.96
2.250	0.00	5.00	0.973	I O | | | |	2.82
2.333	0.00	5.00	0.939	I O | | | |	2.69
2.417	0.00	5.00	0.904	I O | | | |	2.55
2.500	0.00	5.00	0.870	I O | | | |	2.42
2.583	0.00	5.00	0.835	I O | | | |	2.30
2.667	0.00	5.00	0.801	I O | | | |	2.18

2.750	0.00	5.00	0.766	I O				2.06
2.833	0.00	5.00	0.732	I O				1.94
2.917	0.00	5.00	0.698	I O				1.83
3.000	0.00	5.00	0.663	I O				1.71
3.083	0.00	5.00	0.629	I O				1.60
3.167	0.00	5.00	0.594	I O				1.48
3.250	0.00	5.00	0.560	I O				1.37
3.333	0.00	5.00	0.525	I O				1.26
3.417	0.00	5.00	0.491	I O				1.15
3.500	0.00	5.00	0.457	I O				1.04
3.583	0.00	5.00	0.422	I O				0.94
3.667	0.00	5.00	0.388	I O				0.83
3.750	0.00	5.00	0.353	I O				0.72
3.833	0.00	5.00	0.319	I O				0.62
3.917	0.00	5.00	0.284	I O				0.51
4.000	0.00	4.48	0.252	I O				0.45
4.083	0.00	3.96	0.223	I O				0.40
4.167	0.00	3.50	0.197	I O				0.35
4.250	0.00	3.10	0.174	I O				0.31
4.333	0.00	2.74	0.154	IO				0.27
4.417	0.00	2.43	0.136	IO				0.24
4.500	0.00	2.14	0.121	IO				0.21
4.583	0.00	1.90	0.107	IO				0.19
4.667	0.00	1.68	0.094	IO				0.17
4.750	0.00	1.48	0.083	O				0.15
4.833	0.00	1.31	0.074	O				0.13
4.917	0.00	1.16	0.065	O				0.12
5.000	0.00	1.03	0.058	O				0.10
5.083	0.00	0.91	0.051	O				0.09
5.167	0.00	0.80	0.045	O				0.08
5.250	0.00	0.71	0.040	O				0.07
5.333	0.00	0.63	0.035	O				0.06
5.417	0.00	0.56	0.031	O				0.06
5.500	0.00	0.49	0.028	O				0.05
5.583	0.00	0.44	0.024	O				0.04
5.667	0.00	0.38	0.022	O				0.04
5.750	0.00	0.34	0.019	O				0.03
5.833	0.00	0.30	0.017	O				0.03
5.917	0.00	0.27	0.015	O				0.03
6.000	0.00	0.24	0.013	O				0.02
6.083	0.00	0.21	0.012	O				0.02
6.167	0.00	0.18	0.010	O				0.02
6.250	0.00	0.16	0.009	O				0.02
6.333	0.00	0.14	0.008	O				0.01
6.417	0.00	0.13	0.007	O				0.01
6.500	0.00	0.11	0.006	O				0.01
6.583	0.00	0.10	0.006	O				0.01
6.667	0.00	0.09	0.005	O				0.01
6.750	0.00	0.08	0.004	O				0.01
6.833	0.00	0.07	0.004	O				0.01
6.917	0.00	0.06	0.003	O				0.01
7.000	0.00	0.05	0.003	O				0.01
7.083	0.00	0.05	0.003	O				0.00
7.167	0.00	0.04	0.002	O				0.00
7.250	0.00	0.04	0.002	O				0.00

7.333	0.00	0.03	0.002	O	|	|	|	0.00
7.417	0.00	0.03	0.002	O	|	|	|	0.00
7.500	0.00	0.03	0.001	O	|	|	|	0.00
7.583	0.00	0.02	0.001	O	|	|	|	0.00
7.667	0.00	0.02	0.001	O	|	|	|	0.00
7.750	0.00	0.02	0.001	O	|	|	|	0.00
7.833	0.00	0.02	0.001	O	|	|	|	0.00
7.917	0.00	0.01	0.001	O	|	|	|	0.00
8.000	0.00	0.01	0.001	O	|	|	|	0.00
8.083	0.00	0.01	0.001	O	|	|	|	0.00
8.167	0.00	0.01	0.001	O	|	|	|	0.00

**********HYDROGRAPH DATA**********

Number of intervals = 98
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 5.000 (CFS)
Total volume = 1.775 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

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100-YEAR, 3-HOUR ROUTING ANALYSIS

FLOOD HYDROGRAPH ROUTING PROGRAM

Study date: 06/26/23

PROPOSED 100-YR, 3-HOUR STORM EVENT
RELANDS WEST - ROUTING
20-0186 UG CHAMBER STORAGE PUMP
06/26/2023 WG 5.0 CFS

Program License Serial Number 4010

********** HYDROGRAPH INFORMATION **********

From study/file name: PROPWEST1003100.rte
**********HYDROGRAPH DATA**********
Number of intervals = 41
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 30.848 (CFS)
Total volume = 2.565 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

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Process from Point/Station 100.000 to Point/Station 101.000
**** RETARDING BASIN ROUTING ****
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User entry of depth-outflow-storage data

Total number of inflow hydrograph intervals = 41
Hydrograph time unit = 5.000 (Min.)
Initial depth in storage basin = 0.00(Ft.)

Initial basin depth = 0.00 (Ft.)
Initial basin storage = 0.00 (Ac.Ft)
Initial basin outflow = 0.00 (CFS)

Depth vs. Storage and Depth vs. Discharge data:

Basin Depth (Ft.)	Storage (Ac.Ft)	Outflow (CFS)	(S-O*dt/2) (Ac.Ft)	(S+O*dt/2) (Ac.Ft)

0.000	0.000	0.000	0.000	0.000
0.500	0.281	5.000	0.264	0.298
1.000	0.443	5.000	0.426	0.460
1.500	0.600	5.000	0.583	0.617
2.000	0.750	5.000	0.733	0.767
2.500	0.891	5.000	0.874	0.908
3.000	1.018	5.000	1.001	1.035
3.500	1.122	5.000	1.105	1.139
4.000	1.202	5.000	1.185	1.219
4.500	1.278	5.000	1.261	1.295
5.000	1.355	5.000	1.338	1.372
5.500	1.432	5.000	1.415	1.449
6.000	1.509	9.240	1.477	1.541
6.500	1.586	17.000	1.527	1.645

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0 7.7 15.42 23.14 30.85	Depth (Ft.)
0.083	1.47	0.08	0.005	OI | | | | |	0.01
0.167	3.46	0.36	0.020	O I | | | | |	0.04
0.250	3.69	0.73	0.041	O I | | | | |	0.07
0.333	4.04	1.09	0.061	|O I | | | |	0.11
0.417	4.68	1.47	0.083	|O I | | | |	0.15
0.500	5.18	1.87	0.105	|O I | | | |	0.19
0.583	5.34	2.26	0.127	| O I | | | |	0.23
0.667	5.35	2.62	0.147	| O I | | | |	0.26
0.750	5.76	2.96	0.166	| O I | | | |	0.30
0.833	5.51	3.27	0.184	| O I | | | |	0.33
0.917	5.20	3.51	0.197	| O I | | | |	0.35
1.000	5.48	3.72	0.209	| O I | | | |	0.37
1.083	6.28	3.97	0.223	| O I | | | |	0.40
1.167	7.00	4.28	0.240	| O I| | | |	0.43
1.250	7.19	4.60	0.259	| O I| | | |	0.46
1.333	7.01	4.89	0.275	| O I| | | |	0.49
1.417	7.59	5.00	0.291	| O I| | | |	0.53
1.500	8.90	5.00	0.313	| O |I | | |	0.60
1.583	8.89	5.00	0.340	| O |I | | |	0.68
1.667	8.87	5.00	0.367	| O |I | | |	0.77
1.750	10.40	5.00	0.399	| O | I | | |	0.86
1.833	11.50	5.00	0.440	| O | I | | |	0.99
1.917	11.09	5.00	0.483	| O | I | | |	1.13
2.000	10.86	5.00	0.524	| O | I | | |	1.26
2.083	11.17	5.00	0.566	| O | I | | |	1.39
2.167	13.15	5.00	0.615	| O | I | | |	1.55
2.250	16.83	5.00	0.684	| O | |I | |	1.78
2.333	16.75	5.00	0.765	| O | |I | |	2.05
2.417	19.42	5.00	0.855	| O | | I | |	2.37
2.500	26.87	5.00	0.980	| O | | | I |	2.85
2.583	30.85	5.00	1.145	| O | | | I	3.64
2.667	29.98	5.00	1.320	| O | | | I|	4.77

2.750	19.72	6.13	1.452	| O |	|	I |	|	5.63
2.833	10.42	8.98	1.504	| |OI	|	|	|	5.97
2.917	7.79	9.02	1.505	| IO	|	|	|	5.97
3.000	5.31	8.23	1.491	| I O	|	|	|	5.88
3.083	2.24	6.81	1.465	| I O|	|	|	|	5.71
3.167	0.70	5.11	1.434	I O |	|	|	|	5.51
3.250	0.29	5.00	1.403	I O |	|	|	|	5.31
3.333	0.11	5.00	1.370	I O |	|	|	|	5.09
3.417	0.02	5.00	1.336	I O |	|	|	|	4.87
3.500	0.00	5.00	1.301	I O |	|	|	|	4.65
3.583	0.00	5.00	1.267	I O |	|	|	|	4.43
3.667	0.00	5.00	1.232	I O |	|	|	|	4.20
3.750	0.00	5.00	1.198	I O |	|	|	|	3.97
3.833	0.00	5.00	1.163	I O |	|	|	|	3.76
3.917	0.00	5.00	1.129	I O |	|	|	|	3.54
4.000	0.00	5.00	1.095	I O |	|	|	|	3.37
4.083	0.00	5.00	1.060	I O |	|	|	|	3.20
4.167	0.00	5.00	1.026	I O |	|	|	|	3.04
4.250	0.00	5.00	0.991	I O |	|	|	|	2.89
4.333	0.00	5.00	0.957	I O |	|	|	|	2.76
4.417	0.00	5.00	0.922	I O |	|	|	|	2.62
4.500	0.00	5.00	0.888	I O |	|	|	|	2.49
4.583	0.00	5.00	0.853	I O |	|	|	|	2.37
4.667	0.00	5.00	0.819	I O |	|	|	|	2.24
4.750	0.00	5.00	0.785	I O |	|	|	|	2.12
4.833	0.00	5.00	0.750	I O |	|	|	|	2.00
4.917	0.00	5.00	0.716	I O |	|	|	|	1.89
5.000	0.00	5.00	0.681	I O |	|	|	|	1.77
5.083	0.00	5.00	0.647	I O |	|	|	|	1.66
5.167	0.00	5.00	0.612	I O |	|	|	|	1.54
5.250	0.00	5.00	0.578	I O |	|	|	|	1.43
5.333	0.00	5.00	0.544	I O |	|	|	|	1.32
5.417	0.00	5.00	0.509	I O |	|	|	|	1.21
5.500	0.00	5.00	0.475	I O |	|	|	|	1.10
5.583	0.00	5.00	0.440	I O |	|	|	|	0.99
5.667	0.00	5.00	0.406	I O |	|	|	|	0.89
5.750	0.00	5.00	0.371	I O |	|	|	|	0.78
5.833	0.00	5.00	0.337	I O |	|	|	|	0.67
5.917	0.00	5.00	0.303	I O |	|	|	|	0.57
6.000	0.00	4.78	0.269	I O |	|	|	|	0.48
6.083	0.00	4.23	0.238	I O |	|	|	|	0.42
6.167	0.00	3.74	0.210	I O |	|	|	|	0.37
6.250	0.00	3.31	0.186	I O |	|	|	|	0.33
6.333	0.00	2.93	0.165	I O |	|	|	|	0.29
6.417	0.00	2.59	0.146	I O |	|	|	|	0.26
6.500	0.00	2.29	0.129	I O |	|	|	|	0.23
6.583	0.00	2.03	0.114	I O |	|	|	|	0.20
6.667	0.00	1.79	0.101	IO |	|	|	|	0.18
6.750	0.00	1.59	0.089	IO |	|	|	|	0.16
6.833	0.00	1.40	0.079	IO |	|	|	|	0.14
6.917	0.00	1.24	0.070	IO |	|	|	|	0.12
7.000	0.00	1.10	0.062	IO |	|	|	|	0.11
7.083	0.00	0.97	0.055	IO |	|	|	|	0.10
7.167	0.00	0.86	0.048	O |	|	|	|	0.09
7.250	0.00	0.76	0.043	O |	|	|	|	0.08

7.333	0.00	0.67	0.038	O	|	|	|	|	0.07
7.417	0.00	0.59	0.033	O	|	|	|	|	0.06
7.500	0.00	0.53	0.030	O	|	|	|	|	0.05
7.583	0.00	0.46	0.026	O	|	|	|	|	0.05
7.667	0.00	0.41	0.023	O	|	|	|	|	0.04
7.750	0.00	0.36	0.020	O	|	|	|	|	0.04
7.833	0.00	0.32	0.018	O	|	|	|	|	0.03
7.917	0.00	0.28	0.016	O	|	|	|	|	0.03
8.000	0.00	0.25	0.014	O	|	|	|	|	0.03
8.083	0.00	0.22	0.013	O	|	|	|	|	0.02
8.167	0.00	0.20	0.011	O	|	|	|	|	0.02
8.250	0.00	0.17	0.010	O	|	|	|	|	0.02
8.333	0.00	0.15	0.009	O	|	|	|	|	0.02
8.417	0.00	0.14	0.008	O	|	|	|	|	0.01
8.500	0.00	0.12	0.007	O	|	|	|	|	0.01
8.583	0.00	0.11	0.006	O	|	|	|	|	0.01
8.667	0.00	0.09	0.005	O	|	|	|	|	0.01
8.750	0.00	0.08	0.005	O	|	|	|	|	0.01
8.833	0.00	0.07	0.004	O	|	|	|	|	0.01
8.917	0.00	0.07	0.004	O	|	|	|	|	0.01
9.000	0.00	0.06	0.003	O	|	|	|	|	0.01
9.083	0.00	0.05	0.003	O	|	|	|	|	0.01
9.167	0.00	0.05	0.003	O	|	|	|	|	0.00
9.250	0.00	0.04	0.002	O	|	|	|	|	0.00
9.333	0.00	0.04	0.002	O	|	|	|	|	0.00
9.417	0.00	0.03	0.002	O	|	|	|	|	0.00
9.500	0.00	0.03	0.002	O	|	|	|	|	0.00
9.583	0.00	0.02	0.001	O	|	|	|	|	0.00
9.667	0.00	0.02	0.001	O	|	|	|	|	0.00
9.750	0.00	0.02	0.001	O	|	|	|	|	0.00
9.833	0.00	0.02	0.001	O	|	|	|	|	0.00
9.917	0.00	0.01	0.001	O	|	|	|	|	0.00
10.000	0.00	0.01	0.001	O	|	|	|	|	0.00
10.083	0.00	0.01	0.001	O	|	|	|	|	0.00
10.167	0.00	0.01	0.001	O	|	|	|	|	0.00
10.250	0.00	0.01	0.001	O	|	|	|	|	0.00

**********HYDROGRAPH DATA**********

Number of intervals = 123
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 9.018 (CFS)
Total volume = 2.564 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

****

100-YEAR, 6-HOUR ROUTING ANALYSIS

FLOOD HYDROGRAPH ROUTING PROGRAM
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
Study date: 06/26/23

PROPOSED 100-YEAR, 6- HOUR STORM EVENT
REDLANDS WEST - ROUTING
20-0186 UG CHAMBER STORAGE PUMP
06/26/2023 WG 5.0 CFS

Program License Serial Number 4010

********** HYDROGRAPH INFORMATION **********

From study/file name: PROPWEST1006100.rte
**********HYDROGRAPH DATA**********
Number of intervals = 77
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 26.804 (CFS)
Total volume = 3.245 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

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Process from Point/Station 100.000 to Point/Station 101.000
**** RETARDING BASIN ROUTING ****
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User entry of depth-outflow-storage data

Total number of inflow hydrograph intervals = 77
Hydrograph time unit = 5.000 (Min.)
Initial depth in storage basin = 0.00(Ft.)

Initial basin depth = 0.00 (Ft.)
Initial basin storage = 0.00 (Ac.Ft)
Initial basin outflow = 0.00 (CFS)

Depth vs. Storage and Depth vs. Discharge data:

Basin Depth (Ft.)	Storage (Ac.Ft)	Outflow (CFS)	(S-O*dt/2) (Ac.Ft)	(S+O*dt/2) (Ac.Ft)

0.000	0.000	0.000	0.000	0.000
0.500	0.281	5.000	0.264	0.298
1.000	0.443	5.000	0.426	0.460
1.500	0.600	5.000	0.583	0.617
2.000	0.750	5.000	0.733	0.767
2.500	0.891	5.000	0.874	0.908
3.000	1.018	5.000	1.001	1.035
3.500	1.122	5.000	1.105	1.139
4.000	1.202	5.000	1.185	1.219
4.500	1.278	5.000	1.261	1.295
5.000	1.355	5.000	1.338	1.372
5.500	1.432	5.000	1.415	1.449
6.000	1.509	9.240	1.477	1.541
6.500	1.586	17.000	1.527	1.645

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0 6.7 13.40 20.10 26.80	Depth (Ft.)
0.083	0.74	0.04	0.002	O | | | |	0.00
0.167	1.90	0.19	0.011	O I | | | |	0.02
0.250	2.33	0.41	0.023	O I | | | |	0.04
0.333	2.48	0.64	0.036	O I | | | |	0.06
0.417	2.55	0.86	0.048	|O I | | | |	0.09
0.500	2.73	1.07	0.060	|O I | | | |	0.11
0.583	2.94	1.27	0.071	|O I | | | |	0.13
0.667	2.99	1.47	0.082	|O I | | | |	0.15
0.750	3.01	1.64	0.092	|O I | | | |	0.16
0.833	3.02	1.80	0.101	| OI | | | |	0.18
0.917	3.02	1.94	0.109	| OI | | | |	0.19
1.000	3.17	2.07	0.117	| OI | | | |	0.21
1.083	3.37	2.21	0.124	| O I | | | |	0.22
1.167	3.42	2.35	0.132	| O I | | | |	0.23
1.250	3.44	2.47	0.139	| O I | | | |	0.25
1.333	3.45	2.59	0.145	| OI | | | |	0.26
1.417	3.45	2.69	0.151	| OI | | | |	0.27
1.500	3.45	2.77	0.156	| OI | | | |	0.28
1.583	3.45	2.85	0.160	| OI | | | |	0.29
1.667	3.45	2.92	0.164	| OI | | | |	0.29
1.750	3.45	2.98	0.168	| OI | | | |	0.30
1.833	3.45	3.04	0.171	| OI | | | |	0.30
1.917	3.45	3.09	0.173	| OI | | | |	0.31
2.000	3.60	3.14	0.176	| OI | | | |	0.31
2.083	3.65	3.19	0.179	| OI | | | |	0.32
2.167	3.65	3.25	0.182	| OI | | | |	0.32
2.250	3.82	3.30	0.186	| OI | | | |	0.33
2.333	3.86	3.37	0.189	| O | | | |	0.34
2.417	3.87	3.42	0.192	| O | | | |	0.34
2.500	3.88	3.48	0.195	| O | | | |	0.35
2.583	3.89	3.52	0.198	| O | | | |	0.35
2.667	3.89	3.56	0.200	| O | | | |	0.36

2.750	4.03	3.61	0.203	| O |	|	|	|	0.36
2.833	4.23	3.67	0.206	| OI |	|	|	|	0.37
2.917	4.28	3.74	0.210	| OI |	|	|	|	0.37
3.000	4.30	3.80	0.214	| OI |	|	|	|	0.38
3.083	4.31	3.86	0.217	| OI |	|	|	|	0.39
3.167	4.47	3.92	0.220	| OI |	|	|	|	0.39
3.250	4.67	4.00	0.225	| OI |	|	|	|	0.40
3.333	4.71	4.08	0.229	| OI |	|	|	|	0.41
3.417	4.88	4.16	0.234	| OI |	|	|	|	0.42
3.500	5.24	4.26	0.240	| OI |	|	|	|	0.43
3.583	5.64	4.40	0.247	| OI |	|	|	|	0.44
3.667	5.91	4.56	0.256	| O I|	|	|	|	0.46
3.750	6.14	4.73	0.266	| O I|	|	|	|	0.47
3.833	6.37	4.90	0.276	| O I|	|	|	|	0.49
3.917	6.58	5.00	0.286	| O I|	|	|	|	0.52
4.000	6.81	5.00	0.298	| O I |	|	|	|	0.55
4.083	7.07	5.00	0.311	| O I |	|	|	|	0.59
4.167	7.58	5.00	0.327	| O |I |	|	|	|	0.64
4.250	8.15	5.00	0.347	| O |I |	|	|	|	0.70
4.333	8.74	5.00	0.371	| O | I |	|	|	|	0.78
4.417	9.34	5.00	0.399	| O | I |	|	|	|	0.86
4.500	9.74	5.00	0.430	| O | I |	|	|	|	0.96
4.583	10.06	5.00	0.464	| O | I |	|	|	|	1.07
4.667	10.61	5.00	0.500	| O | I |	|	|	|	1.18
4.750	11.18	5.00	0.541	| O | I |	|	|	|	1.31
4.833	11.57	5.00	0.585	| O | I |	|	|	|	1.45
4.917	11.89	5.00	0.631	| O | I |	|	|	|	1.60
5.000	12.43	5.00	0.680	| O | I |	|	|	|	1.77
5.083	13.85	5.00	0.736	| O | I |	|	|	|	1.95
5.167	16.41	5.00	0.806	| O | | I |	|	|	|	2.20
5.250	18.83	5.00	0.893	| O | | I |	|	|	|	2.51
5.333	20.80	5.00	0.995	| O | | I |	|	|	|	2.91
5.417	23.12	5.00	1.112	| O | | I |	|	|	|	3.45
5.500	26.80	5.00	1.249	| O | | I |	|	|	|	4.31
5.583	22.11	5.00	1.383	| O | | I |	|	|	|	5.18
5.667	10.76	6.40	1.457	| O| I |	|	|	|	5.66
5.750	5.96	7.02	1.469	| IO |	|	|	|	5.74
5.833	3.77	6.33	1.456	| I O|	|	|	|	5.66
5.917	2.44	5.31	1.438	| I O |	|	|	|	5.54
6.000	1.44	5.00	1.415	|I O |	|	|	|	5.39
6.083	0.75	5.00	1.389	I O |	|	|	|	5.22
6.167	0.23	5.00	1.357	I O |	|	|	|	5.02
6.250	0.09	5.00	1.324	I O |	|	|	|	4.80
6.333	0.03	5.00	1.290	I O |	|	|	|	4.58
6.417	0.01	5.00	1.256	I O |	|	|	|	4.35
6.500	0.00	5.00	1.221	I O |	|	|	|	4.13
6.583	0.00	5.00	1.187	I O |	|	|	|	3.91
6.667	0.00	5.00	1.153	I O |	|	|	|	3.69
6.750	0.00	5.00	1.118	I O |	|	|	|	3.48
6.833	0.00	5.00	1.084	I O |	|	|	|	3.32
6.917	0.00	5.00	1.049	I O |	|	|	|	3.15
7.000	0.00	5.00	1.015	I O |	|	|	|	2.99
7.083	0.00	5.00	0.980	I O |	|	|	|	2.85
7.167	0.00	5.00	0.946	I O |	|	|	|	2.72
7.250	0.00	5.00	0.912	I O |	|	|	|	2.58

7.333	0.00	5.00	0.877	I	O	|	|	|	2.45
7.417	0.00	5.00	0.843	I	O	|	|	|	2.33
7.500	0.00	5.00	0.808	I	O	|	|	|	2.21
7.583	0.00	5.00	0.774	I	O	|	|	|	2.08
7.667	0.00	5.00	0.739	I	O	|	|	|	1.96
7.750	0.00	5.00	0.705	I	O	|	|	|	1.85
7.833	0.00	5.00	0.670	I	O	|	|	|	1.73
7.917	0.00	5.00	0.636	I	O	|	|	|	1.62
8.000	0.00	5.00	0.602	I	O	|	|	|	1.51
8.083	0.00	5.00	0.567	I	O	|	|	|	1.40
8.167	0.00	5.00	0.533	I	O	|	|	|	1.29
8.250	0.00	5.00	0.498	I	O	|	|	|	1.18
8.333	0.00	5.00	0.464	I	O	|	|	|	1.07
8.417	0.00	5.00	0.429	I	O	|	|	|	0.96
8.500	0.00	5.00	0.395	I	O	|	|	|	0.85
8.583	0.00	5.00	0.361	I	O	|	|	|	0.75
8.667	0.00	5.00	0.326	I	O	|	|	|	0.64
8.750	0.00	5.00	0.292	I	O	|	|	|	0.53
8.833	0.00	4.60	0.259	I	O	|	|	|	0.46
8.917	0.00	4.07	0.229	I	O	|	|	|	0.41
9.000	0.00	3.60	0.202	I	O	|	|	|	0.36
9.083	0.00	3.18	0.179	I	O	|	|	|	0.32
9.167	0.00	2.82	0.158	I	O	|	|	|	0.28
9.250	0.00	2.49	0.140	I	O	|	|	|	0.25
9.333	0.00	2.20	0.124	I	O	|	|	|	0.22
9.417	0.00	1.95	0.110	I	O	|	|	|	0.19
9.500	0.00	1.72	0.097	I	O	|	|	|	0.17
9.583	0.00	1.53	0.086	I	O	|	|	|	0.15
9.667	0.00	1.35	0.076	I	O	|	|	|	0.13
9.750	0.00	1.19	0.067	I	O	|	|	|	0.12
9.833	0.00	1.06	0.059	I	O	|	|	|	0.11
9.917	0.00	0.93	0.052	I	O	|	|	|	0.09
10.000	0.00	0.83	0.046		O	|	|	|	0.08
10.083	0.00	0.73	0.041		O	|	|	|	0.07
10.167	0.00	0.65	0.036		O	|	|	|	0.06
10.250	0.00	0.57	0.032		O	|	|	|	0.06
10.333	0.00	0.51	0.028		O	|	|	|	0.05
10.417	0.00	0.45	0.025		O	|	|	|	0.04
10.500	0.00	0.40	0.022		O	|	|	|	0.04
10.583	0.00	0.35	0.020		O	|	|	|	0.03
10.667	0.00	0.31	0.017		O	|	|	|	0.03
10.750	0.00	0.27	0.015		O	|	|	|	0.03
10.833	0.00	0.24	0.014		O	|	|	|	0.02
10.917	0.00	0.21	0.012		O	|	|	|	0.02
11.000	0.00	0.19	0.011		O	|	|	|	0.02
11.083	0.00	0.17	0.009		O	|	|	|	0.02
11.167	0.00	0.15	0.008		O	|	|	|	0.01
11.250	0.00	0.13	0.007		O	|	|	|	0.01
11.333	0.00	0.12	0.007		O	|	|	|	0.01
11.417	0.00	0.10	0.006		O	|	|	|	0.01
11.500	0.00	0.09	0.005		O	|	|	|	0.01
11.583	0.00	0.08	0.005		O	|	|	|	0.01
11.667	0.00	0.07	0.004		O	|	|	|	0.01
11.750	0.00	0.06	0.004		O	|	|	|	0.01
11.833	0.00	0.06	0.003		O	|	|	|	0.01

11.917	0.00	0.05	0.003	O	|	|	|	|	0.00
12.000	0.00	0.04	0.002	O	|	|	|	|	0.00
12.083	0.00	0.04	0.002	O	|	|	|	|	0.00
12.167	0.00	0.03	0.002	O	|	|	|	|	0.00
12.250	0.00	0.03	0.002	O	|	|	|	|	0.00
12.333	0.00	0.03	0.001	O	|	|	|	|	0.00
12.417	0.00	0.02	0.001	O	|	|	|	|	0.00
12.500	0.00	0.02	0.001	O	|	|	|	|	0.00
12.583	0.00	0.02	0.001	O	|	|	|	|	0.00
12.667	0.00	0.02	0.001	O	|	|	|	|	0.00
12.750	0.00	0.01	0.001	O	|	|	|	|	0.00
12.833	0.00	0.01	0.001	O	|	|	|	|	0.00
12.917	0.00	0.01	0.001	O	|	|	|	|	0.00
13.000	0.00	0.01	0.001	O	|	|	|	|	0.00

**********HYDROGRAPH DATA**********

Number of intervals = 156
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 7.022 (CFS)
Total volume = 3.245 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

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100-YEAR, 24-HOUR ROUTING ANALYSIS

FLOOD HYDROGRAPH ROUTING PROGRAM
Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
Study date: 06/26/23

PROPOSED 100-YEAR 24-HOUR STORM EVENT
REDLANDS WEST - ROUTING
20-0186 UG CHAMBER STORAGE PUMP
06/26/2023 WG 5.0 CFS

Program License Serial Number 4010

********** HYDROGRAPH INFORMATION **********

From study/file name: PROPWEST10024100.rte
**********HYDROGRAPH DATA**********
Number of intervals = 293
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 9.272 (CFS)
Total volume = 5.139 (Ac.Ft)
Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

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Process from Point/Station 100.000 to Point/Station 101.000
**** RETARDING BASIN ROUTING ****
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User entry of depth-outflow-storage data

Total number of inflow hydrograph intervals = 293
Hydrograph time unit = 5.000 (Min.)
Initial depth in storage basin = 0.00(Ft.)

Initial basin depth = 0.00 (Ft.)
Initial basin storage = 0.00 (Ac.Ft)
Initial basin outflow = 0.00 (CFS)

Depth vs. Storage and Depth vs. Discharge data:

Basin Depth (Ft.)	Storage (Ac.Ft)	Outflow (CFS)	(S-O*dt/2) (Ac.Ft)	(S+O*dt/2) (Ac.Ft)

0.000	0.000	0.000	0.000	0.000
0.500	0.281	5.000	0.264	0.298
1.000	0.443	5.000	0.426	0.460
1.500	0.600	5.000	0.583	0.617
2.000	0.750	5.000	0.733	0.767
2.500	0.891	5.000	0.874	0.908
3.000	1.018	5.000	1.001	1.035
3.500	1.122	5.000	1.105	1.139
4.000	1.202	5.000	1.185	1.219
4.500	1.278	5.000	1.261	1.295
5.000	1.355	5.000	1.338	1.372
5.500	1.432	5.000	1.415	1.449
6.000	1.509	9.240	1.477	1.541
6.500	1.586	17.000	1.527	1.645

Hydrograph Detention Basin Routing

Graph values: 'I'= unit inflow; 'O'=outflow at time shown

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0 2.3 4.64 6.95 9.27	Depth (Ft.)
0.083	0.17	0.01	0.001	O | | | |	0.00
0.167	0.40	0.04	0.002	OI | | | |	0.00
0.250	0.45	0.09	0.005	OI | | | |	0.01
0.333	0.56	0.13	0.008	OI | | | |	0.01
0.417	0.68	0.19	0.011	O I | | | |	0.02
0.500	0.71	0.25	0.014	O I | | | |	0.02
0.583	0.73	0.30	0.017	|OI | | | |	0.03
0.667	0.73	0.35	0.020	|OI | | | |	0.04
0.750	0.73	0.40	0.022	|OI | | | |	0.04
0.833	0.82	0.44	0.025	|OI | | | |	0.04
0.917	0.93	0.49	0.028	|O I | | | |	0.05
1.000	0.96	0.54	0.030	|O I | | | |	0.05
1.083	0.89	0.59	0.033	| OI | | | |	0.06
1.167	0.78	0.61	0.035	| O | | | |	0.06
1.250	0.75	0.63	0.036	| O | | | |	0.06
1.333	0.74	0.65	0.036	| O | | | |	0.06
1.417	0.74	0.66	0.037	| O | | | |	0.07
1.500	0.73	0.67	0.037	| O | | | |	0.07
1.583	0.73	0.67	0.038	| O | | | |	0.07
1.667	0.73	0.68	0.038	| O | | | |	0.07
1.750	0.73	0.69	0.039	| O | | | |	0.07
1.833	0.82	0.70	0.039	| O | | | |	0.07
1.917	0.93	0.72	0.040	| OI | | | |	0.07
2.000	0.96	0.74	0.042	| OI | | | |	0.07
2.083	0.97	0.77	0.043	| OI | | | |	0.08
2.167	0.98	0.79	0.045	| OI | | | |	0.08
2.250	0.98	0.81	0.046	| OI | | | |	0.08
2.333	0.98	0.83	0.047	| OI | | | |	0.08
2.417	0.98	0.85	0.048	| OI | | | |	0.08
2.500	0.98	0.86	0.049	| OI | | | |	0.09
2.583	1.06	0.88	0.050	| O | | | |	0.09
2.667	1.18	0.91	0.051	| OI | | | |	0.09

2.750	1.20	0.94	0.053	OI				0.09
2.833	1.21	0.97	0.055	OI				0.10
2.917	1.22	1.00	0.056	OI				0.10
3.000	1.22	1.03	0.058	OI				0.10
3.083	1.22	1.05	0.059	OI				0.10
3.167	1.22	1.07	0.060	OI				0.11
3.250	1.22	1.09	0.061	OI				0.11
3.333	1.22	1.10	0.062	OI				0.11
3.417	1.22	1.12	0.063	OI				0.11
3.500	1.22	1.13	0.063	OI				0.11
3.583	1.22	1.14	0.064	OI				0.11
3.667	1.22	1.15	0.065	OI				0.11
3.750	1.22	1.16	0.065	OI				0.12
3.833	1.31	1.17	0.066	O				0.12
3.917	1.42	1.19	0.067	O				0.12
4.000	1.45	1.22	0.069	O				0.12
4.083	1.46	1.25	0.070	OI				0.12
4.167	1.47	1.27	0.072	OI				0.13
4.250	1.47	1.29	0.073	OI				0.13
4.333	1.55	1.32	0.074	OI				0.13
4.417	1.67	1.35	0.076	OI				0.14
4.500	1.69	1.39	0.078	OI				0.14
4.583	1.70	1.43	0.080	OI				0.14
4.667	1.71	1.46	0.082	O				0.15
4.750	1.71	1.49	0.084	O				0.15
4.833	1.80	1.52	0.085	OI				0.15
4.917	1.91	1.56	0.088	OI				0.16
5.000	1.94	1.60	0.090	OI				0.16
5.083	1.78	1.63	0.092	OI				0.16
5.167	1.56	1.63	0.092	O				0.16
5.250	1.51	1.62	0.091	O				0.16
5.333	1.57	1.61	0.091	O				0.16
5.417	1.67	1.61	0.091	O				0.16
5.500	1.69	1.62	0.091	O				0.16
5.583	1.79	1.64	0.092	OI				0.16
5.667	1.91	1.66	0.093	OI				0.17
5.750	1.94	1.69	0.095	OI				0.17
5.833	1.95	1.72	0.097	OI				0.17
5.917	1.95	1.75	0.098	O				0.17
6.000	1.96	1.77	0.099	O				0.18
6.083	2.04	1.80	0.101	OI				0.18
6.167	2.16	1.83	0.103	OI				0.18
6.250	2.18	1.87	0.105	OI				0.19
6.333	2.19	1.91	0.107	OI				0.19
6.417	2.20	1.94	0.109	OI				0.19
6.500	2.20	1.97	0.111	OI				0.20
6.583	2.29	2.00	0.113	OI				0.20
6.667	2.40	2.04	0.115	OI				0.20
6.750	2.43	2.08	0.117	OI				0.21
6.833	2.44	2.12	0.119	OI				0.21
6.917	2.44	2.16	0.121	OI				0.22
7.000	2.45	2.19	0.123	OI				0.22
7.083	2.45	2.22	0.125	OI				0.22
7.167	2.45	2.25	0.126	OI				0.22
7.250	2.45	2.27	0.128	OI				0.23

7.333	2.53	2.30	0.129	|	OI	|	|	0.23
7.417	2.64	2.33	0.131	|	OI	|	|	0.23
7.500	2.67	2.37	0.133	|	OI	|	|	0.24
7.583	2.77	2.41	0.135	|	OI	|	|	0.24
7.667	2.89	2.46	0.138	|	OI	|	|	0.25
7.750	2.92	2.51	0.141	|	O I	|	|	0.25
7.833	3.01	2.56	0.144	|	O I	|	|	0.26
7.917	3.13	2.62	0.147	|	|OI	|	|	0.26
8.000	3.16	2.68	0.151	|	|OI	|	|	0.27
8.083	3.34	2.75	0.154	|	|O I	|	|	0.27
8.167	3.57	2.83	0.159	|	|O I	|	|	0.28
8.250	3.63	2.92	0.164	|	| O I	|	|	0.29
8.333	3.65	3.00	0.169	|	| O I	|	|	0.30
8.417	3.66	3.08	0.173	|	| O I	|	|	0.31
8.500	3.67	3.15	0.177	|	| O I	|	|	0.31
8.583	3.75	3.21	0.180	|	| OI	|	|	0.32
8.667	3.87	3.28	0.184	|	| O I	|	|	0.33
8.750	3.89	3.35	0.188	|	| O I	|	|	0.33
8.833	3.99	3.42	0.192	|	| O I	|	|	0.34
8.917	4.11	3.49	0.196	|	| O I |	|	|	0.35
9.000	4.14	3.56	0.200	|	| O I |	|	|	0.36
9.083	4.32	3.64	0.205	|	| O I |	|	|	0.36
9.167	4.55	3.73	0.210	|	| O I|	|	|	0.37
9.250	4.61	3.83	0.215	|	| O I|	|	|	0.38
9.333	4.72	3.93	0.221	|	| O I	|	|	0.39
9.417	4.84	4.02	0.226	|	| O I	|	|	0.40
9.500	4.87	4.12	0.232	|	| O I	|	|	0.41
9.583	4.97	4.21	0.237	|	| O |I	|	|	0.42
9.667	5.09	4.31	0.242	|	| O |I	|	|	0.43
9.750	5.12	4.40	0.247	|	| O|I	|	|	0.44
9.833	5.21	4.49	0.252	|	| O|I	|	|	0.45
9.917	5.33	4.58	0.257	|	| O| I	|	|	0.46
10.000	5.36	4.67	0.262	|	| O I	|	|	0.47
10.083	4.78	4.71	0.265	|	| O	|	|	0.47
10.167	3.99	4.68	0.263	|	| I O	|	|	0.47
10.250	3.81	4.59	0.258	|	| I O|	|	|	0.46
10.333	3.73	4.49	0.252	|	| I O|	|	|	0.45
10.417	3.69	4.40	0.247	|	| I O|	|	|	0.44
10.500	3.67	4.32	0.243	|	| I O |	|	|	0.43
10.583	4.09	4.27	0.240	|	| O |	|	|	0.43
10.667	4.66	4.28	0.241	|	| O I	|	|	0.43
10.750	4.79	4.33	0.243	|	| O I	|	|	0.43
10.833	4.85	4.39	0.247	|	| OI	|	|	0.44
10.917	4.88	4.44	0.250	|	| OI	|	|	0.44
11.000	4.89	4.49	0.253	|	| OI	|	|	0.45
11.083	4.81	4.54	0.255	|	| OI	|	|	0.45
11.167	4.69	4.56	0.256	|	| OI	|	|	0.46
11.250	4.67	4.57	0.257	|	| OI	|	|	0.46
11.333	4.66	4.58	0.258	|	| OI	|	|	0.46
11.417	4.65	4.59	0.258	|	| OI	|	|	0.46
11.500	4.65	4.60	0.258	|	| OI	|	|	0.46
11.583	4.48	4.59	0.258	|	| O|	|	|	0.46
11.667	4.25	4.57	0.257	|	| IO|	|	|	0.46
11.750	4.20	4.53	0.255	|	| IO|	|	|	0.45
11.833	4.26	4.49	0.253	|	| IO|	|	|	0.45

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11.917    4.36    4.47      0.251  |        |      O|        |        |     0.45
12.000    4.38    4.46      0.251  |        |      O|        |        |     0.45
12.083    4.98    4.49      0.252  |        |      O|I       |        |     0.45
12.167    5.79    4.59      0.258  |        |      O|  I     |        |     0.46
12.250    5.98    4.74      0.266  |        |       O   I    |        |     0.47
12.333    6.14    4.89      0.275  |        |       O    I   |        |     0.49
12.417    6.30    5.00      0.284  |        |        |O   I   |        |     0.51
12.500    6.35    5.00      0.293  |        |        |O   I   |        |     0.54
12.583    6.61    5.00      0.303  |        |        |O    I  |        |     0.57
12.667    6.94    5.00      0.315  |        |        |O     I|        |     0.61
12.750    7.04    5.00      0.329  |        |        |O      I        |     0.65
12.833    7.20    5.00      0.343  |        |        |O      I        |     0.69
12.917    7.39    5.00      0.359  |        |        |O       |I       |     0.74
13.000    7.45    5.00      0.376  |        |        |O       |I       |     0.79
13.083    8.07    5.00      0.395  |        |        |O       |  I     |     0.85
13.167    8.89    5.00      0.419  |        |        |O       |     I  |     0.93
13.250    9.10    5.00      0.446  |        |        |O       |      I |     1.01
13.333    9.19    5.00      0.475  |        |        |O       |      I |     1.10
13.417    9.24    5.00      0.504  |        |        |O       |      I |     1.19
13.500    9.27    5.00      0.533  |        |        |O       |      I |     1.29
13.583    8.02    5.00      0.558  |        |        |O       |  I     |     1.37
13.667    6.32    5.00      0.573  |        |        |O   I   |        |     1.42
13.750    5.92    5.00      0.581  |        |        |O  I    |        |     1.44
13.833    5.75    5.00      0.587  |        |        |O I     |        |     1.46
13.917    5.66    5.00      0.592  |        |        |O I     |        |     1.47
14.000    5.63    5.00      0.596  |        |        |O I     |        |     1.49
14.083    6.08    5.00      0.602  |        |        |O  I    |        |     1.51
14.167    6.71    5.00      0.612  |        |        |O     I |        |     1.54
14.250    6.86    5.00      0.624  |        |        |O     I |        |     1.58
14.333    6.82    5.00      0.637  |        |        |O     I |        |     1.62
14.417    6.70    5.00      0.649  |        |        |O     I |        |     1.66
14.500    6.69    5.00      0.660  |        |        |O     I |        |     1.70
14.583    6.68    5.00      0.672  |        |        |O     I |        |     1.74
14.667    6.69    5.00      0.684  |        |        |O     I |        |     1.78
14.750    6.70    5.00      0.695  |        |        |O     I |        |     1.82
14.833    6.59    5.00      0.707  |        |        |O    I  |        |     1.86
14.917    6.44    5.00      0.717  |        |        |O    I  |        |     1.89
15.000    6.41    5.00      0.727  |        |        |O    I  |        |     1.92
15.083    6.29    5.00      0.736  |        |        |O   I   |        |     1.95
15.167    6.13    5.00      0.745  |        |        |O   I   |        |     1.98
15.250    6.10    5.00      0.752  |        |        |O   I   |        |     2.01
15.333    5.98    5.00      0.759  |        |        |O  I    |        |     2.03
15.417    5.82    5.00      0.766  |        |        |O  I    |        |     2.06
15.500    5.79    5.00      0.771  |        |        |O I     |        |     2.08
15.583    5.40    5.00      0.775  |        |        |OI      |        |     2.09
15.667    4.86    5.00      0.776  |        |       IO       |        |     2.09
15.750    4.74    5.00      0.775  |        |       IO       |        |     2.09
15.833    4.69    5.00      0.773  |        |       IO       |        |     2.08
15.917    4.66    5.00      0.771  |        |       IO       |        |     2.07
16.000    4.65    5.00      0.768  |        |       IO       |        |     2.06
16.083    3.39    5.00      0.761  |        |  I    |O       |        |     2.04
16.167    1.67    5.00      0.744  |    I   |       |O       |        |     1.98
16.250    1.27    5.00      0.720  |   I    |       |O       |        |     1.90
16.333    1.10    5.00      0.694  |  I     |       |O       |        |     1.81
16.417    1.02    5.00      0.667  |  I     |       |O       |        |     1.72
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16.500    0.98    5.00      0.639  |  I    |       |O      |       |     1.63
16.583    0.89    5.00      0.611  |  I    |       |O      |       |     1.54
16.667    0.78    5.00      0.582  | I     |       |O      |       |     1.44
16.750    0.75    5.00      0.553  | I     |       |O      |       |     1.35
16.833    0.74    5.00      0.524  | I     |       |O      |       |     1.26
16.917    0.74    5.00      0.495  | I     |       |O      |       |     1.16
17.000    0.73    5.00      0.465  | I     |       |O      |       |     1.07
17.083    0.90    5.00      0.437  |  I    |       |O      |       |     0.98
17.167    1.13    5.00      0.409  |  I    |       |O      |       |     0.90
17.250    1.18    5.00      0.383  |   I   |       |O      |       |     0.81
17.333    1.21    5.00      0.356  |   I   |       |O      |       |     0.73
17.417    1.22    5.00      0.330  |   I   |       |O      |       |     0.65
17.500    1.22    5.00      0.304  |   I   |       |O      |       |     0.57
17.583    1.22    4.95      0.278  |   I   |       |O      |       |     0.50
17.667    1.22    4.52      0.254  |   I   |      O|       |       |     0.45
17.750    1.22    4.14      0.233  |   I   |     O |       |       |     0.41
17.833    1.14    3.80      0.214  |  I    |    O  |       |       |     0.38
17.917    1.02    3.49      0.196  |  I    |   O   |       |       |     0.35
18.000    1.00    3.20      0.180  |  I    |  O    |       |       |     0.32
18.083    0.99    2.95      0.166  |  I    | O     |       |       |     0.29
18.167    0.98    2.72      0.153  |  I    |O      |       |       |     0.27
18.250    0.98    2.52      0.142  |  I    O       |       |       |     0.25
18.333    0.98    2.34      0.132  |  I    O       |       |       |     0.23
18.417    0.98    2.18      0.123  |  I   O|       |       |       |     0.22
18.500    0.98    2.04      0.115  |  I   O|       |       |       |     0.20
18.583    0.89    1.92      0.108  |  I  O |       |       |       |     0.19
18.667    0.78    1.79      0.101  | I   O |       |       |       |     0.18
18.750    0.75    1.67      0.094  | I  O  |       |       |       |     0.17
18.833    0.66    1.56      0.088  | I  O  |       |       |       |     0.16
18.917    0.54    1.45      0.082  |I   O  |       |       |       |     0.15
19.000    0.51    1.34      0.075  |I  O   |       |       |       |     0.13
19.083    0.58    1.25      0.070  | I O   |       |       |       |     0.13
19.167    0.69    1.18      0.066  | I O   |       |       |       |     0.12
19.250    0.71    1.12      0.063  | IO    |       |       |       |     0.11
19.333    0.81    1.08      0.061  | IO    |       |       |       |     0.11
19.417    0.93    1.06      0.059  |  O    |       |       |       |     0.11
19.500    0.96    1.05      0.059  |  O    |       |       |       |     0.10
19.583    0.89    1.03      0.058  |  O    |       |       |       |     0.10
19.667    0.78    1.01      0.057  | IO    |       |       |       |     0.10
19.750    0.75    0.98      0.055  | IO    |       |       |       |     0.10
19.833    0.66    0.95      0.053  | IO    |       |       |       |     0.09
19.917    0.54    0.91      0.051  |I O    |       |       |       |     0.09
20.000    0.51    0.86      0.049  |IO     |       |       |       |     0.09
20.083    0.58    0.83      0.046  | O     |       |       |       |     0.08
20.167    0.69    0.80      0.045  | O     |       |       |       |     0.08
20.250    0.71    0.79      0.045  | O     |       |       |       |     0.08
20.333    0.73    0.78      0.044  | O     |       |       |       |     0.08
20.417    0.73    0.78      0.044  | O     |       |       |       |     0.08
20.500    0.73    0.77      0.043  | O     |       |       |       |     0.08
20.583    0.73    0.77      0.043  | O     |       |       |       |     0.08
20.667    0.73    0.76      0.043  | O     |       |       |       |     0.08
20.750    0.73    0.76      0.043  | O     |       |       |       |     0.08
20.833    0.65    0.75      0.042  | O     |       |       |       |     0.08
20.917    0.54    0.73      0.041  |IO     |       |       |       |     0.07
21.000    0.51    0.71      0.040  |IO     |       |       |       |     0.07
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21.083	0.58	0.69	0.039	| O	|	|	|	0.07
21.167	0.69	0.68	0.038	| O	|	|	|	0.07
21.250	0.71	0.69	0.039	| O	|	|	|	0.07
21.333	0.64	0.69	0.039	| O	|	|	|	0.07
21.417	0.53	0.67	0.038	|IO	|	|	|	0.07
21.500	0.51	0.66	0.037	|IO	|	|	|	0.07
21.583	0.58	0.64	0.036	| O	|	|	|	0.06
21.667	0.69	0.64	0.036	| O	|	|	|	0.06
21.750	0.71	0.65	0.037	| O	|	|	|	0.06
21.833	0.64	0.65	0.037	| O	|	|	|	0.07
21.917	0.53	0.65	0.036	|IO	|	|	|	0.06
22.000	0.51	0.63	0.035	|IO	|	|	|	0.06
22.083	0.58	0.62	0.035	| O	|	|	|	0.06
22.167	0.69	0.62	0.035	| O	|	|	|	0.06
22.250	0.71	0.63	0.036	| O	|	|	|	0.06
22.333	0.64	0.64	0.036	| O	|	|	|	0.06
22.417	0.53	0.63	0.035	|IO	|	|	|	0.06
22.500	0.51	0.62	0.035	|IO	|	|	|	0.06
22.583	0.50	0.61	0.034	|IO	|	|	|	0.06
22.667	0.49	0.59	0.033	|IO	|	|	|	0.06
22.750	0.49	0.58	0.033	|IO	|	|	|	0.06
22.833	0.49	0.57	0.032	|O	|	|	|	0.06
22.917	0.49	0.56	0.032	|O	|	|	|	0.06
23.000	0.49	0.55	0.031	|O	|	|	|	0.06
23.083	0.49	0.55	0.031	|O	|	|	|	0.05
23.167	0.49	0.54	0.030	|O	|	|	|	0.05
23.250	0.49	0.53	0.030	|O	|	|	|	0.05
23.333	0.49	0.53	0.030	|O	|	|	|	0.05
23.417	0.49	0.52	0.029	|O	|	|	|	0.05
23.500	0.49	0.52	0.029	|O	|	|	|	0.05
23.583	0.49	0.52	0.029	|O	|	|	|	0.05
23.667	0.49	0.51	0.029	|O	|	|	|	0.05
23.750	0.49	0.51	0.029	|O	|	|	|	0.05
23.833	0.49	0.51	0.029	|O	|	|	|	0.05
23.917	0.49	0.51	0.028	|O	|	|	|	0.05
24.000	0.49	0.50	0.028	|O	|	|	|	0.05
24.083	0.32	0.49	0.028	|O	|	|	|	0.05
24.167	0.09	0.46	0.026	IO	|	|	|	0.05
24.250	0.04	0.41	0.023	IO	|	|	|	0.04
24.333	0.02	0.37	0.021	IO	|	|	|	0.04
24.417	0.01	0.33	0.018	IO	|	|	|	0.03
24.500	0.00	0.29	0.016	IO	|	|	|	0.03
24.583	0.00	0.26	0.014	O	|	|	|	0.03
24.667	0.00	0.23	0.013	O	|	|	|	0.02
24.750	0.00	0.20	0.011	O	|	|	|	0.02
24.833	0.00	0.18	0.010	O	|	|	|	0.02
24.917	0.00	0.16	0.009	O	|	|	|	0.02
25.000	0.00	0.14	0.008	O	|	|	|	0.01
25.083	0.00	0.12	0.007	O	|	|	|	0.01
25.167	0.00	0.11	0.006	O	|	|	|	0.01
25.250	0.00	0.10	0.005	O	|	|	|	0.01
25.333	0.00	0.09	0.005	O	|	|	|	0.01
25.417	0.00	0.08	0.004	O	|	|	|	0.01
25.500	0.00	0.07	0.004	O	|	|	|	0.01
25.583	0.00	0.06	0.003	O	|	|	|	0.01

25.667	0.00	0.05	0.003	O	|	|	|	|	0.01
25.750	0.00	0.05	0.003	O	|	|	|	|	0.00
25.833	0.00	0.04	0.002	O	|	|	|	|	0.00
25.917	0.00	0.04	0.002	O	|	|	|	|	0.00
26.000	0.00	0.03	0.002	O	|	|	|	|	0.00
26.083	0.00	0.03	0.002	O	|	|	|	|	0.00
26.167	0.00	0.02	0.001	O	|	|	|	|	0.00
26.250	0.00	0.02	0.001	O	|	|	|	|	0.00
26.333	0.00	0.02	0.001	O	|	|	|	|	0.00
26.417	0.00	0.02	0.001	O	|	|	|	|	0.00
26.500	0.00	0.02	0.001	O	|	|	|	|	0.00
26.583	0.00	0.01	0.001	O	|	|	|	|	0.00
26.667	0.00	0.01	0.001	O	|	|	|	|	0.00
26.750	0.00	0.01	0.001	O	|	|	|	|	0.00
26.833	0.00	0.01	0.001	O	|	|	|	|	0.00

**********HYDROGRAPH DATA**********

Number of intervals = 322
Time interval = 5.0 (Min.)
Maximum/Peak flow rate = 5.000 (CFS)
Total volume = 5.139 (Ac.Ft)

Status of hydrographs being held in storage

	Stream 1	Stream 2	Stream 3	Stream 4	Stream 5
Peak (CFS)	0.000	0.000	0.000	0.000	0.000
Vol (Ac.Ft)	0.000	0.000	0.000	0.000	0.000

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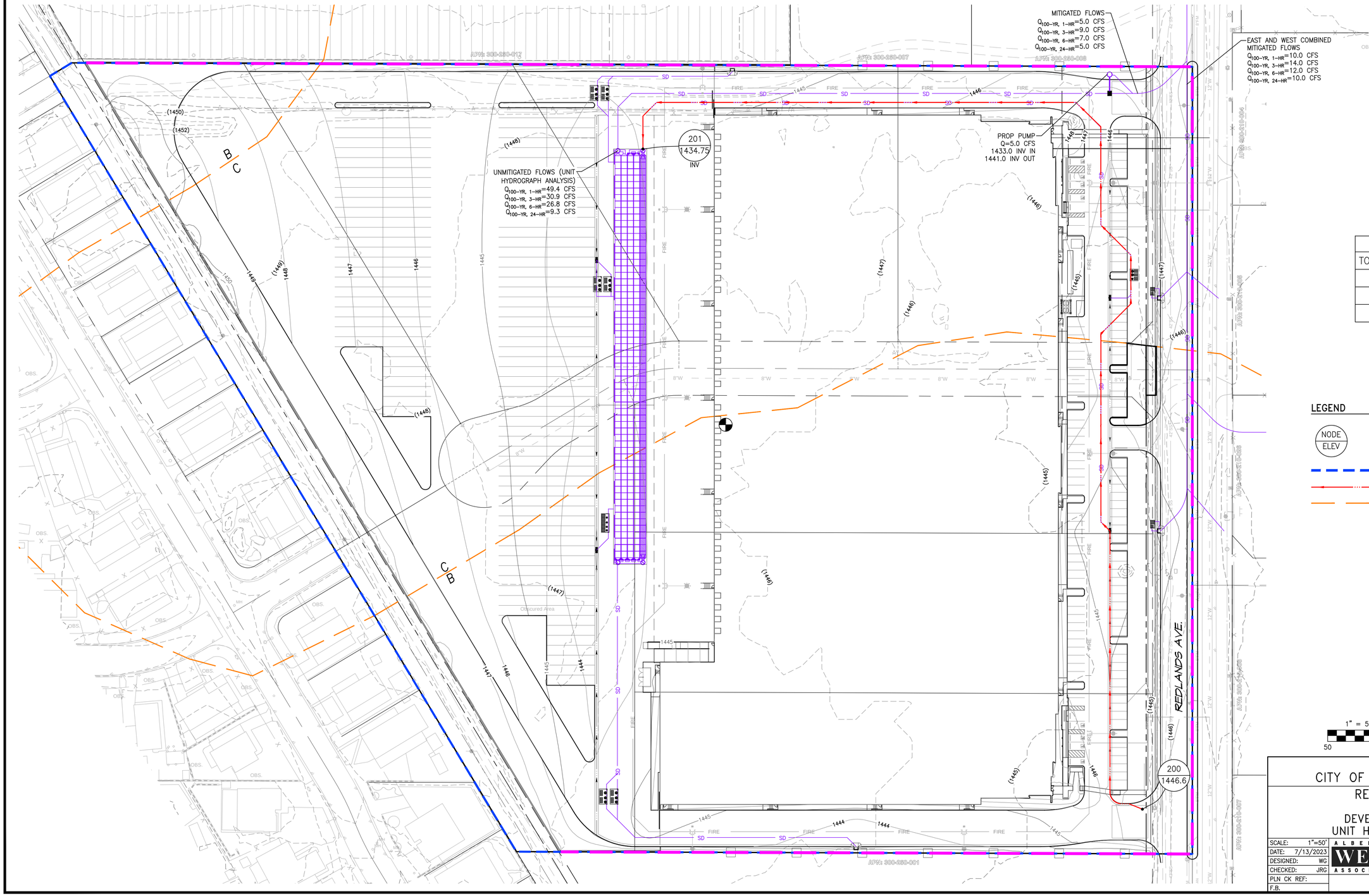
UNIT HYDROGRAPH HYDROLOGY MAPS

PRELIMINARY UNIT HYDROGRAPH MAP
REDLANDS WEST



PROPOSED	
TOTAL AREA	20.1 AC
L_T	1372 Ft
L_{CA}	918 Ft
ΔH	11.9 Ft

LEGEND

- NODE / ELEV – NODE NUMBER / ELEVATION (FT)
- DRAINAGE AREA BOUNDARY (PROPOSED)
- FLOWLINE (PROPOSED)
- NRCS SOIL BOUNDARY

N W E S

1" = 50'

50 0 50 100 150

CITY OF PERRIS, CALIFORNIA

REDLANDS WEST

DEVELOPED CONDITION
UNIT HYDROGRAPH EXHIBIT

SCALE:	1"=50'	W.O.	20-0186
DATE:	7/13/2023	SHEET	1
DESIGNED:	WG	OF	1 SHEETS
CHECKED:	JRG		
PLN CK REF:		DWG. NO.	
F.B.			

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

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APPENDIX D – REFERENCES

TECHNICAL MEMORANDUM – PERRIS VALLEY MDP: LINE A-B AND LINE A-C TRIBUTARY WATERSHED MODIFICATION

Technical Memorandum

To: Stuart E. McKibbin, P.E. (City of Perris)

From: Tyler Webb, E.I.T. (Webb)
DJ Arellano, P.E. (Webb)

Date: February 12, 2020

Re: Perris Valley MDP: Line A-B and Line A-C Tributary Watershed Modification

This technical memorandum has been prepared to document to the City of Perris and Riverside County Flood Control that the modification of tributary watersheds for Perris Valley MDP facilities Line A-B and Line A-C will not significantly impact the existing design of Line A-B or the design flow rate for the Perris Valley Storm Drain (PVSD). Master Drainage Plans are prepared based on the best data available at the time, and they provide guidance on how drainage in a particular area can be handled. It is often the case that development patterns required the modification of MDPs. Perris Valley Line A-B was designed by Thienes Engineering in conjunction with the development of an industrial building that is located on the southwesterly side of the intersection of Rider Street and Redlands Avenue. The design was sized based on assumed land uses and drainage strategies for the tributary watershed. Subsequent to the construction of Line A-B, several additional industrial buildings have either been constructed, or are planned to be constructed. The drainage design for these sites, coupled with site specific drainage strategies, has resulted in reduced flow rates for Line A-B compared to the original design assumptions. This memo documents the changes from the original design assumptions and proposes to introduce additional tributary area into Line A-B to take advantage of the unused capacity in the facility. This is done in such a manner that the peak design flows of PVSD are not changed and the tributary area for Line A-C can be reduced. This change in the MDP will accommodate the forthcoming construction of RCTC's Mid-County Parkway as well.

Section 1-A: Line A-B Capacity

Line A-B is located in Rider Street and has been constructed to accommodate the peak flowrates determined by Thienes Engineering when they designed the facility. As-built plans, to the intersection of Rider Street and Perris Boulevard, are included as part of this memorandum as reference. The facility is designed to accommodate runoff as depicted in the line A-B rational method map and analysis completed by Thienes Engineering (see Appendix A).

The proposed modification of tributary watershed areas, and the corresponding peak flow rates were determined using an area-yield analysis. The yield is based on the Line A-B rational method map and analysis stated above. The average yield was rounded up to the nearest whole number of 2.0 cfs/acre to conservatively calculate the peak flow rates (see Appendix A for modified drainage areas).

Hydraulic models were developed, based on the as-built plans for Line A-B. One model used the modified flow rates (revised model) determined using the methodology outlined above. The revised model was compared to a model using the original tributary flowrates (original model) to determine if Line A-B has adequate capacity. The hydraulic models were only completed to just before Lateral AB-11; this is because the tributary flowrates upstream of Lateral AB-10 remained unchanged. It should be noted that the revised model shows an increase in total flowrate for Line A-B; the area-yield method does not utilize confluences between the laterals and Line A-B which can lower the total flowrate by considering the time of concentration. The initial HGL for this model was taken from the ultimate Perris Valley Storm Drain Channel plans and double checked with the initial HGL in the Line A-B as-built plans, which both match and use the NGVD29 datum. The hydraulic analyses of Line A-B, even the one initially conducted by Thienes Engineering, assume ultimate improvements of the Channel have been completed. Capacity will be limited until the ultimate Channel improvements have been made.

The following are brief descriptions of the revised laterals for reference: **Lateral AB-1** is unchanged, **Lateral AB-2** is the single discharge point for the Rider II Distribution Center (DPR No. 19-00004) and removes flow from laterals AB-3 and AB-6, **Lateral AB-4** is the single discharge point for the Core 5 Rider Industrial project (DPR No. 19-05267) and removes flow from laterals AB-5 and AB-7, **Lateral AB-7.5** is the single discharge point for the FIR Rider Industrial project (DPR No. 19-05161) and removes flow from Lateral AB-8, **Lateral AB-9** is the single discharge point for the constructed Rider III Distribution Center which will discharge via pump at a constant 8 cfs instead of the original gravity flow of 61 cfs, **Lateral AB-10** will not remove flow from any laterals and be extended further south to add an additional 33 cfs.

Table 1 shows the HGL's (NGVD29) and total tributary flowrates at significant points for the original and revised Line A-B hydraulic models. For reference, Line A-B is an 8'x7' RCB from STA. 9+97.60 (outlet) to STA. 17+77.51 (Lateral AB-4), an 8'x6' RCB from STA. 17+77.51 (Lateral AB-4) to STA. 30+93.93 (Lateral AB-9), and a 7'x5' RCB from STA. 30+93.93 (Lateral AB-9) to the end of the model.

Table 1 – Line A-B hydraulics

Station and Lateral	Lateral Q's Original/Revised (cfs)	Line A-B Original Model HGL/Q* (ft/cfs)	Line A-B Revised Model HGL/Q* (ft/cfs)	Line A-B Revised minus Original ΔHGL/ΔQ (ft/cfs)
9+97.60 (Outlet)	--	1433.0/483.0	1433.0/506.1	0.0/23.1
12+63.33 (Lat AB-1)	21.1/21.1	1433.9/461.9	1434.0/485.0	0.1/23.1
12+75.33 (Lat AB-2)	15.9/87.0	1434.2/446.0	1434.7/398.0	0.5/-48.0
17+71.51 (Lat AB-4)	12.8/25.0	1435.0/413.0	1434.9/373.0	-0.1/-40.0
25+00.00 (Lat AB-7.5)	0.0/35.0	**1437.5/367.0	1437.4/338.0	-0.1/-29.0
30+83.49 (Lat AB-9)	61.0/8.0	1439.1/295.0	1438.1/330.0	***-1.0/35.0
31+16.47 (Lat AB-10)	13.0/48.0	1439.4/282.0	1439.2/282.0	-0.2/0.0

*Q is the flowrate in Line A-B directly upstream of the lateral junction
**Approximate HGL for proposed Lat AB-7.5 in the original model
***HGL is lower with higher Q because of downstream hydraulic jump, flow at Lat AB-9 is super critical

Per the results above, the flow reallocation will not significantly impact the hydraulics in Line A-B. The greatest HGL increase of 0.5-feet was located at Lateral AB-2 (Rider II Distribution Center outlet); all other HGL changes either decreased or were insignificant. This means the Line A-B HGL will not rise above the Rider Street pavement surface as previously designed. It should be mentioned that the revised lateral hydraulics will need to be analyzed separately with the construction of the proposed projects, and they might need to be upsized given the onsite designs.

See Appendix B for the Line A-B hydraulic calculations and plan and profile.

See Appendix D for the Line A-B as-built plans for reference.

See Appendix E for Ultimate Perris Valley Storm Drain Channel plans for reference.

Section 1-B: Line A-C Capacity

Line A-C is a proposed storm drain line whose MDP alignment is disrupted by the Mid County Parkway. As stated above, the tributary areas for Line A-C and Line A-B will be reduced because of this. The modified area for Line A-C was roughly cut in half from the original MDP area; it is our understanding through preliminary correspondence with Mark Lancaster at Riverside County Transportation Commission (RCTC), that the Mid County Parkway will address its own generated runoff by constructing and draining to MDP facility Line H. The proposed tributary flowrate to Line A-C was calculated using area-yield method of 2.0 cfs/acre which yields a total flowrate of 72.6 cfs (see Appendix A for reallocated drainage areas).

A preliminary hydraulic model, in NAVD88, was developed to analyze the proposed alignment and profile of Line A-C. The initial HGL for this model was taken from the ultimate Perris Valley Storm Drain Channel plans, which use the NGVD29 datum and were converted to NAVD88 (NAVD88 = NGVD29 + 2.6'). The hydraulic analysis of Line A-C assumes ultimate improvements of the PVSD have been completed. Capacity will be limited, just like other Channel connections, until the ultimate PVSD improvements have been completed. Based upon our analysis a 42-inch storm drain downstream and 36-inch storm drain upstream will adequately convey the modified flow; the HGL will be below the street and ground surface, and the facilities should provide backbone drainage for the tributary area.

See Appendix C for Line A-C hydraulic calculations and plan and profile.

See Appendix E for Ultimate Perris Valley Storm Drain Channel plans for reference.

Section 2: Impacts to the Perris Valley Storm Drain Channel

Per the area-yield flow analysis, an additional 23.1 cfs will be added upstream to the Perris Valley Storm Drain Channel via Line A-B. This change is insignificant – roughly 0.17% of the peak design flow of the Perris Valley Storm Drain Channel. This is especially inconsequential since variations in the peak flow timing were not considered.

Section 3: Conclusions

Per the hydrologic and hydraulic analyses listed above, we conclude that the revised MDP tributary areas and updated flowrates will not significantly impact the hydraulics of Line A-B. The greatest increase in HGL is only 6-inches, which remains well under the Rider Street pavement surface. The change in HGL at other

stations was either negligible or decreased. Also, the proposed alignment and profile of Line A-C will work hydraulically with the updated flow rates.

The Perris Valley Storm Drain Channel will not be impacted hydraulically since the increase in tributary flow reallocated upstream is one-one thousandth of a percent of the 100-year design flow per the MDP. Finally, this update is consistent with the forthcoming impacts of RCTC's Mid County Parkway to the original MDP drainage areas. It is our understanding through preliminary correspondence with Mark Lancaster at RCTC, that Mid County Parkway will accommodate their own generated runoff by constructing and draining to MDP facility Line H.

Should you have any questions regarding this analysis, please give me a call at (951) 320-6039 or email me at tyler.webb@webbassociates.com

Appendix A: Original and Revised Hydrology

SINCLAIR STREET

EXISTING N'LY 1/2 OF SINCLAIR

FLOW IN STREET

FLOW IN STREET

EXISTING RIBBON GUTTER

FLOW

EXISTING VEGETATED SWALE

FLOW

SPILLOVER FROM CHANNEL (TO N.)

FLOW

FLOW

PERRIS BLVD.

SEE PERRIS VALLEY HYDROLOGY FOR LATERAL H-1

100

6.00 AC.

6.60 AC.

7.10 AC.

103 Q100=38.2 CFS Tc=18.6 MIN.

101 Q100=12.7 CFS Tc=12.5 MIN.

102 Q100=25.5 CFS Tc=15.8 MIN.

5.00 AC.

6.20 AC.

5.80 AC.

190

191 Q100=13.0 CFS Tc=8.3 MIN.

192 Q100=27.5 CFS Tc=10.4 MIN.

193 Q100=40.3 CFS Tc=11.8 MIN.

3.90 AC.

104 Q100=62.0 CFS Tc=19.7 MIN.

13.7 AC.

13.1 AC.

194 Q100=72.0 CFS Tc=15.4 MIN.

120

2.70 AC.

4 Q100=133.3 CFS Tc=18.5 MIN.

121 Q100=6.0 CFS Tc=11.4 MIN.

2.30 AC.

122 Q100=10.5 CFS Q(in basin)=9.4 CFS Tc=14.8 MIN.

123 Q100(conf)=164.5 CFS Tc=20.8 MIN.

LAT. "A-18"

130 140 1.1 CFS FLOWBY

LAT. "A-16"

Q100=225.6 CFS Tc=21.3 MIN.

124

4.20 AC.

141 Q100=8.3 CFS Q(in basin)=7.6 CFS Tc=14.9 MIN.

LAT. "A-14"

132 Q100=227.2 CFS Tc=22.6 MIN.

Q100=234.1 CFS Tc=22.7 MIN.

142

2.20 AC.

Q100=282.1 CFS Tc=23.3 MIN.

172

170

171 Q100=5.0 CFS Q(in basin)=6.8 CFS Tc=10.8 MIN.

LAT. "A-20"

RIDER STREET

0.70 AC.

LAT. "A-17" 11.5 CFS FLOWBY

LAT. "A-15"

Q100=277.4 CFS Tc=22.8 MIN.

154 1.8 CFS FLOWBY

LAT. "A-11"

LAT. "A-13" 6.5 CFS FLOWBY

0.70 AC.

LAT. "A-12"

LAT. "A-9"

111 Q100=6.3 CFS Tc=11.8 MIN.

113 Q100=155.4 CFS Tc=20.8 MIN.

LAT. "A-19"

112 Q100=25.2 CFS Q(in basin)=13.7 CFS Tc=15.5 MIN.

1.00 AC.

131 Q100=2.0 CFS Q(in basin)=7.0 CFS Tc=14.8 MIN.

160 162 Q100=278.5 CFS Tc=23.3 MIN. Q100=1.7 CFS Q(in basin)=8.2 CFS Tc=10.2 MIN.

161

LAT. "A-10"

181 Q100=15.4 CFS Tc=15.4 MIN.

201

Q100=35 Tc=23.7

Q100=294 Tc=23.6

2.90 AC.

80 110

9.70 AC.

153 Q100=49.4 CFS Tc=28.4 MIN.

7.90 AC.

9.6 AC.

4.40 AC.

3.60 AC.

151 Q100=29.6 CFS Tc=24.9 MIN.

152 Q100=35.1 CFS Tc=26.0 MIN.

180

200

REDLANDS AVENUE

2.90 AC.

90

2.10 AC.

91 Q100=4.0 CFS Tc=14.2 MIN.

1.80 AC.

Q100=5.9 CFS Tc=12.3 MIN.

81

92 Q100=22.5 CFS Tc=23.5 MIN.

0.10 AC.

Q100=22.7 CFS Tc=24.4 MIN.

93

SEE SHEET NO. 2

SINCLAIR STREET

RIDER STREET

REDLANDS AVENUE

PERRIS VALLEY CHANNEL

SEE SHEET NO. 1

IRON CHANNEL (TO THE NORTH)

OFFSITE RUNOFF SHEET FLOWS EAST

OFFSITE RUNOFF SHEET FLOWS EAST

EXISTING BERM

EXISTING BERM

FLOW

FLOW

220

240

250

3.90 AC.

10.0 AC.

6.70 AC.

4.70 AC.

241 Q100=13.4 CFS Tc=14.5 MIN.

251 Q100=8.9 CFS Tc=16.3 MIN.

221 Q100=19.6 CFS Tc=15.1 MIN.

5.90 AC.

10.9 AC.

6.40 AC.

.0 CFS
MIN.

8 CFS

Q100=282.1 CFS Tc=23.3 MIN. 172

LAT. "A-9"

202 Q100=367.1 CFS Tc=24.3 MIN.

222 Q100=40.1 CFS Tc=16.8 MIN.

212 Q100=377.9 CFS Tc=25.0 MIN.

LAT. "A-6"

232 Q100=424.0 CFS Tc=25.7 MIN.

Q100=24.8 CFS Q100(conf)=445.6 CFS Tc=25.7 MIN. 242

LAT. "A-3"

252 Q100=18.7 CFS Q100(conf)=462.7 CFS Tc=26.4 MIN.

Q100=482.9 CFS Tc=26.4 MIN. 262

LAT. "A-2"

LAT. "A-12"

LAT. "A-8"

LAT. "A-7"

LAT. "A-5"

LAT. "A-4"

LAT. "A-1"

201 Q100=14.8 CFS Tc=13.7 MIN.

211 Q100=13.8 CFS Tc=14.6 MIN.

Q100=411.4 CFS Tc=25.0 MIN. 223

Q100=15.7 CFS Tc=15.6 MIN. 231

261 Q100=24.9 CFS Tc=16.6 MIN.

LAT. "A-10"

Q100=355.6 CFS Tc=23.7 MIN. 195

Q100=294.8 CFS Tc=23.6 MIN. 182

6.90 AC.

5.4 CFS
4 MIN.

7.20 AC.

8.10 AC.

13.2 AC.

AC.

200

210

230

260

LEGEND

- ORIGINAL LINE A–B, LINE A–C BOUNDARY
- EXISTING STORM DRAIN
- SD — PLANNED STORM DRAIN
- UNDEVELOPED/DEVELOPED AREA CURRENTLY TRIBUTARY TO LINE A–B
- UNDEVELOPED/DEVELOPED AREA CURRENTLY TRIBUTARY TO LINE A–C

EXISTING LINE A–B

DETENTION BASIN

EXISTING LINE A–B

332,555 SF

LINE A–C MASTER DRAINAGE PLAN ALIGNMENT

N

E

S

WEBB

1" = 200'

100 0 200 400 600

CITY OF PERRIS

LINE A–C ORIGINAL TRIBUTARIES

SCALE: AS SHOWN	ALBERT A. WEBB ASSOCIATES	ENGINEERING CONSULTANTS 3788 McCRAY STREET RIVERSIDE CA. 92506 PH. (951) 686-1070 FAX (951) 788-1256	W.O. 18-0305
DATE: 1/30/20			SHEET 1
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LEGEND

- PROPOSED LINE A–B BOUNDARY
- PROPOSED LINE A–C BOUNDARY
- PROJECT BOUNDARIES
- EXISTING STORM DRAIN
- PLANNED STORM DRAIN (SD)
- UNDEVELOPED/DEVELOPED AREA CURRENTLY TRIBUTARY TO LINE A–B
- RIDER DISTRIBUTION CENTER III – MITIGATES FLOWS FROM 72 CFS TO 8 CFS
- AREA PROPOSED TRIBUTARY TO LINE A–C
- UNDEVELOPED AREA PROPOSED TRIBUTARY TO LATERAL AB–10
- UNDEVELOPED AREA PROPOSED TRIBUTARY TO LATERAL AB–7
- UNDEVELOPED AREA PROPOSED TRIBUTARY TO LATERAL AB–4
- RCTC MID COUNTY PARKWAY IMPACT AREA
- 10.0 — DRAINAGE AREA

(CONSTRUCTED)

37.2

Q_{100}= 8.0 CFS

EX. LAT AB–9
OLD=61.0 CFS
NEW=8.0 CFS

RIDER DISTRIBUTION CENTER II
PROJECT TRIBUTARY TO LATERAL AB–2

DPR NO. 19–00004

42.2

EX. LAT AB–6
OLD=32.7 CFS
NEW=0.0 CFS

EX. LAT AB–3
OLD=20.2 CFS
NEW=0.0 CFS

DETENTION BASIN

EX. LAT AB–2
OLD=15.9 CFS
NEW=87.0 CFS

EX. LINE A–B

EX. LAT AB–1
NO CHANGE

EX. LAT AB–4
OLD=12.8 CFS
NEW=25.0 CFS

EX. LAT AB–5
OLD=2.0 CFS
NEW=0.0 CFS

RIDER DISTRIBUTION CENTER I PROJECT
TRIBUTARY TO LATERAL AB–13

(CONSTRUCTED)

17.4

PROP. LAT AB–7.5
OLD=0.0 CFS
NEW=34.6 CFS

FIRST RIDER INDUSTRIAL
PROJECT TRIBUTARY TO
LATERAL AB–7

5 RIDER INDUSTRIAL
CT TRIBUTARY TO
AL AB–4

R NO. 19–05267

12.5

2.5 ACRES * 2.0 CFS/ACRE)

Q_{100}=(17.3 ACRES * 2.0 CFS/ACRE)
= 34.6 CFS

9.6

Q_{100}=(9.6 ACRES * 2.0 CFS/ACRE)
= 19.2 CFS

PROP.
LINE A–C

EX. LINE A–B OUTLET
OLD=483.0 CFS
*NEW=506.1 CFS

IPT – REDLANDS PROJECT
TRIBUTARY TO LAT AB–10

16.3

Q_{100}=(16.3 ACRES * 2.0 CFS/ACRE) = 32.6 CFS

PROPOSED AREA
TRIBUTARY TO LINE A–C

11.1

Q_{100}=(11.1 ACRES * 2.0 CFS/ACRE) = 22.2 CFS

LINE A–C TRIBUTARY TOTALS
72.6 CFS

FIRST WILSON INDUSTRIAL
PROJECT TRIBUTARY TO LINE A–C

DPR NO. 19–00007

15.6

Q_{100}=(15.6 ACRES * 2.0 CFS/ACRE) = 31.2 CFS

LOTS TRIBUTARY TO (SD)

MID COUNTY PARKWAY IMPACT AREA,
PARKWAY WILL DRAIN TO AND
CONSTRUCT LINE H

*NOTE
NEW OUTLET FLOWRATE IS GREATER THAN OLD OUTLET FLOWRATE BECAUSE OF AREA–YIELD FLOW REALLOCATION METHOD. THIS WAS DONE TO BE MORE CONSERVATIVE IN THE REVISED HYDRAULIC MODEL EVALUATION. THE AREA–YIELD METHOD IS MORE CONSERVATIVE BECAUSE IT IGNORES STREAM CONFLUENCES WHICH CAN LOWER THE TRIBUTARY FLOWRATES.

N
E
S
WEBB

1" = 200'
100 0 200 400 600

CITY OF PERRIS

LINE A–C
PROPOSED TRIBUTARIES

SCALE:	AS SHOWN	ALBERT A. WEBB ASSOCIATES	ENGINEERING CONSULTANTS 3788 McCRAY STREET RIVERSIDE, CA. 92506 PH. (951) 686–1070 FAX (951) 788–1256
DATE:	1/30/20		
DESIGNED:	TSW		
CHECKED:	DJA		
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F.B.			

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OF 2 SHEETS
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TM ERW

MDP LINE A-B AS-BUILT PLANS

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

INDEX

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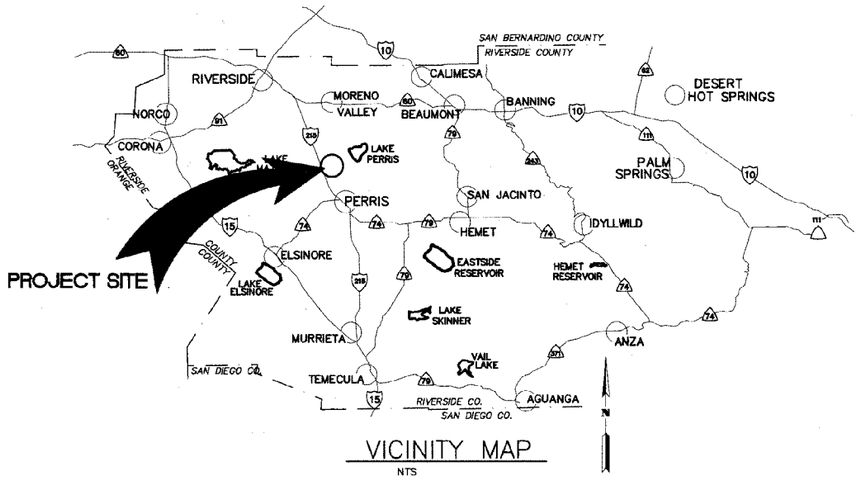
LATERAL PROFILES	14–17
DETAILS	18



VICINITY MAP
NTS

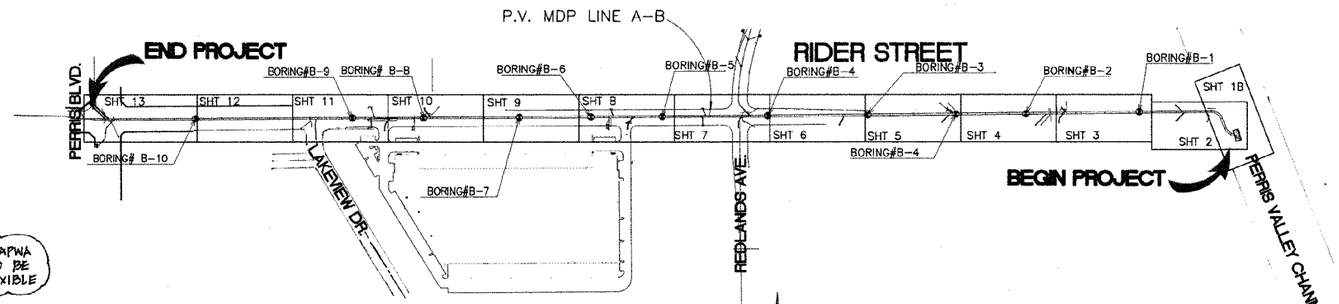
THE ULTIMATE H.C.L. IS BASED ON THE ADOPTED MDP WATER SURFACE ELEVATION OF 1433 IN THE PERRIS VALLEY STORM CHANNEL (PVSC) AT RIDER STREET, AND ASSUMES THAT FULL CHANNEL IMPROVEMENTS HAVE BEEN CONSTRUCTED PER THE ADOPTED MDP. FOR ALL WATER SURFACE ELEVATIONS BETWEEN 1433 AND THE 100-YEAR FLOOD ELEVATION FOR PVSC (1437.5), LINE "A-B" WILL NOT HAVE CAPACITY FOR LOCAL 100-YEAR FLOWS.

LEGEND:

ℙ	—PROPERTY LINE
R/W	—RIGHT OF WAY
℄	—CENTERLINE
T.C.	—TOP OF CURB
F.L.	—FLOW LINE
F.S.	—FINISH SURFACE
H.P.	—HIGH POINT
F.F.	—FINISH FLOOR
R.C.P.	—REINFORCED CONCRETE PIPE
INV.	—INVERT
S =	—SLOPE
F.G.	—FINISH GRADE
S.D.	—STORM DRAIN
ST.LT.	—STREET LIGHT
G.B.	—GRADE BREAK
H.P.	—HIGH POINT
E.C.	—EDGE OF CONCRETE
G.A.	—GUY ANCHOR
A.B.	—AGGREGATE BASE
F.H.	—FIRE HYDRANT
P.P.	—POWER POLE
C.B.	—CATCH BASIN
R=	—RATE OF GRADE
B.C.R.	—BEGIN OF CURB RETURN
E.C.R.	—END OF CURB RETURN
L.P.	—LOW POINT
T.O.P.	—TOP OF PIPE
B.O.P.	—BOTTOM OF PIPE
R	—RATE OF GRADE
T.F.	—TOP OF FOOTING
T.W.	—TOP OF WALL
S.F.	—SQUARE FEET
C.F.	—CURB FACE
F.P.	—FINISHED PAVEMENT
S.F.O.W	—SOUTH FACE OF WALL
N.F.O.W	—NORTH FACE OF WALL
E.F.O.W	—EAST FACE OF WALL
W.F.O.W	—WEST FACE OF WALL
T.P.	—TOP OF PIPE
(0.00)	—EXISTING ELEVATION
B.O.W.	—BOTTOM OF WALL
T.C.	—TOP OF CRATE
N.C.	—NATURAL GRADE
TOP	—TOP OF SLOPE
TOE	—TOE OF SLOPE
E.P.	—EDGE OF PAVEMENT
A.C.	—ASPHALT CONCRETE
C.L.F.	—CHAIN LINK FENCE
CONC.	—CONCRETE
PKWY DRAIN	—PARKWAY DRAIN
EXIST.	—EXISTING
EMH	—EDISON MANHOLE
M.H.	—MANHOLE
T.B.	—TOP OF BERM
E.T.W.	—EDGE OF TRAVELWAY
B.W.	—BACK OF WALK
TC-TX	—TOP OF CURB@DRIVEWAY
TC-BX	—BOT. OF CURB@DRIVEWAY
⊕	—BORING LOCATION
1	—REVISION SYMBOL AND NUMBER PER EMWD REQUIREMENT
1 —RCFD & WCD REVISION	

GENERAL NOTES

1. THE CONTRACTOR SHALL CONSTRUCT THE FLOOD CONTROL IMPROVEMENTS SHOWN ON THE DRAWINGS IN CONFORMANCE WITH THE REQUIREMENTS OF THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT'S M.O.U. STANDARD SPECIFICATIONS DATED JUNE 24, 2008, AND RCFC&WCD STANDARD MANUAL. FOR THE LATEST DRAWINGS OF THE STANDARD MANUAL, PLEASE REFER TO THE "PUBLICATIONS AND RECORDS" PAGE FOUND ON THE DISTRICT'S WEBSITE.
2. CONTACT THE ENCROACHMENT PERMIT ENGINEER AT 951.955.1266 IF AN ENCROACHMENT PERMIT IS REQUIRED FROM RIVERSIDE COUNTY FLOOD CONTROL. AFTER THE PERMIT IS ISSUED THE DISTRICT MUST BE NOTIFIED ONE WEEK PRIOR TO CONSTRUCTION.
3. CONTACT CONTRACT ADMINISTRATION AT 951.955.1288 IF CONSTRUCTION INSPECTION WILL BE PERFORMED BY RIVERSIDE COUNTY FLOOD CONTROL. THE DISTRICT MUST BE NOTIFIED TWENTY DAYS (2D) PRIOR TO CONSTRUCTION.
4. ALL STATIONING REFERS TO CENTERLINE OF CONSTRUCTION UNLESS OTHERWISE NOTED.
5. STATIONING FOR LATERALS AND CONNECTOR PIPE REFER TO THE CENTERLINE INTERSECTION STATIONS.
6. FORTY-EIGHT HOURS BEFORE EXCAVATION, CALL UNDERGROUND SERVICE ALERT 1.800.227.2600.
7. ALL ELEVATIONS SHOWN ARE IN FEET AND DECIMALS THEREOF BASED ON THE NORTH AMERICAN VERTICAL DATUM (NAVD 1929).
8. ALL COORDINATES ARE SHOWN IN FEET AND DECIMALS THEREOF BASED ON THE NORTH AMERICAN DATUM (NAD 83), CALIFORNIA COORDINATE SYSTEM (CCS), ZONE 6 AND EPOCH 2011.00.
9. ALL CROSS SECTIONS ARE TAKEN LOOKING DOWNSTREAM.
10. ELEVATIONS OF UTILITIES ARE APPROXIMATE UNLESS OTHERWISE NOTED.
11. UNLESS OTHERWISE SPECIFIED, MINIMUM STREET RECONSTRUCTION SHALL BE 4" TYPE "B" HOT MIX ASPHALT OVER 6" CLASS 2 AGGREGATE BASE OR AS SPECIFIED BY THE ENGINEER
12. OPENINGS RESULTING FROM THE CUTTING OR PARTIAL REMOVAL OF EXISTING CULVERTS, PIPES OR SIMILAR STRUCTURES TO BE ABANDONED SHALL BE SEALED WITH 6" OF CLASS "B" CONCRETE.
13. PIPE CONNECTED TO THE MAINLINE PIPE SHALL CONFORM TO JUNCTION STRUCTURE NO. 4 (JS 229) UNLESS OTHERWISE NOTED.
14. PIPE BEDDING SHALL CONFORM TO RCFC&WCD STD. DWG. 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.
15. BH-1 INDICATES SOIL BORING LOCATIONS BASED ON THE SOILS REPORT DATED 11-19-2009. LOCATIONS SHOWN ARE APPROXIMATE.
16. "V" IS THE DEPTH OF CATCH BASINS MEASURED FROM THE TOP OF CURB TO INVERT OF CONNECTOR PIPE.
17. CATCH BASINS SHALL BE LOCATED SO THAT LOCAL DEPRESSION SHALL BEGIN AT EXISTING CURB RETURN JOINT, UNLESS OTHERWISE SPECIFIED.
18. ALL CURBS, GUTTERS, SIDEWALKS, DRIVEWAYS AND OTHER EXISTING IMPROVEMENTS TO BE RECONSTRUCTED IN KIND AND AT THE SAME ELEVATION AND LOCATION AS THE EXISTING IMPROVEMENTS UNLESS OTHERWISE NOTED.
19. STANDARD DRAWINGS CALLED FOR ON THE PLAN AND PROFILE SHALL CONFORM TO DISTRICT STANDARD DRAWINGS UNLESS NOTED OTHERWISE.
20. THE CONTRACTOR IS REQUIRED TO CALL ALL UTILITY AGENCIES REGARDING TEMPORARY SHORING AND SUPPORT REQUIREMENTS FOR THE VARIOUS UTILITY LINES SHOWN ON THESE PLANS.
21. DURING ROUGH GRADING OPERATIONS AND PRIOR TO CONSTRUCTION OF PERMANENT DRAINAGE STRUCTURES, TEMPORARY DRAINAGE CONTROL SHOULD BE PROVIDED TO PREVENT PONDING WATER AND DAMAGE TO ADJACENT PROPERTIES.
22. APPROVAL OF THESE PLANS BY THE RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT DOES NOT RELIEVE THE DEVELOPER'S 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.
23. THE CONTRACTOR OR DEVELOPER SHALL SECURE ALL REQUIRED ENCROACHMENT AND/OR STATE AND FEDERAL REGULATORY PERMITS PRIOR TO THE COMMENCEMENT OF ANY WORK.
24. THE CONCRETE COATING IN THE INSIDE OF ALL REINFORCED CONCRETE PIPES MUST BE INCREASED TO PROVIDE A MINIMUM OF 1-1/2 INCHES OVER THE REINFORCING AND INCREASED TO A MINIMUM OF 3-1/2 INCHES OVER REINFORCING FOR BOX CULVERT, WHEN DESIGN VELOCITIES EXCEED 20 FEET PER SECOND. THE CONCRETE DESIGN STRENGTH IN THESE REACHES SHALL BE F'C=5,000 PSI FOR VELOCITIES EXCEEDING 20 FEET PER SECOND AND F'C=6,000 PSI FOR VELOCITIES EXCEEDING 30 FEET PER SECOND.
25. CONSTRUCTION JOINTS FOR CALTRANS STANDARD REINFORCED CONCRETE BOX SHALL BE PLACED ACCORDING TO RCFC&WCD STANDARD DRAWING NO. BOX 401.



INDEX MAP
1"=300'

1 NOTE:
FOR PRE-CAST RCB, USE JOINT SEALANT PER APWA STD PLAN 330.0 ALL PRE-CAST RCB JOINTS TO BE SEALED WITH RUBBER BASED PRE-FORMED FLEXIBLE JOINT SEALANT AND CEMENT MORTAR.

SURVEY MONUMENT NOTES:
EXISTING C/L INTERSECTION MONUMENTS SHALL BE TIED WITH PRE-CONSTRUCTION TIE NOTES FILED WITH THE COUNTY OF RIVERSIDE. POST CONSTRUCTION MONUMENTS TO BE SET, AND POST CONSTRUCTION TIE NOTES TO BE FILED WITH THE COUNTY OF RIVERSIDE

Don't Dig...Until You Call U.S.A. Toll Free
1-800-227-2600
for the location of buried utility lines.
Don't disrupt vital services.
TWO WORKING DAYS BEFORE YOU DIG

AEL 4/6/14

MS 94

CITY OF PERRIS
FILE NO. P8-1013

BENCH MARK
COUNTY OF RIVERSIDE BENCHMARK NO. "M-31"
COUNTY OF RIVERSIDE BENCHMARK - 3 1/4" ALUMINUM DISK MARKED M-31, LOCATED 11.50 M.W. OF THE SOUTH WEST CORNER OF BRIDGE ON TOP OF SIDEWALK NEAR FACE OF CURB LOCATED AT THE CROSSING OF PERRIS BLVD. AND RIV. CO. FLOOD CONTROL CHANNEL (PERRIS LATERAL 2-7) 43 FT. WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE BARRIER. (EDGE OF BRIDGE) MARKED R-103 D.W.R. IN TOP OF CONC. POST FLUSH W/ GROUND
ELEVATION = 1474.674' (NAVD 1929)

REF.	REVISIONS	ENGINEER APPR.	ENGINEER DATE	RCFC/ APPR.	RCFC/ DATE
2	CHANGED SLOPE TO C.O.D.B, ADDED MH, ADDED NEW 10'S, CHANGED 42" LAT TO 24" LAT, ADDED BY. UTILITIES, RELOCATE UTILITIES, REV. 3D.	H.I.A.	1/5/16	OK	2/23/16
1	CHANGED C.I.P. RCB TO PRE-CAST RCB PER APWA 330.0	H.I.A.	2/9/16	OK	2/23/16

DESIGNED BY: BW
DRAWN BY: ET
DATE DRAWN:

APPROVED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173
HAIDOOK I. AGHAIAN Date: 11/18/14
RCE NO. 43293

REGISTERED PROFESSIONAL ENGINEER HAIDOOK I. AGHAIAN RCE. NO. 43293 Exp. 3-31-16 CIVIL STATE OF CALIFORNIA

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: Mark A. Wills PLANNING ENGINEER DATE: 1/20/2015
APPROVED BY: CHIEF ENGINEER DATE: 1/20/15

CITY OF PERRIS
APPROVED BY:
CITY ENGINEER DATE: 12-15-14
RECOMMENDED DATE:

PERRIS VALLEY MDP LINE "A-B"

PROJECT NO. 4-0-00537
DRAWING NO. 4-1063
SHEET NO. 1 OF 18

Last Update: 11/18/14
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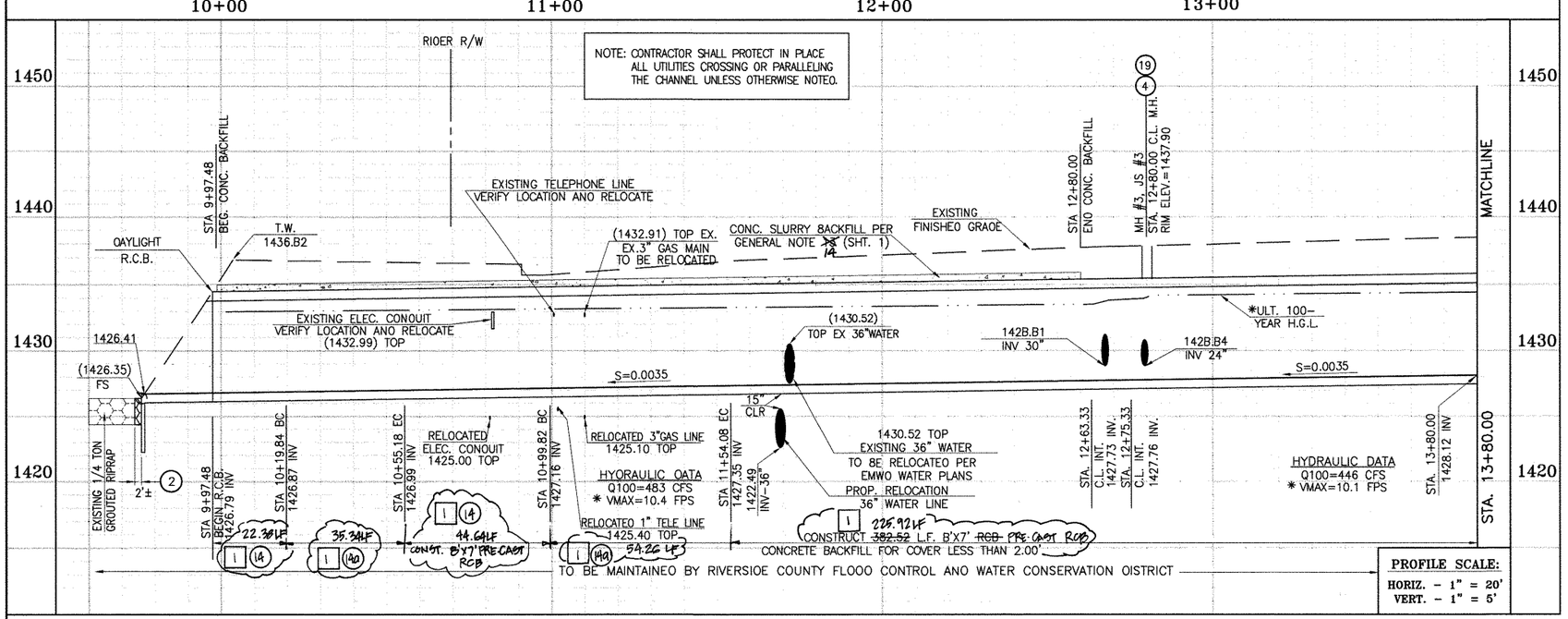
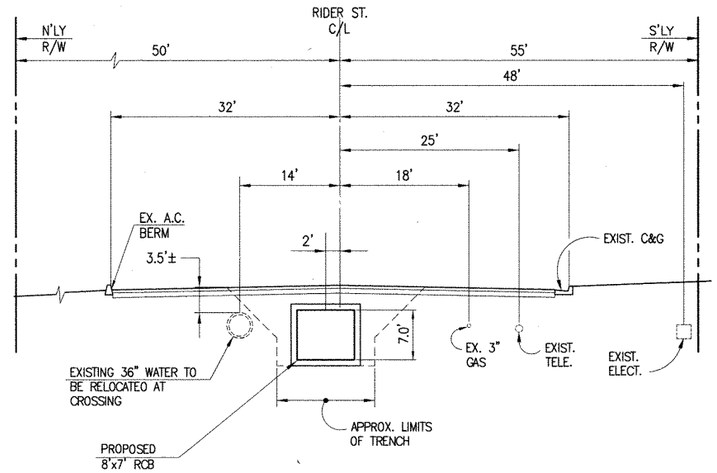


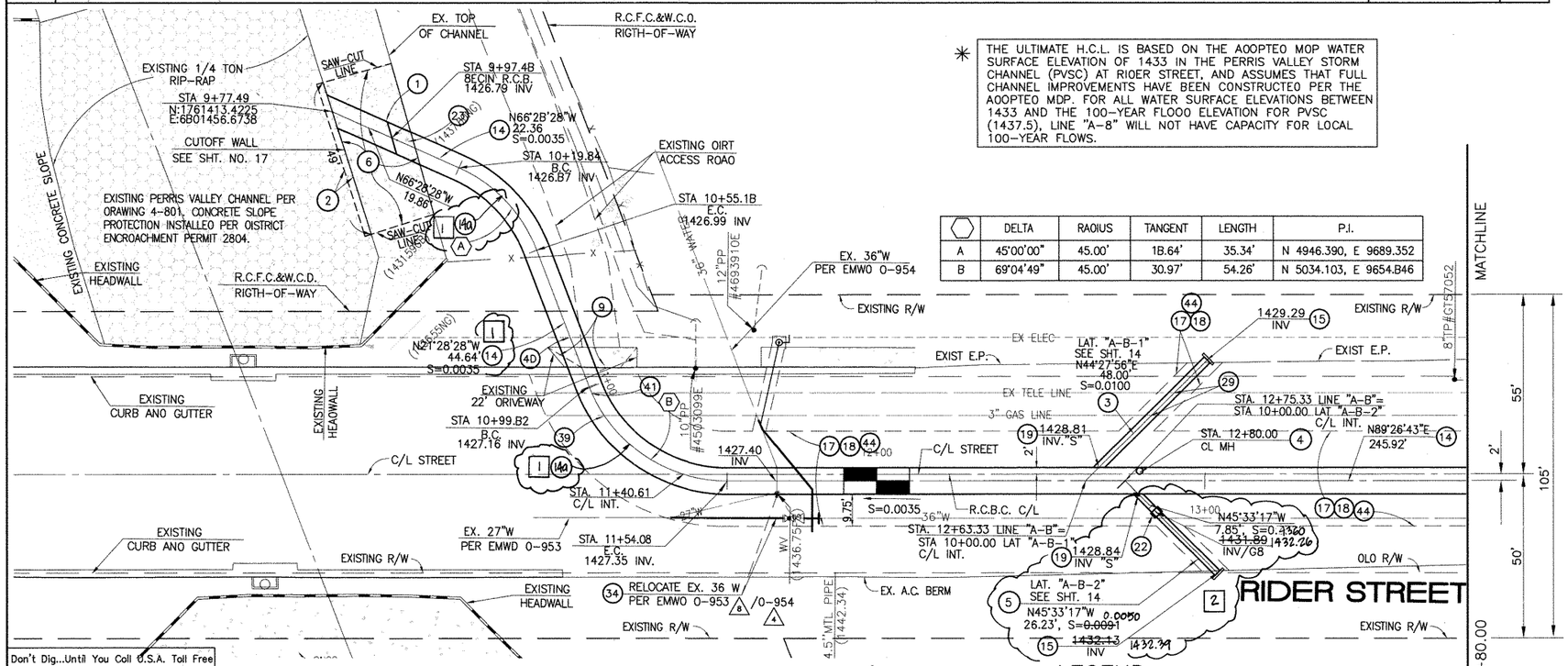


SECTION AT STA. 12+00.00

FROM STA 11+54.08 TO STA 12+11.85

0 5 10 20

SCALE:1"=10'



	DELTA	RADIUS	TANGENT	LENGTH	P.I.
A	45°00'00"	45.00'	18.64'	35.34'	N 4946.390, E 9689.352
B	69°04'49"	45.00'	30.97'	54.26'	N 5034.103, E 9654.846

* THE ULTIMATE H.C.L. IS BASED ON THE ADOPTED MDP WATER SURFACE ELEVATION OF 1433 IN THE PERRIS VALLEY STORM CHANNEL (PVSC) AT RIDER STREET, AND ASSUMES THAT FULL CHANNEL IMPROVEMENTS HAVE BEEN CONSTRUCTED PER THE ADOPTED MDP. FOR ALL WATER SURFACE ELEVATIONS BETWEEN 1433 AND THE 100-YEAR FLOOD ELEVATION FOR PVSC (1437.5), LINE "A-B" WILL NOT HAVE CAPACITY FOR LOCAL 100-YEAR FLOWS.

LEGEND:

1 — REVISION SYMBOL AND NUMBER PER EMWD REQUIREMENT (TYPICAL TO ALL SHEETS)

STORM DRAIN CONSTRUCTION NOTES:

1. DAYLIGHT R.C.B. ROOF PARALLEL TO TOP OF SLOPE. TAPER OOWN R.C.B. SIDEWALLS WITH SLOPE FACE. SEE DETAILS ON SHT. NO. 1B.
2. REMOVE AND REPLACE APPROXIMATELY 2' WIDE 1/4 TON GROUTED RIPRAP, MATCH EXISTING THICKNESS.
3. CONSTRUCT 30" R.C.P, D-LOAD PER PLAN.
4. CONSTRUCT MANHOLE NO. 3 PER R.C.F.C.&W.C.D. STD OWG. MH253
5. CONSTRUCT 24" R.C.P, D-LOAD PER PLAN.
6. SAWCUT AND REMOVE EXISTING CONCRETE SIDESLOPE. SALVAGE 30" MINIMUM LONGITUDINAL AND/OR TRANSVERSE REBAR FROM EXISTING SLOPE PROTECTION AT ALL SAWCUT LOCATIONS. SPLICE SALVAGED REBAR TO NEW CONCRETE REINFORCING PER CURRENT ACI CODE. REPLACEMENT CONCRETE TO MATCH EXISTING THICKNESS, OR MINIMUM 6" THICK, WHICHEVER IS GREATER WITH #4 BARS @ 18" ON CENTER EACH WAY.
9. REMOVE AND REPLACE APPROACH EXISTING DRIVEWAY (SEE SHEET NO. 1B).
1 14. CONSTRUCT 8' X 7' RCB PER CALTRANS STD PLAN NO. 0B0. ON 45' RADIUS CURVED SECTIONS, INSIDE WALL (41' RADIUS) MUST BE SMOOTH CURVED AND OUSIDE WALL (49' RADIUS) MUST HAVE MAXIMUM WALL CHORD LENGTH OF 8.0'
15. CONSTRUCT CONCRETE BULKHEAD PER R.C.F.C.&W.C.D. STD. OWG. MB16
17. SAWCUT AND REMOVE EXISTING A.C. PAVEMENT.
18. UTILITY TRENCH AND SURFACE REPAIR PER CITY STANDARD ON SHT. NO. 1B, MODIFIED TO ACCOMMODATE SLURRY BACKFILL WHERE BOX COVER IS LESS THAN 2.0'.
19. CONSTRUCT JUNCTION STRUCTURE NO. 3 PER R.C.F.C.&W.C.D. STD. OWG. JS228.
22. CONSTRUCT CONCRETE COLLAR PER R.C.F.C.&W.C.D. STD OWG. MB03.
23. CONSTRUCT SLOPED PROTECTION BARRIER PER A.P.W.A. STD. PLAN NO. 360-0.
29. PROTECT IN PLACE EXISTING UTILITY
34. RELOCATE EXISTING WATER LINE PER E.M.W.D. PLANS.
39. RELOCATE EXISTING GAS LINE.
40. RELOCATE EXISTING ELECTRICAL LINE.
41. RELOCATE EXISTING TELEPHONE LINE.
44. SAWCUT, REMOVE AND REPLACE A.C. PAVEMENT SURFACE REPAIR PER CITY STD. ON SHEET 1B. SEE SEPARTE PAVING PLAN.
1 14. CONSTRUCT 8'X7' PRE-CAST RCB PER APWA STD PLAN 390-0 SEE JOINT SEALANT NOTE ON SHT. 1

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BENCH MARK

COUNTY OF RIVERSIDE BENCHMARK NO. 24-31

COUNTY OF RIVERSIDE BENCHMARK - 3 1/4" ALUMINUM DISK MARKED 4-31, LOCATED FLUSH AT THE SOUTH WEST CORNER OF BRIDGE ON TOP OF SIDEWALK NEAR FACE OF CURB LOCATED AT THE CROSSING OF PERRIS BLVD. AND RIV. CO. FLOOD CONTROL CHANNEL (PERRIS LATERAL "A"), 43 FT. WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE BARRIER. (EDGE OF BRIDGE) MARKED R-102 D.M.R. IN TOP OF CONC. POST FLUSH W/ GROUND

ELEVATION = 1474.674' (NAVD 1929)

REF.	REVISIONS	ENGINEER APPR.	ENGINEER DATE	RCFC/ APPR.	RCFC/ DATE
2	CHANGED SLOPE TO D-0013, ADDED MH; ADDED NEW D"S, CHANGED 82" LAT TO 24" LAT, ADDED EX. UTILITIES, RELOCATE UTILITIES, REVISED QS.	H.I.A.	2/3/16	[illegible]	2/23/16
1	CHANGED C.I.P. RCB TO PRE-CAST RCB PER APWA 390-0	H.I.A.	2/3/16	[illegible]	2/27/16

DESIGNED BY: BW
DRAWN BY: ET
DATE DRAWN:

APPROVED BY: Thienes Engineering, Inc. CIVIL ENGINEERING • LAND SURVEYING 14349 FIRESTONE BOULEVARD LA MIRADA, CALIFORNIA 90638 PH.(714)521-4811 FAX(714)521-4173

Haidaek Aghaian Date: 11/18/14

HAIDOOK I. AGHAIAN RCE NO. 43293

REGISTERED PROFESSIONAL ENGINEER HAIDOOK I. AGHAIAN R.C.E. NO. 43293 Exp. 3-31-16 CIVIL STATE OF CALIFORNIA

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

RECOMMENDED FOR APPROVAL BY: [signature] DATE: 1/20/2015

APPROVED BY: Mark H. Wills DATE: 1/20/2015

CITY OF PERRIS APPROVED BY:

CITY ENGINEER [signature] DATE: 12-15-14

RECOMMENDED DATE:

PERRIS VALLEY MDP LINE "A-B"

FROM STA. 9+97.48 TO STA. 13+80

CITY OF PERRIS FILE NO. P8-1013

PROJECT NO. 4-0-00537

DRAWING NO. 4-1063

SHEET NO. 2 OF 18

Last Update: 11/18/14
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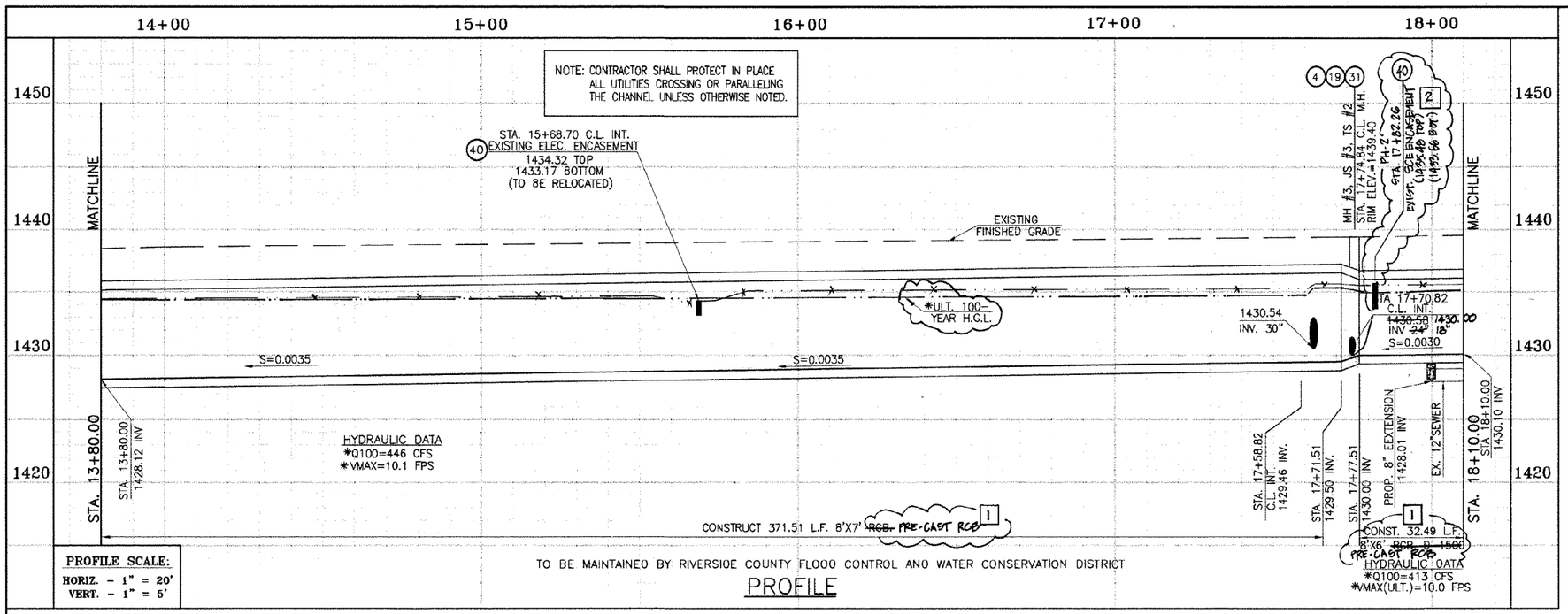
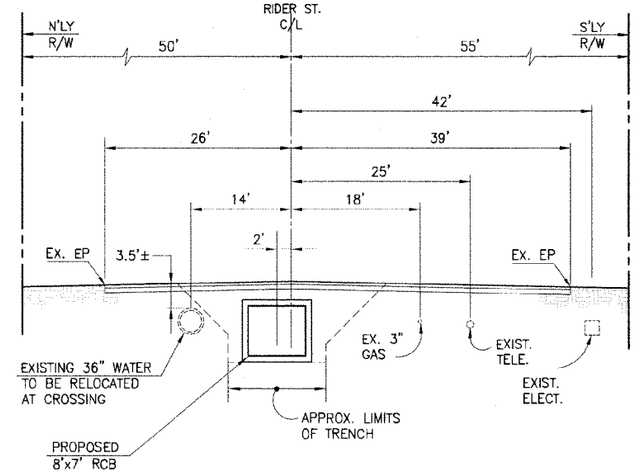


PROFILE

PROFILE SCALE:
HORIZ. - 1" = 20'
VERT. - 1" = 5'



SECTION AT STA. 16+50.00

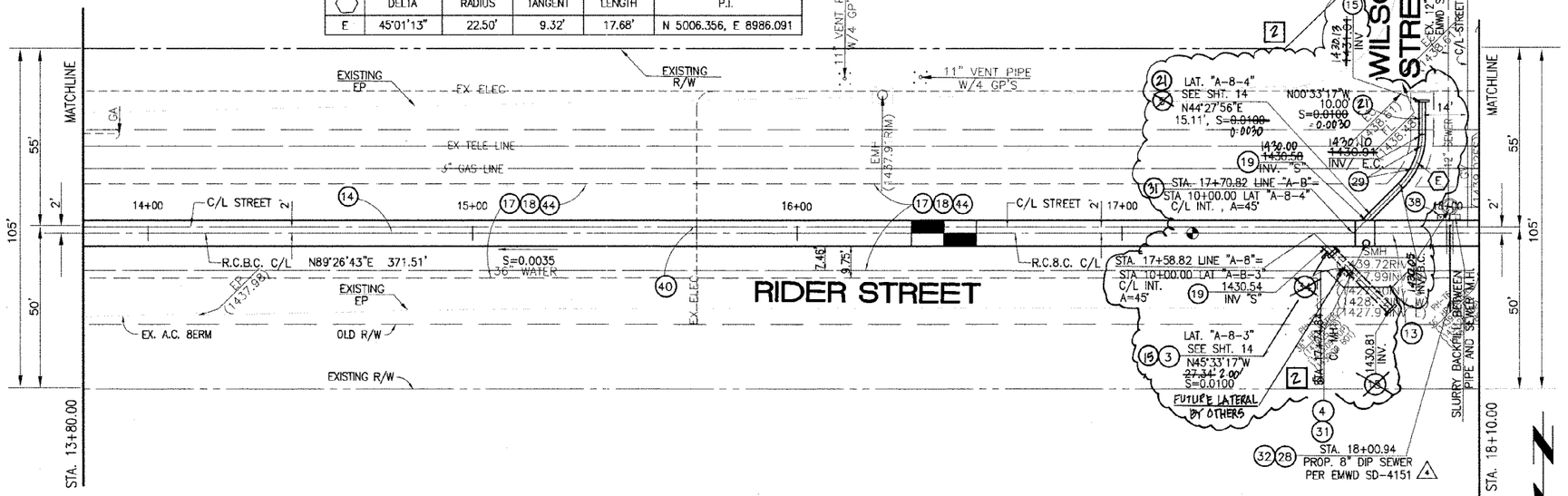
STA 14+15.65 TO STA 17+49.84

0 5 10 20
SCALE:1"=10'

✳ THE ULTIMATE H.G.L. IS BASED ON THE ADOPTED MDP WATER SURFACE ELEVATION OF 1433 IN THE PERRIS VALLEY STORM CHANNEL (PVSC) AT RIDER STREET, AND ASSUMES THAT FULL CHANNEL IMPROVEMENTS HAVE BEEN CONSTRUCTED PER THE ADOPTED MDP. FOR ALL WATER SURFACE ELEVATIONS BETWEEN 1433 AND THE 100-YEAR FLOOD ELEVATION FOR PVSC (1437.5), LINE "A-B" WILL NOT HAVE CAPACITY FOR LOCAL 100-YEAR FLOWS.

CAUTION:
PROPOSED WORK IS IN PROXIMITY OF HIGH PRESSURE GAS LINES

	DELTA	RADIUS	TANGENT	LENGTH	P.I.
E	45°01'13"	22.50'	9.32'	17.68'	N 5006.356, E 8986.091



0 10 20 40
SCALE:1"=20'

STORM DRAIN CONSTRUCTION NOTES:

(3) CONSTRUCT 30" R.C.P, D-LOAD PER PLAN.
(4) CONSTRUCT MANHOLE NO. 3 PER R.C.F.C.&W.C.D. STD DWG. MH253
(5) CONSTRUCT 24" R.C.P, D-LOAD PER PLAN.
(1)(13) CONSTRUCT 8' X 6' ~~RCB PER CALTRANS STD PLAN NO. D80 OR APPROVED EQUAL~~ PRE CAST RCB APWA STD PLAN 380-0 OR APPROVED EQUAL SEE JOINT SEALANT NOTE ON SHT. 1.
(1)(14) CONSTRUCT 8' X 7' ~~RCB PER CALTRANS STD PLAN NO. D80 OR APPROVED EQUAL~~ PRE-CAST RCB APWA STD PLAN 380-0 OR APPROVED EQUAL. ~~SEE JOINT SEALANT NOTE ON SHT. 1.~~
(15) CONSTRUCT CONCRETE BULKHEAD PER R.C.F.C.&W.C.D. STD DWG. M816.
(17) SAWCUT AND REMOVE EXISTING A.C. PAVEMENT.
(18) UTILITY TRENCH AND SURFACE REPAIR PER CITY STANDARD ON SHT. NO. 18, MODIFIED TO ACCOMMODATE SLURRY BACKFILL WHERE BOX COVER IS LESS THAN 2.0'.
(19) CONSTRUCT JUNCTION STRUCTURE NO. 3 PER R.C.F.C.&W.C.D. STD. DWG. JS228.
(28) CONSTRUCT SEWER PROTECTION PER R.C.F.C.&W.C.D. STD. DWG. M807.
(29) PROTECT IN PLACE EXISTING UTILITIES.
(31) CONSTRUCT MODIFIED TRANSITION STRUCTURE NO.2 PER R.C.F.C.&W.C.D. STD. DWG. TS302.
(32) INSTALL 8" DIP SEWER, ENCASED WITH 2500 PSI CONCRETE PER CALTRANS STD PLAN NO. 080.
(34) RELOCATE EXISTING WATER LINE PER EMWD PLANS (36" WATER LINE).
(38) SLURRY BACKFILL BETWEEN RCB AND MANHOLE.
(40) RELOCATE EXISTING ELECTRICAL LINE.
(2)(44) SAWCUT, REMOVE AND REPLACE A.C. PAVEMENT SURFACE REPAIR PER CITY STD. ON SHEET 18.
(2)(21) CONSTRUCT 18" R.C.P., D-LOAD PER PLAN.

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BENCH MARK
COUNTY OF RIVERSIDE BENCHMARK NO. "M-31"
COUNTY OF RIVERSIDE BENCHMARK - 3 1/4" ALUMINUM DISK MARKED M-31, LOCATED FLUSH AT THE SOUTH WEST CORNER OF BRIDGE ON TOP OF SIDEWALK NEAR FACE OF CURB LOCATED AT THE CROSSING OF PERRIS BLVD. AND RIV. CO. FLOOD CONTROL CHANNEL (PERRIS LATERAL 2-7) 43 FT. WEST OF CENTERLINE OF PERRIS BLVD. AND 4.2 FT. EAST OF CONCRETE BRIDGE BARRIER. (EDGE OF BRIDGE) MARKED R-102 L.W.R. IN TOP OF CONC. POST FLUSH W/ GROUND
ELEVATION = 1474.874' (NAVD 1929)

REF.	REVISIONS	ENGINEER APPR.	ENGINEER DATE	RCFC/ APPR.	RCFC/ DATE
2	CHANGED SLOPE TO 0.0035, ADDED MH, ADDED NEW D/S, CHANGED 42"LAT TO 24"LAT, ADDED BY.				
1	UTILITIES, RELOCATE UTILITIES, REVISED S.D.	H.NA	2/3/16	DG	2/23/16
	CHANGED C.I.P. RCB TO PRE-CAST RCB APWA 380-0	H.I.A	2/3/16	DG	2/23/16

DESIGNED BY: BW
DRAWN BY: ET
DATE DRAWN:

APPROVED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173
Haidook I. Aghaian Date: 11/18/14
HAIDOOK I. AGHAIAN RCE NO. 43293

REGISTERED PROFESSIONAL ENGINEER HAIDOOK I. AGHAIAN R.C.E. NO. 43293 Exp. 3-31-16 CIVIL STATE OF CALIFORNIA

RKH 4/10/14

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 1/20/2015
APPROVED BY: Mark H. Wills DATE: 1/20/2015

CITY OF PERRIS
APPROVED BY:
CITY ENGINEER DATE: 12-15-14
RECOMMENDED DATE:

CITY OF PERRIS
FILE NO. P8-1013

PERRIS VALLEY MDP
LINE "A-B"
FROM STA. 13+80 TO STA. 18+10

PROJECT NO. 4-0-00537
DRAWING NO. 4-1063
SHEET NO. 3 OF 18

Last Update: 11/18/14
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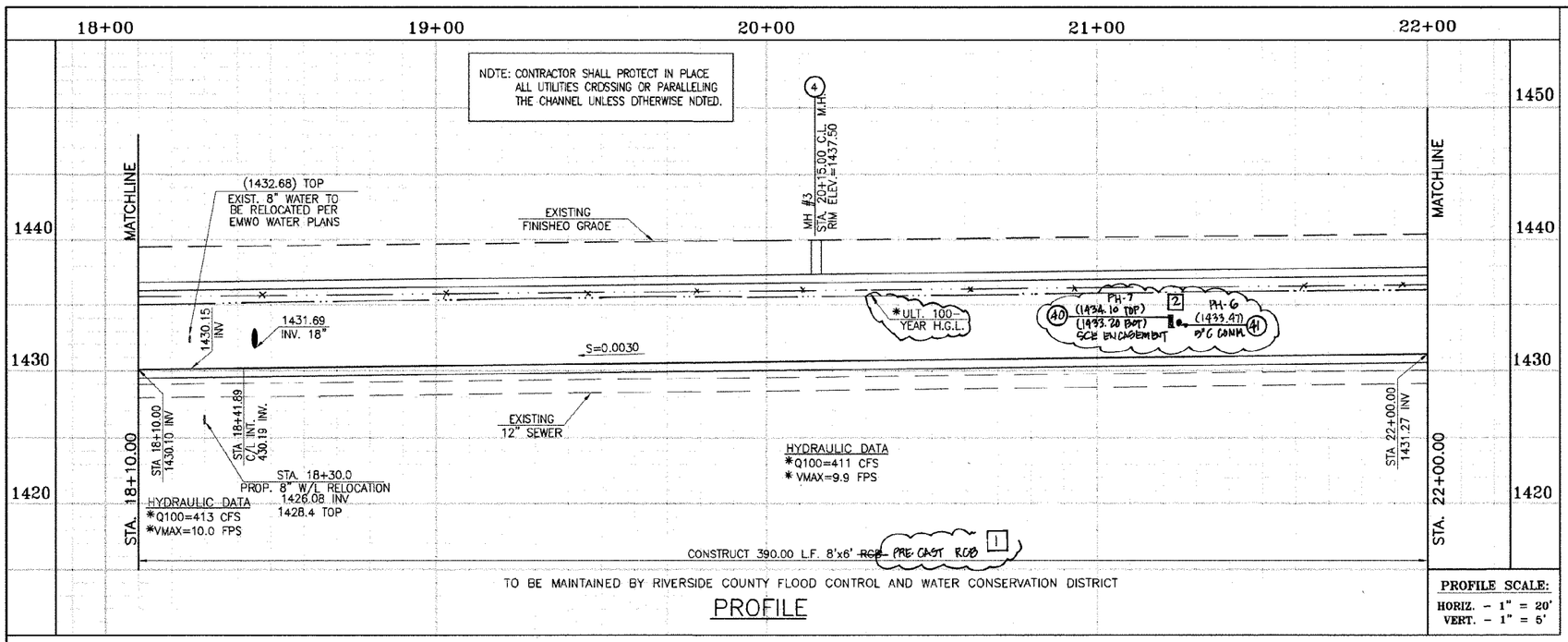
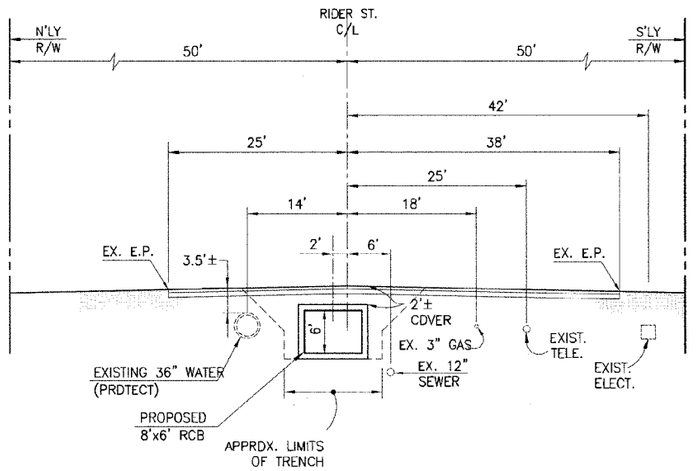


PROFILE

PROFILE SCALE:
HORIZ. - 1" = 20'
VERT. - 1" = 5'

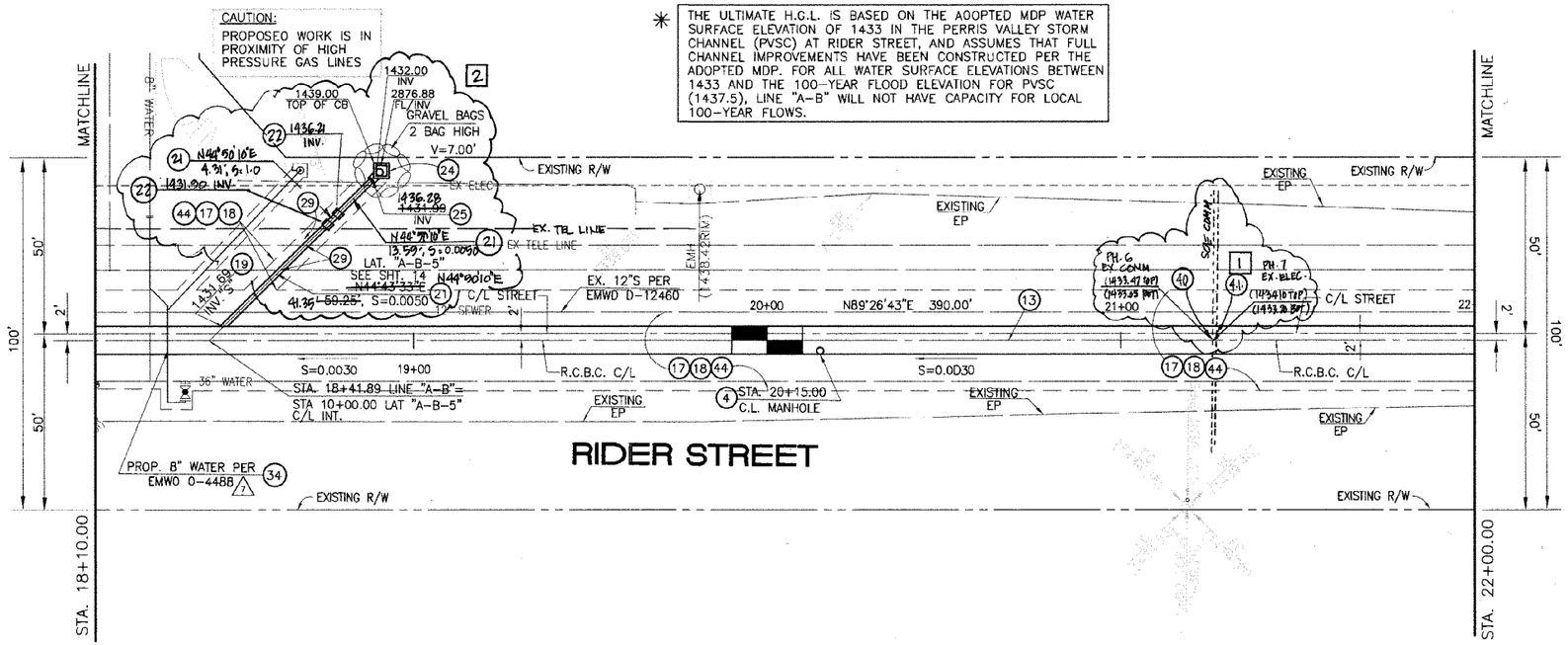


SECTION AT STA. 20+00.00
FROM STA 18+63.90 TO STA 22+00

0 5 10 20
SCALE:1"=10'

CAUTION:
PROPOSED WORK IS IN PROXIMITY OF HIGH PRESSURE GAS LINES

* THE ULTIMATE H.G.L. IS BASED ON THE ADOPTED MDP WATER SURFACE ELEVATION OF 1433 IN THE PERRIS VALLEY STORM CHANNEL (PVSC) AT RIDER STREET, AND ASSUMES THAT FULL CHANNEL IMPROVEMENTS HAVE BEEN CONSTRUCTED PER THE ADOPTED MDP. FOR ALL WATER SURFACE ELEVATIONS BETWEEN 1433 AND THE 100-YEAR FLOOD ELEVATION FOR PVSC (1437.5), LINE "A-B" WILL NOT HAVE CAPACITY FOR LOCAL 100-YEAR FLOWS.



PLAN

0 10 20 40
SCALE:1"=20'

STORM DRAIN CONSTRUCTION NOTES:

(4) CONSTRUCT MANHOLE NO. 3 PER R.C.F.C.&W.C.O. STD OWG. MH253
[1] (13) CONSTRUCT 8' X 6' ~~RCB PER CALTRANS STD PLAN NO. D80 OR APPROVED EQUAL.~~ PRE-CAST RCB APWA STD PLAN 380-0 OR APPROVED EQUAL. ~~SEE JOINT SEALANT NOTE ON SHT. 1.~~
(17) SAWCUT AND REMOVE EXISTING A.C. PAVEMENT.
(18) UTILITY TRENCH AND SURFACE REPAIR PER CITY STANDARD ON SHT. NO. 18, MODIFIED TO ACCOMMODATE SLURRY BACKFILL WHERE BOX COVER IS LESS THAN 2.0'.
(19) CONSTRUCT JUNCTION STRUCTURE NO. 3 PER R.C.F.C.&W.C.O. STD. OWG. JS228.
(21) CONSTRUCT 18" R.C.P, O-LOAD PER SHEET #14.
(24) CONSTRUCT CONCRETE ORDP INLET PER R.C.F.C.&W.C.O. STD DWG. CB110
(25) CONSTRUCT SPECIAL CONNECTION PER R.C.F.C.&W.C.O. STD OWG. CB109
(29) PROTECT IN PLACE EXISTING UTILITIES.
(34) RELOCATE EXISTING WATER LINE PER E.M.W.D. PLANS.
(44) SAWCUT, REMOVE AND REPLACE A.C. PAVEMENT SURFACE REPAIR PER CITY STD. ON SHEET 18. SEE SEPARATE PAVING PLANS.
[2] (22) CONSTRUCT CONCRETE COLLAR PER R.C.F.C.&W.C.D. STD DWG M803.
(40) RELOCATE EXISTING ELECTRICAL LINE.
(41) RELOCATE EXISTING TELEPHONE LINE.

BENCH MARK
COUNTY OF RIVERSIDE BENCHMARK NO. "M-31"
COUNTY OF RIVERSIDE BENCHMARK - 3 1/4" ALUMINUM DISK MARKED M-31, LOCATED 11.50M AT THE SOUTH WEST CORNER OF BRIDGE ON TOP OF SIDEWALK NEAR FACE OF CURB LOCATED AT THE CROSSING OF PERRIS BLVD. AND RIV. CO. FLOOD CONTROL CHANNEL (PERRIS LATERAL 3-7, 43 FT. WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE BARRIER. (EDGE OF BRIDGE) MARKED R-102 D.M.R. IN TOP OF CONC. POST FLUSH W/ GROUND
ELEVATION = 1474.674' (NAVD 1929)

REF	REVISIONS	ENGINEER APPR.	ENGINEER DATE	RCFC/ APPR.	RCFC/ DATE
[2]	CHANGED SLOPE TO 0.0030, ADDED MH, MODED NEW 10^0.5, CHANGED 42° LAT TO 22° LAT. MODED				
[1]	EX UTILITIES, RELOCATE UTILITIES, REV. S.D. CHANGED C.I.P RCB TO PRE-CAST RCB APWA 380-0	H.A. H.A.	2/9/16 2/3/16	2/3/16 2/3/16	2/3/16 2/3/16

DESIGNED BY: BW
DRAWN BY: ET
DATE DRAWN:

APPROVED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173
Haidook Aghaian Date: 11/18/14
HAIDOOK I. AGHAIAN RCE NO. 43293

REGISTERED PROFESSIONAL ENGINEER HAIDOOK I. AGHAIAN R.C.E. NO. 43293 Exp. 3-31-16 CIVIL STATE OF CALIFORNIA

RFH 4/10/14

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 1/26/2015
APPROVED BY: DATE: 1/20/2015

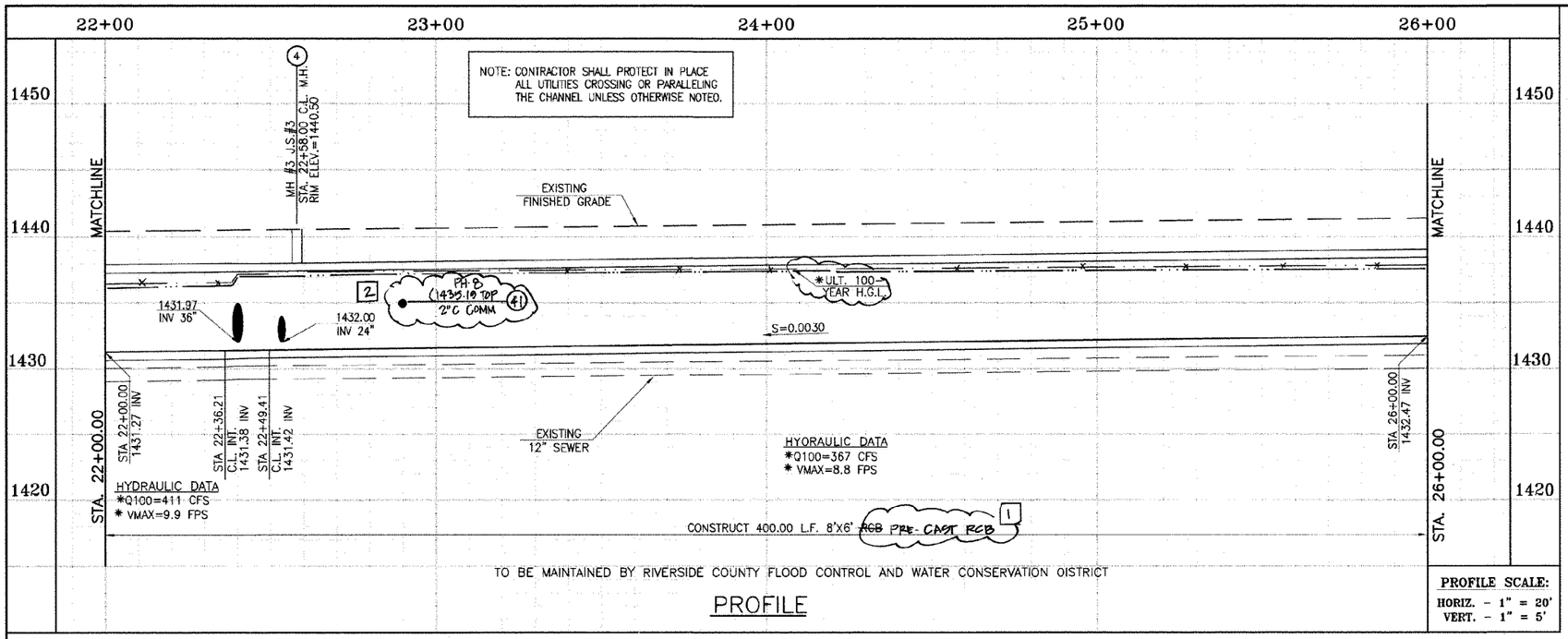
CITY OF PERRIS
APPROVED BY: CITY ENGINEER DATE: 12-15-14
RECOMMENDED DATE:

PERRIS VALLEY MDP LINE "A-B"

FROM STA. 18+10 TO STA. 22+00

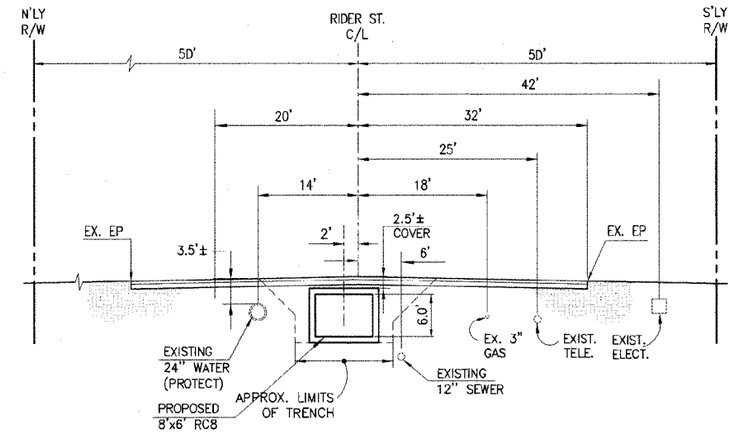
CITY OF PERRIS FILE NO. P8-1013
PROJECT NO. 4-0-00537
DRAWING NO. 4-1063
SHEET NO. 4 OF 18

Last Update: 11/18/14
O:\2700-2799\2702\2702P\2702SD04.dwg



PROFILE

PROFILE SCALE:
HORIZ. - 1" = 20'
VERT. - 1" = 5'



SECTION AT STA. 24+00.00

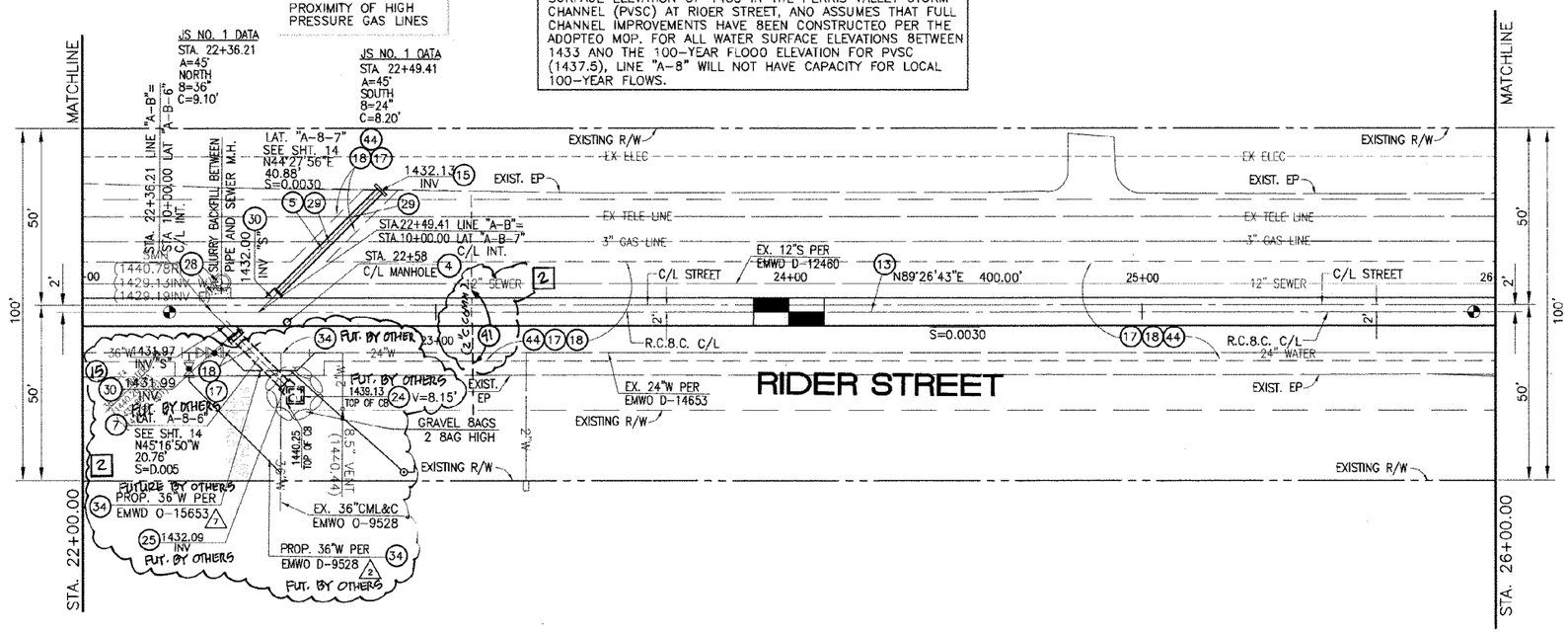
FROM STA 22+00 TO STA 26+00

0 5 10 20

SCALE:1"=10'

CAUTION:
PROPOSED WORK IS IN PROXIMITY OF HIGH PRESSURE GAS LINES

* THE ULTIMATE H.G.L. IS BASED ON THE ADOPTED MDP WATER SURFACE ELEVATION OF 1433 IN THE PERRIS VALLEY STORM CHANNEL (PVSC) AT RIDER STREET, AND ASSUMES THAT FULL CHANNEL IMPROVEMENTS HAVE BEEN CONSTRUCTED PER THE ADOPTED MDP. FOR ALL WATER SURFACE ELEVATIONS BETWEEN 1433 AND THE 100-YEAR FLOOD ELEVATION FOR PVSC (1437.5), LINE "A-8" WILL NOT HAVE CAPACITY FOR LOCAL 100-YEAR FLOWS.



PLAN

0 10 20 40

SCALE:1"=20'

STORM DRAIN CONSTRUCTION NOTES:

(4) CONSTRUCT MANHOLE NO. 3 PER R.C.F.C.&W.C.D. STD OWG. MH253
(5) CONSTRUCT 24" R.C.P, O-LOAD PER PLAN.
(7) CONSTRUCT 36" R.C.P. O-LOAD PER PLAN.
[1] (13) CONSTRUCT 8' x 6' ~~RCB PER CALTRANS STD PLAN NO. D86 OR APPROVED EQUAL.~~ PRE-CAST RCB PER AFWA STD PLAN 390-0 OR APPROVED EQUAL. SEE JOINT SEALANT NOTE ON SHT. 1.
(15) CONSTRUCT CONCRETE BULKHEAD PER R.C.F.C.&W.C.D. STD OWG. M816.
(17) SAWCUT AND REMOVE EXISTING A.C. PAVEMENT.
(18) UTILITY TRENCH AND SURFACE REPAIR PER CITY STANDARD ON SHT. NO. 18, MODIFIED TO ACCOMMODATE SLURRY BACKFILL WHERE BOX COVER IS LESS THAN 2.0'.
(24) CONSTRUCT CONCRETE DROP INLET PER R.C.F.C.&W.C.D. STD OWG. C8110 W=3.50'
(25) CONSTRUCT SPECIAL CONNECTION PER R.C.F.C.&W.C.D. STD OWG. C8109
(28) CONSTRUCT SEWER PROTECTION PER R.C.F.C.&W.C.D. STD. DWG. M807. OR CONCRETE ENCASEMENT NO. 2 PER EMWD STD. NO. S8-157.
(29) PROTECT IN PLACE EXISTING UTILITIES.
(30) CONSTRUCT JUNCTION STRUCTURE NO.1 PER R.C.F.C.&W.C.D. STD. OWG. JS226.
(34) RELOCATE EXISTING WATER LINE PER E.M.W.D. PLANS.
(44) SAWCUT, REMOVE AND REPLACE A.C. PAVEMENT SURFACE REPAIR PER CITY STD. ON SHEET 18. SEE SEPARATE PAVING PLANS.
[2] (41) ~~RELOCATE EXISTING TELEPHONE LINE.~~

Don't Dig...Until You Call U.S.A. Toll Free 1-800-227-2600 for the location of buried utility lines. Don't disrupt vital services.
TWO WORKING DAYS BEFORE YOU DIG

BENCH MARK
COUNTY OF RIVERSIDE BENCHMARK NO. "M-31"
COUNTY OF RIVERSIDE BENCHMARK - 3 1/4" ALUMINUM DISK MARKED M-31, LOCATED FLUSH AT THE SOUTH WEST CORNER OF BRIDGE ON TOP OF SIDEWALK NEAR FACE OF CURB LOCATED AT THE CROSSING OF PERRIS BLVD. AND RW. CO. FLOOD CONTROL CHANNEL (PERRIS LATERAL 2-7, 43 FT. WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE BARRIER. (EDGE OF BRIDGE) MARKED M-1103 U.M.K. IN TOP OF CONC. POST FLUSH W/ GROUND
ELEVATION = 1474.674' (NAVD 1929)

KEY	REVISIONS	ENGINEER APPR.	ENGINEER DATE	RCFC/ APPR.	RCFC/ DATE
[2]	CHANGED SLOPE TO 0.0015, NOTED MH, ADDED NEW 10"S CHANGED 42" LAT TO 24" LAT, ADDED EX. UTILITIES, RELOCATE UTILITIES, REV. S.D.	H.L.A.	2/3/16	DB	2/3/16
[1]	CHANGED C.I.P. RCB TO PRE-CAST RCB AFWA 390-0	H.L.A.	2/3/16	DB	2/3/16

DESIGNED BY: BW
DRAWN BY: ET
DATE DRAWN:

APPROVED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173
Haidook Aghaian Date: 11/18/14
HAIDOOK I. AGHAIAN RCE NO. 43293

REGISTERED PROFESSIONAL ENGINEER HAIDOOK I. AGHAIAN R.C.E. NO. 43293 Exp. 3-31-16 CIVIL STATE OF CALIFORNIA

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 1/29/2015
APPROVED BY: Mark A. Wills DATE: 1/20/2015

CITY OF PERRIS APPROVED BY:
CITY ENGINEER DATE: 12-18-14
RECOMMENDED DATE:

CITY OF PERRIS
FILE NO. P8-1013

PERRIS VALLEY MDP LINE "A-B"

FROM STA. 22+00 TO STA. 26+00

PROJECT NO. 4-0-00537
DRAWING NO. 4-1063
SHEET NO. 5 OF 18

RAL 4/9/14

Last Update: 11/18/14
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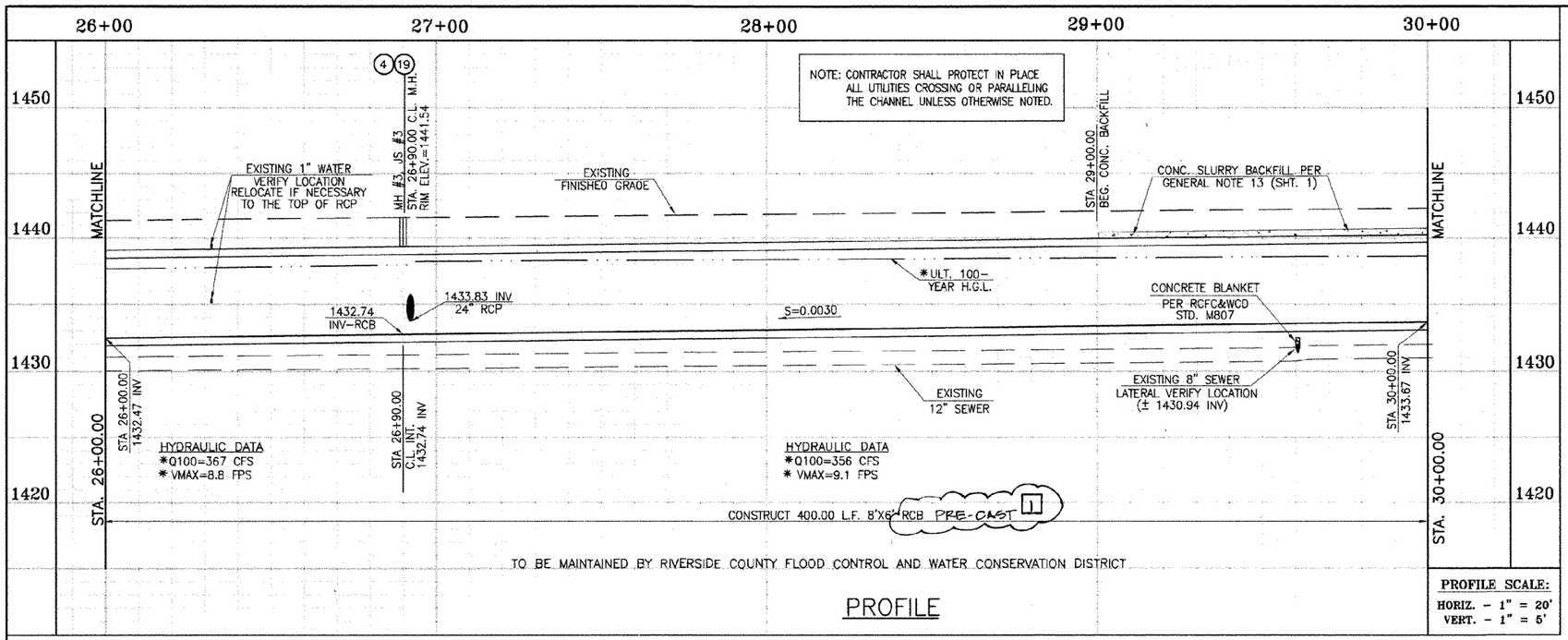
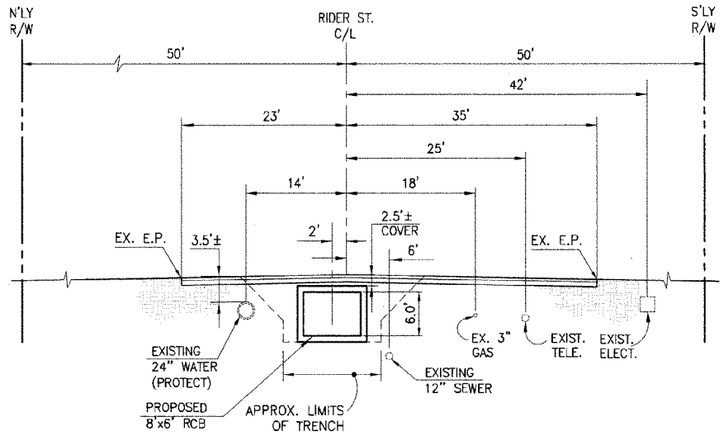


PROFILE

PROFILE SCALE:
HORIZ. - 1" = 20'
VERT. - 1" = 5'

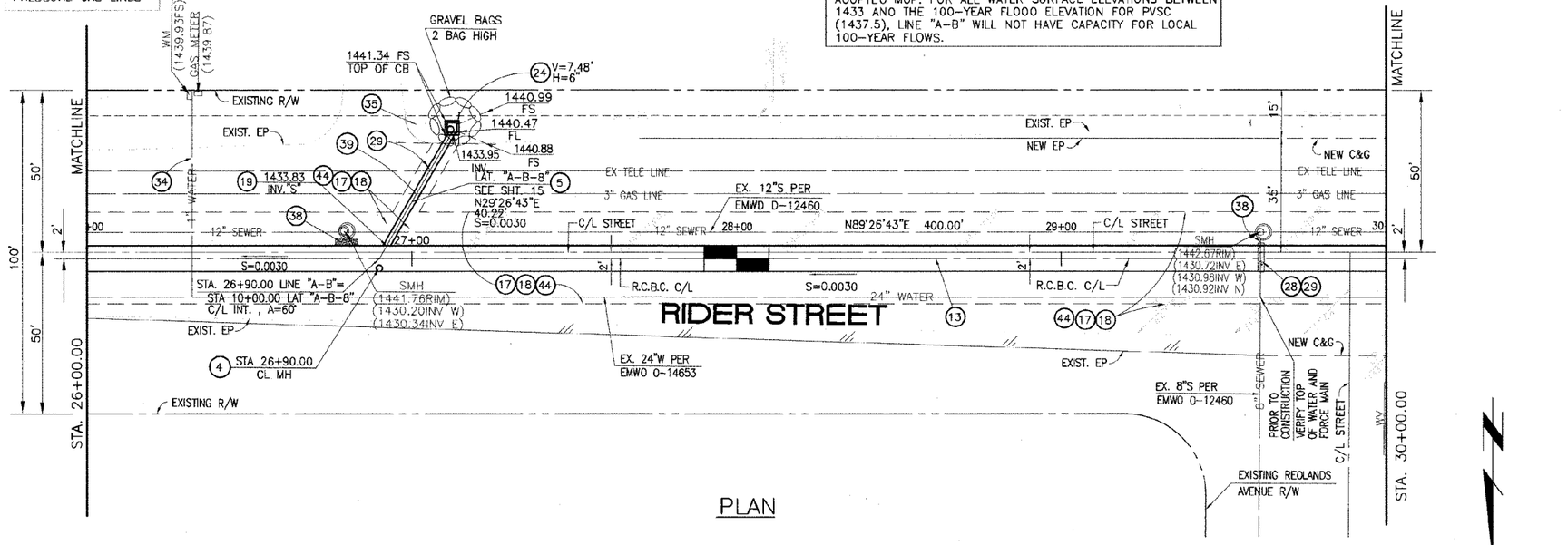


SECTION AT STA. 28+00.00
FROM STA 26+00 TO STA 29+62.72

0 5 10 20
SCALE:1"=10'

CAUTION:
PROPOSED WORK IS IN PROXIMITY OF HIGH PRESSURE GAS LINES

* THE ULTIMATE H.G.L. IS BASED ON THE ADOPTED MDP WATER SURFACE ELEVATION OF 1433 IN THE PERRIS VALLEY STORM CHANNEL (PVSC) AT RIDER STREET, AND ASSUMES THAT FULL CHANNEL IMPROVEMENTS HAVE BEEN CONSTRUCTED PER THE ADOPTED MDP. FOR ALL WATER SURFACE ELEVATIONS BETWEEN 1433 AND THE 100-YEAR FLOOD ELEVATION FOR PVSC (1437.5), LINE "A-B" WILL NOT HAVE CAPACITY FOR LOCAL 100-YEAR FLOWS.



PLAN

0 10 20 40
SCALE:1"=20'

STORM DRAIN CONSTRUCTION NOTES:

(4) CONSTRUCT MANHOLE NO. 3 PER R.C.F.C.&W.C.D. STD DWG. MH253
(5) CONSTRUCT 24" R.C.P. 0-LOAD PER PLAN.
[1] (13) CONSTRUCT 8' X 6' ~~RCB PER CALTRANS STD PLAN NO. D86 OR APPROVED EQUAL~~ PRE-CAST RCB APWA STD PLAN 380-0 OR APPROVED EQUAL SEE JOINT SEALANT NOTE ON SHT. 1
(17) SAWCUT AND REMOVE EXISTING A.C. PAVEMENT.
(18) UTILITY TRENCH AND SURFACE REPAIR PER CITY STANDARD ON SHT. NO. 18, MODIFIED TO ACCOMMODATE SLURRY BACKFILL WHERE BOX COVER IS LESS THAN 2.0'.
(19) CONSTRUCT JUNCTION STRUCTURE NO.3 PER R.C.F.C.&W.C.D. STD. DWG. JS228.
(24) CONSTRUCT CONCRETE DROP INLET PER R.C.F.C.&W.C.D. STD DWG. CB110
(28) CONSTRUCT SEWER PROTECTION PER R.C.F.C.&W.C.D. STD. DWG. M807.
(29) PROTECT IN PLACE EXISTING UTILITIES.
(34) RELOCATE EXISTING WATER LINE PER E.M.W.D. PLANS.
(35) CONSTRUCT 4" THICK AC PAVEMENT OVER NATIVE.
(38) SLURRY BACKFILL BETWEEN RCB AND MANHOLE.
(39) RELOCATE EXISTING GAS LINE.
(44) SAWCUT, REMOVE AND REPLACE A.C. PAVEMENT SURFACE REPAIR PER CITY STD. ON SHEET 18. SEE SEPARATE PAVING PLANS.

BENCH MARK
COUNTY OF RIVERSIDE BENCHMARK NO. "A-31"
COUNTY OF RIVERSIDE BENCHMARK - 3 1/4" ALUMINUM DISK MARKED "A-31", LOCATED 41.0M AT THE SOUTH WEST CORNER OF BRIDGE ON TOP OF SIDEWALK NEAR FACE OF CURB LOCATED AT THE CROSSING OF PERRIS BLVD. AND RIV. CO. FLOOD CONTROL CHANNEL (PERRIS LATERAL 7), 43 FT. WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE BARRIER. (EDGE OF BRIDGE) MARKED A-103 D.M.S. IN TOP OF CONC. POST FLUSH W/ GROUND
ELEVATION = 1474.674' (NAVD 1929)

REF.	REVISIONS	ENGINEER APPR.	ENGINEER DATE	RCFC/ APPR.	RCFC/ DATE
1	CHANGED CAP. RCB TO PRE CAST RCB APWA 380-0	H.I.A.		JG	3/23/16

DESIGNED BY: BW
DRAWN BY: ET
DATE DRAWN:

KRH 4/10/14

APPROVED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173
Haidook Aghaian Date: 11/18/14
HAIDOOK I. AGHAIAN RCE NO. 43293

REGISTERED PROFESSIONAL ENGINEER HAIDOOK I. AGHAIAN R.C.E. NO. 43293 Exp. 3-31-16 CIVIL STATE OF CALIFORNIA

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 1/20/2015
APPROVED BY: Mark M. Wills DATE: 1/20/2015

CITY OF PERRIS
APPROVED BY:
CITY ENGINEER DATE: 12-15-14
RECOMMENDED DATE:

CITY OF PERRIS
FILE NO. P8-1013

PERRIS VALLEY MDP
LINE "A-B"
FROM STA. 26+00 TO STA. 30+00

PROJECT NO. 4-0-00537
DRAWING NO. 4-1063
SHEET NO. 6 OF 18

Last Update: 11/18/14
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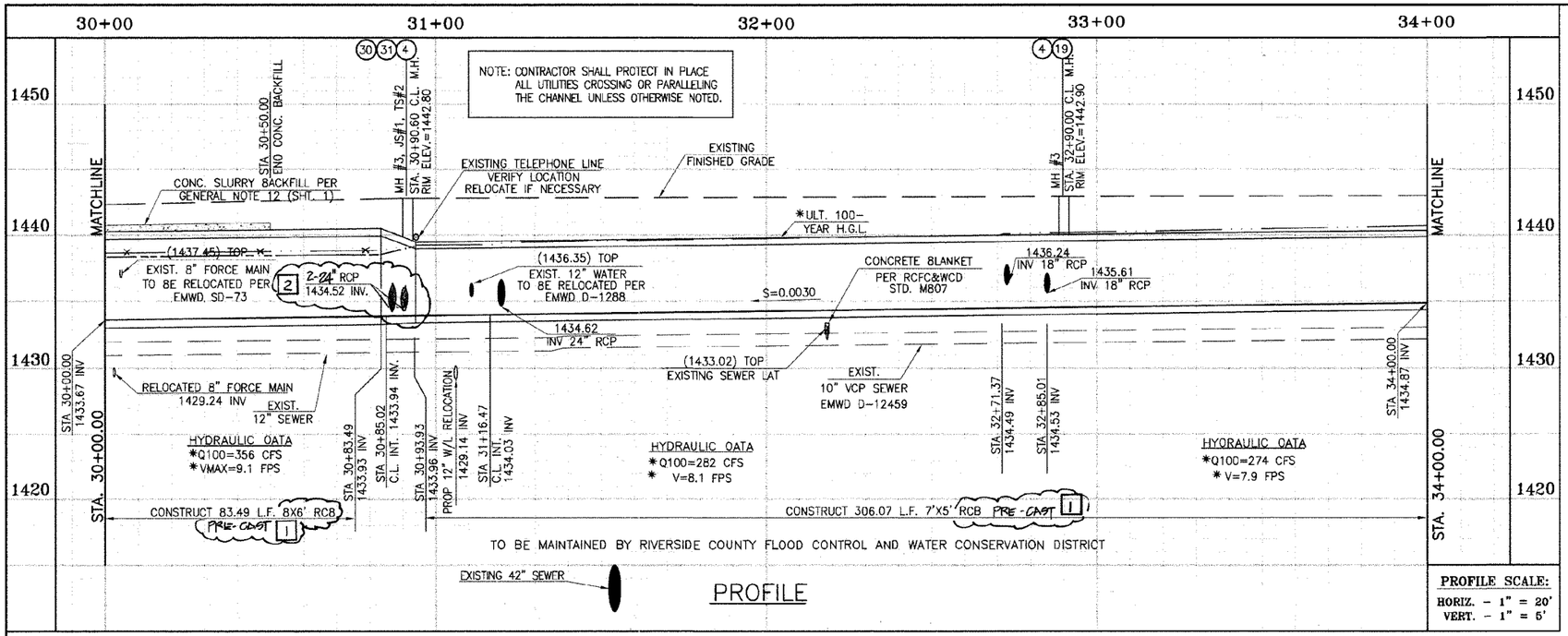
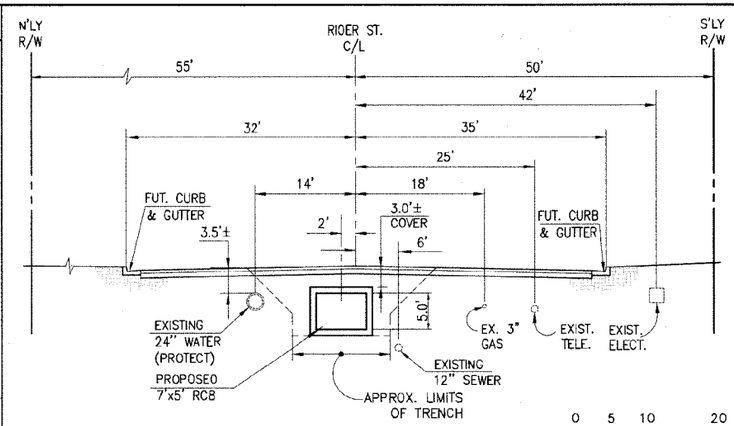




SECTION AT STA. 32+00.00

FROM STA 30+00 TO STA 30+63.55
FROM STA 31+97.19 TO STA 34+00

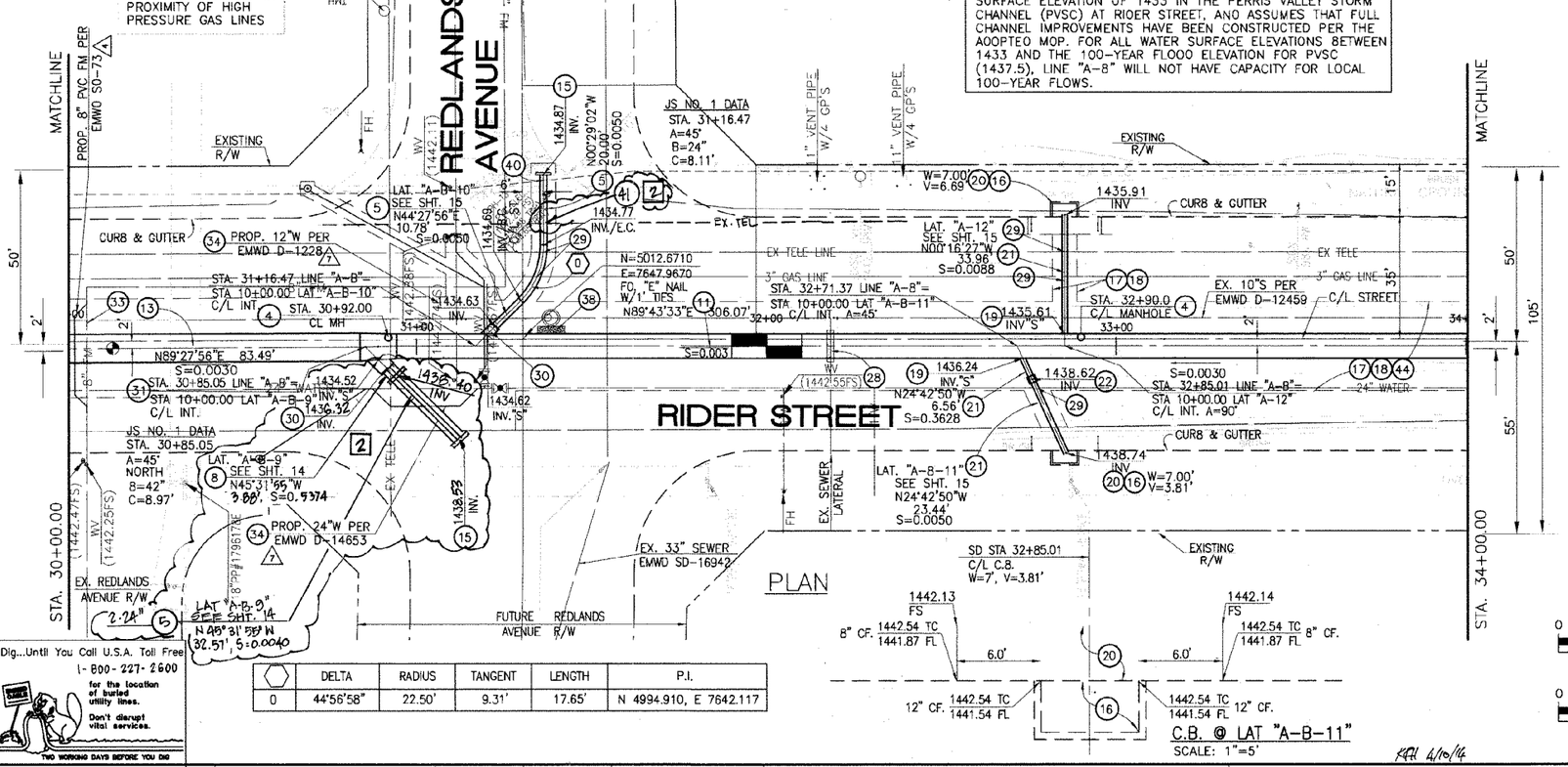
STORM DRAIN CONSTRUCTION NOTES:

4. CONSTRUCT MANHOLE NO. 3 PER R.C.F.C.&W.C.D. STD DWG. MH253
5. CONSTRUCT 24" R.C.P, D-LOAD PER PLAN.
8. CONSTRUCT 42" R.C.P, D-LOAD PER PLAN.
11. CONSTRUCT 7' X 5' ~~RCB PER CALTRANS STD PLAN NO. B86~~ PRE-CAST RCB PER STD PLAN 3900 OR APPROVED EQUAL. ~~SEE JOINT SEALANT NOTE ON SHT. 1~~
13. CONSTRUCT 8' X 6' ~~RCB PER CALTRANS STD PLAN NO. B86~~ PRE-CAST RCB STD PLAN 3900 OR APPROVED EQUAL. ~~SEE JOINT SEALANT NOTE ON SHT. 1~~
15. CONSTRUCT CONCRETE BULKHEAD PER R.C.F.C.&W.C.D. STD DWG. M816.
16. CONSTRUCT CATCH BASIN NO.1 PER R.C.F.C.&W.C.D. STD. DWG. CB100
17. SAWCUT AND REMOVE EXISTING A.C. PAVEMENT.
18. UTILITY TRENCH AND SURFACE REPAIR PER CITY STANDARD ON SHT. NO. 18, MODIFIED TO ACCOMMODATE SLURRY BACKFILL WHERE BOX COVER IS LESS THAN 2.0'.
19. CONSTRUCT JUNCTION STRUCTURE NO.3 PER R.C.F.C.&W.C.D. STD. DWG. JS228.
20. CONSTRUCT LOCAL DEPRESSION NO. 2 CASE "B" PER R.C.F.C.&W.C.D. STD. DWG. LD201.
21. CONSTRUCT 18" R.C.P, D-LOAD PER PLAN.
22. CONSTRUCT CONCRETE COLLAR PER R.C.F.C.&W.C.D. STD DWG. M803.
28. CONSTRUCT SEWER PROTECTION PER R.C.F.C.&W.C.D. STD. DWG. M807.
29. PROTECT IN PLASE EXISTING UTILITIES.
30. CONSTRUCT JUNCTION STRUCTURE NO.1 PER R.C.F.C.&W.C.D. STD. DWG. JS226.
31. CONSTRUCT TRANSITION STRUCTURE NO.2 PER R.C.F.C.&W.C.D. STD. DWG. TS302.
33. RELOCATE EXISTING SEWER LATERALS PER E.M.W.D. PLANS.
34. RELOCATE EXISTING WATER LINE PER E.M.W.D. PLANS.
38. SLURRY BACKFILL BETWEEN RCB AND MANHOLE.
40. RELOCATE EXISTING ELECTRICAL LINE.
44. SAWCUT, REMOVE AND REPLACE A.C. PAVEMENT SURFACE REPAIR PER CITY STD. ON SHEET 18. SEE SEPARATE PAVING PLANS.

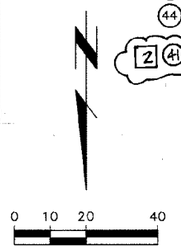
2 41 RELOCATE EXISTING TELEPHONE LINE.

CAUTION: PROPOSED WORK IS IN PROXIMITY OF HIGH PRESSURE GAS LINES

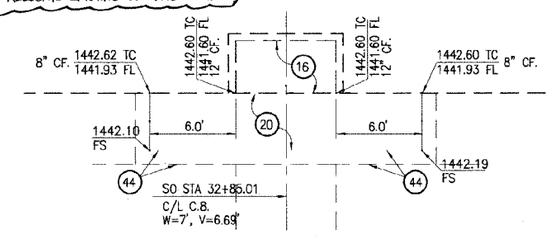
* THE ULTIMATE H.G.L. IS BASED ON THE ADOPTED MDP WATER SURFACE ELEVATION OF 1433 IN THE PERRIS VALLEY STORM CHANNEL (PVSC) AT RIOER STREET, AND ASSUMES THAT FULL CHANNEL IMPROVEMENTS HAVE BEEN CONSTRUCTED PER THE AOOPTED MOP. FOR ALL WATER SURFACE ELEVATIONS BETWEEN 1433 AND THE 100-YEAR FLOOD ELEVATION FOR PVSC (1437.5), LINE "A-8" WILL NOT HAVE CAPACITY FOR LOCAL 100-YEAR FLOWS.



	DELTA	RADIUS	TANGENT	LENGTH	P.I.
0	44°56'58"	22.50'	9.31'	17.65'	N 4994.910, E 7642.117



C.B. @ LAT "A-B-11"
SCALE: 1"=5'



C.B. @ LAT "A-B-12"
SCALE: 1"=5'

Don't Dig...Until You Call U.S.A. Toll Free 1-800-227-2600 for the location of buried utility lines. Don't disrupt vital services.
TWO WORKING DAYS BEFORE YOU DIG

BENCH MARK
COUNTY OF RIVERSIDE BENCHMARK NO. "A-31"
COUNTY OF RIVERSIDE BENCHMARK - 3 1/4" ALUMINUM DISK MARKED "A-31", LOCATED FLUSH AT THE SOUTH WEST CORNER OF BRIDGE ON TOP OF SIDEWALK NEAR FACE OF CURB LOCATED AT THE CROSSING OF PERRIS BLVD. AND RM. CO. FLOOD CONTROL CHANNEL (PERRIS LATERAL 7), 63 FT. WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE BARRIER. (EDGE OF BRIDGE) MARKED A-102 D.M.S. IN TOP OF CONC. POST FLUSH W/ GROUND
ELEVATION = 1474.674' (NAVD 1929)

REF.	REVISIONS	ENGINEER APPR.	ENGINEER DATE	RCFC/ APPR.	RCFC/ DATE
2	CHANGED SLOPE TO 0.003, ADDED MH, ADDED LOTS, CHANGED A2"LAT TO 1A"LAT, ADDED BC UTILITIES, RELOCATE UTILITIES, REV. S.D.	H.I.A	2/16/16	2/15	2/23/16
1	CHANGED C.I.P. RCB TO PRE-CAST RCB PER A.P.W.A. STD	H.I.A	2/16/16	2/15	2/23/16

DESIGNED BY: BW
DRAWN BY: ET
DATE DRAWN:

APPROVED BY: Thienes Engineering, Inc. CIVIL ENGINEERING • LAND SURVEYING 14349 FIRESTONE BOULEVARD LA MIRADA, CALIFORNIA 90638 PH.(714)521-4811 FAX(714)521-4173
Haidook L. Aghaian Date: 11/18/14
HAIDOOK L. AGHAIAN RCE NO. 43293
REGISTERED PROFESSIONAL ENGINEER HAIDOOK L AGHAIAN RCE. NO. 43293 Exp. 3-31-16 CIVIL STATE OF CALIFORNIA

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 1/29/2015
APPROVED BY: DATE: 11/20/2015

CITY OF PERRIS APPROVED BY:
CITY ENGINEER DATE: 12-15-14
RECOMMENDED DATE:

KFH 4/10/14

PERRIS VALLEY MDP LINE "A-B"

FROM STA. 30+00 TO STA. 34+00

CITY OF PERRIS FILE NO. P8-1013
PROJECT NO. 4-0-00537
DRAWING NO. 4-1063
SHEET NO. 7 OF 18

Last Update: 11/18/14
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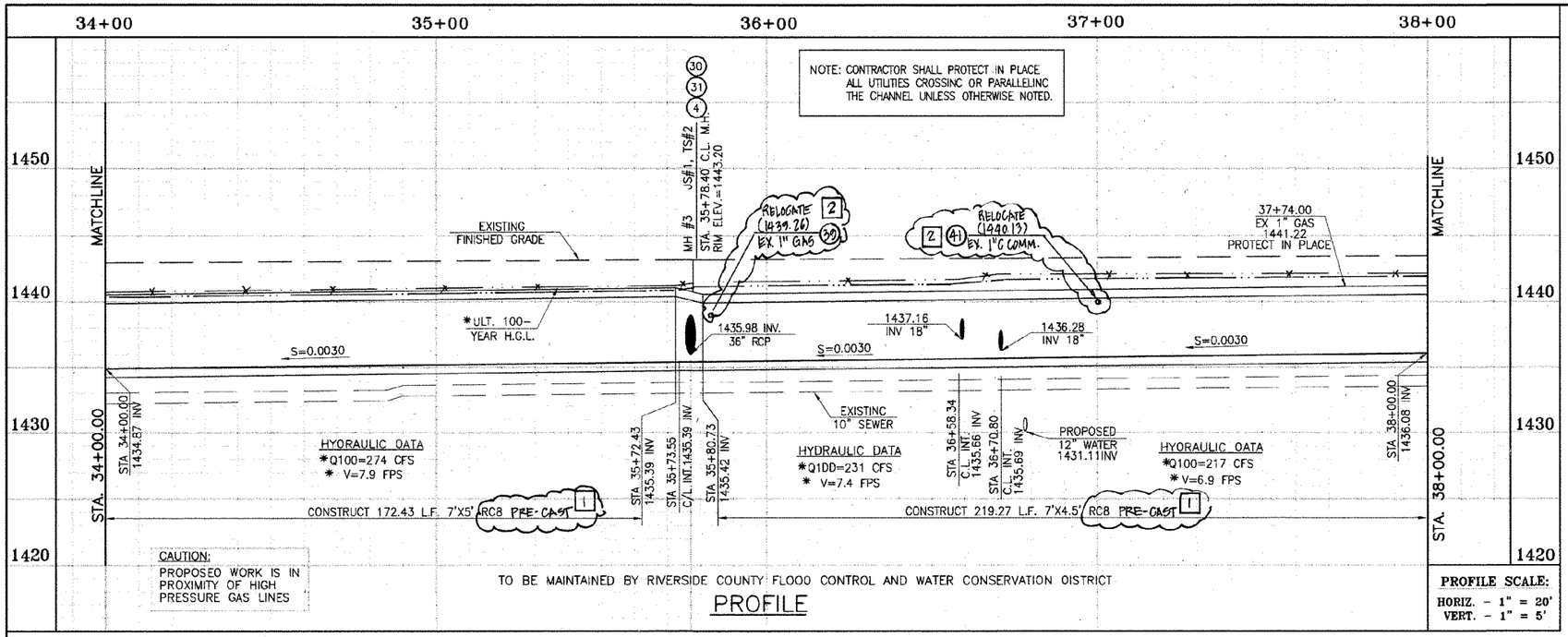
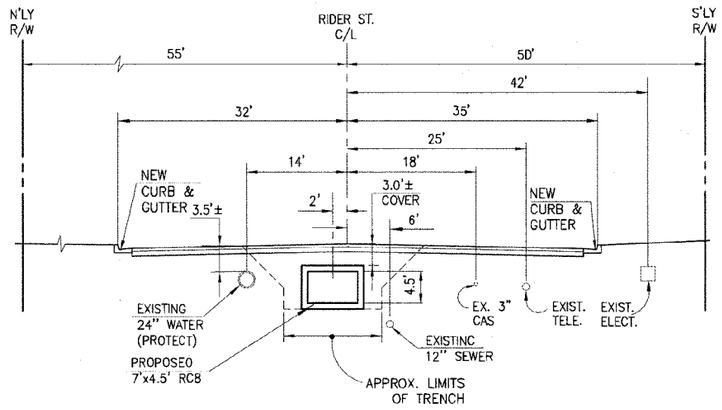




SECTION AT STA. 36+00.00

FROM STA 34+00 TO STA 35+62.28
FROM STA 36+52.28 TO STA 38+00

0 5 10 20
SCALE:1"=10'

STORM DRAIN CONSTRUCTION NOTES:

(4) CONSTRUCT MANHOLE NO. 3 PER R.C.F.C.&W.C.D. STD DWG. MH253

(7) CONSTRUCT 36" R.C.P, D-LOAD PER PLAN.

(1) (10) CONSTRUCT 7' x 4.5' ~~PER CALTRANS STD PLAN D80~~ PRE-CAST RCB APWA STD PLAN 330-0 OR APPROVED EQUAL. ~~SEE JOINT~~ SEALANT NOTE ON SHT. 1.

(1) (11) CONSTRUCT 7' X 5' ~~RCB PER CALTRANS STD PLAN D80~~ PRE-CAST RCB APWA STD PLAN 330-0 OR APPROVED EQUAL. ~~SEE JOINT SEALANT ON SHT. 1.~~

(15) CONSTRUCT CONCRETE BULKHEAD PER R.C.F.C.&W.C.D. STD DWG. M816.

(16) CONSTRUCT CATCH BASIN NO.1 PER R.C.F.C.&W.C.D. STD. DWG. C8100

(17) SAWCUT AND REMOVE EXISTINC A.C. PAVEMENT.

(18) UTILITY TRENCH AND SURFACE REPAIR PER CITY STANDARD ON SHT. NO. 18, MODIFIED TO ACCOMMODATE SLURRY BACKFILL WHERE 80X COVER IS LESS THAN 2.0'.

(19) CONSTRUCT JUNCTION STRUCTURE NO. 3 PER R.C.F.C.&W.C.D. STD. DWG. JS228.

(20) CONSTRUCT LOCAL DEPRESSION #2 CASE "B" PER R.C.F.C.&W.C.D. STD. DWG. LD201.

(21) CONSTRUCT 18" R.C.P, D-LOAD PER PLAN.

(22) CONSTRUCT CONCRETE COLLAR PER R.C.F.C.&W.C.D. STD DWG. M803.

(29) PROTECT IN PLACE EXISTING UTILITIES.

(30) CONSTRUCT JUNCTION STRUCTURE NO. 1 PER R.C.F.C.&W.C.D. STD. DWG. JS226.

(31) CONSTRUCT TRANSITION STRUCTURE NO. 2 PER R.C.F.C.&W.C.D. STD. DWG. TS302.

(34) RELOCATE EXISTING WATER LINE PER E.M.W.D. PLANS.

(38) SLURRY BACKFILL BETWEEN RC8 AND MANHOLE.

(39) RELOCATE EXISTINC GAS LINE.

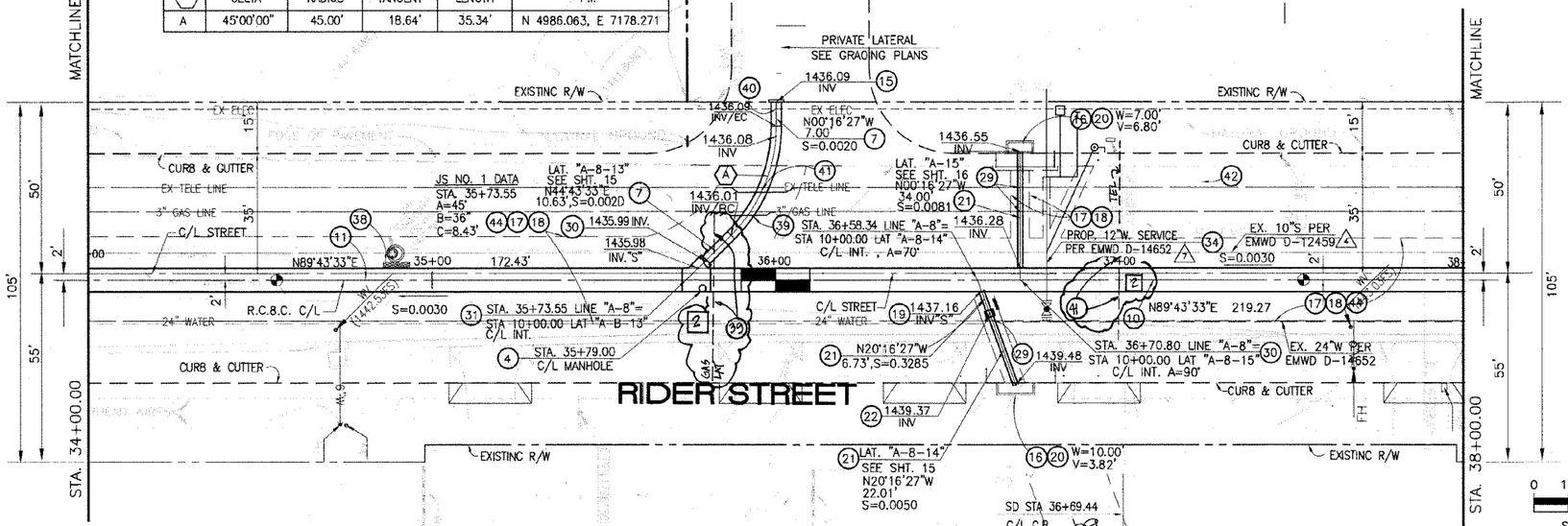
(40) RELOCATE EXISTINC ELECTRICAL LINE.

(41) RELOCATE EXISTINC TELEPHONE LINE.

(42) INSTALL NEW SEWER LATERAL PER E.M.W.D. PLANS.

(44) SAWCUT, REMOVE AND REPLACE A.C. PAVEMENT SURFACE REPAIR PER CITY STD. ON SHEET 18. SEE SEPARATE PAVING PLANS.

	DELTA	RADIUS	TANGENT	LENGTH	P.I.
A	45°00'00"	45.00'	18.64'	35.34'	N 4986.063, E 7178.271

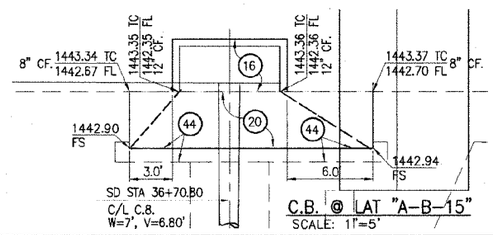


PLAN

0 10 20 40
SCALE:1"=20'

0 2.5 5 10
SCALE:1"=5'

C.B. @ LAT "A-B-14"
SCALE: 1"=5'



C.B. @ LAT "A-B-15"
SCALE: 1"=5'

✳ THE ULTIMATE H.G.L. IS BASED ON THE ADOPTED MDP WATER SURFACE ELEVATION OF 1433 IN THE PERRIS VALLEY STORM CHANNEL (PVSC) AT RIDER STREET, AND ASSUMES THAT FULL CHANNEL IMPROVEMENTS HAVE BEEN CONSTRUCTED PER THE ADOPTED MDP. FOR ALL WATER SURFACE ELEVATIONS BETWEEN 1433 AND THE 100-YEAR FLOOD ELEVATION FOR PVSC (1437.5), LINE "A-B" WILL NOT HAVE CAPACITY FOR LOCAL 100-YEAR FLOWS.

BENCH MARK
COUNTY OF RIVERSIDE BENCHMARK NO. "K-31"
COUNTY OF RIVERSIDE BENCHMARK - 3 1/4" ALUMINUM DISK MARKED K-31, LOCATED FLUSH AT THE SOUTH WEST CORNER OF BRIDGE ON TOP OF SIDEWALK NEAR FACE OF CURB LOCATED AT THE CROSSING OF PERRIS BLVD. AND RIV. CO. FLOOD CONTROL CHANNEL (PERRIS LATERAL "A"), 43 FT. WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE RAILING. (EDGE OF BRIDGE) MARKED P-102 D.W.R. IN TOP OF CONC. POST FLUSH W/ GROUND
ELEVATION = 1474.674' (NAVD 1929)

REF.	REVISIONS	ENGINEER APPR.	ENGINEER DATE	RCFC/ APPR.	RCFC/ DATE
2	CHANGED SLOPE TO 0.00%, ADDED MH, ADDED 10'S, CHANGED 42" LAT TO 24" LAT, ADDED EX. UTILITIES, RELOCATE UTILITIES, REV. SD.	H.I.A	2/6/16	N/A	2/23/16
1	CHANGED C.I.P. RCB TO PRECAST RCB APWA 330-0	H.I.A	2/6/16	N/A	2/23/16

DESIGNED BY: BW
DRAWN BY: ET
DATE DRAWN:

APPROVED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173
HAIDOOK I. AGHAJAN — Date: 11/18/14
HAIDOOK I. AGHAJAN RCE NO. 43293

REGISTERED PROFESSIONAL ENGINEER HAIDOOK I. AGHAJAN R.C.E. NO. 43293 Exp. 3-31-16 CIVIL STATE OF CALIFORNIA

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 1/20/2015
APPROVED BY: DATE: 1/20/2015

CITY OF PERRIS
APPROVED BY:
CITY ENGINEER DATE: 12-15-14
RECOMMENDED DATE:

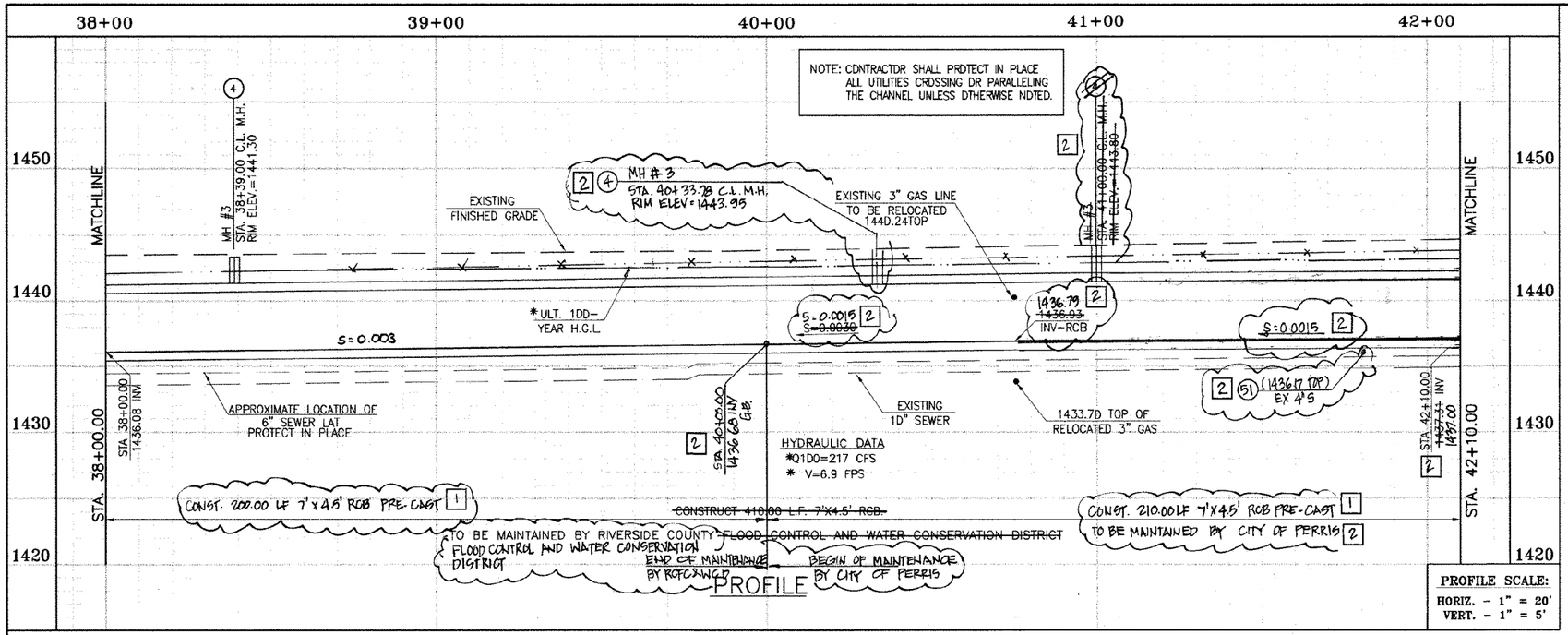
PERRIS VALLEY MDP LINE "A-B"

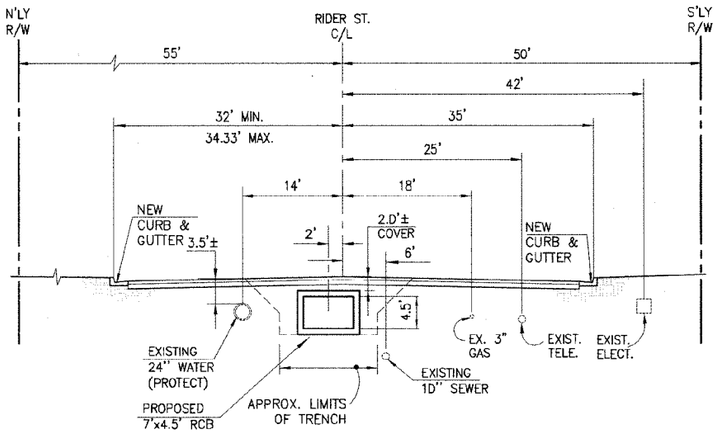
FROM STA. 34+00 TO STA. 38+00

CITY OF PERRIS FILE NO. P8-1013

PROJECT NO. 4-0-00537
DRAWING NO. 4-1063
SHEET NO. 8 OF 18

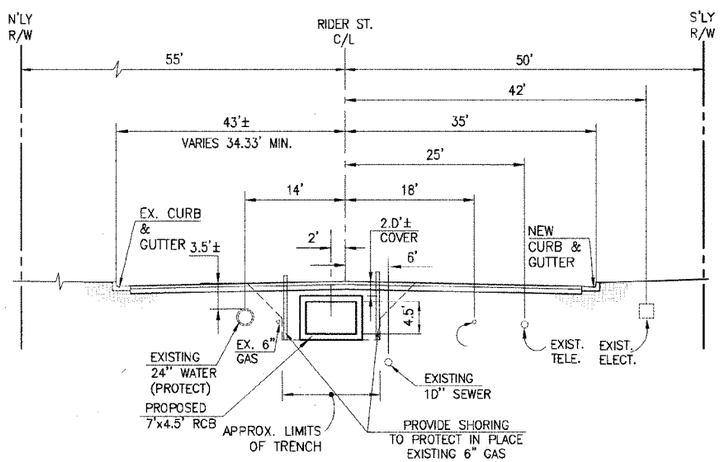
Last Update: 11/18/14
O:\2700-2799\2702\2702F\2702SD08.dwg





SECTION AT STA. 40+00.00
FROM STA 38+00 TO STA 41+14.24

0 5 10 20
SCALE:1"=10'

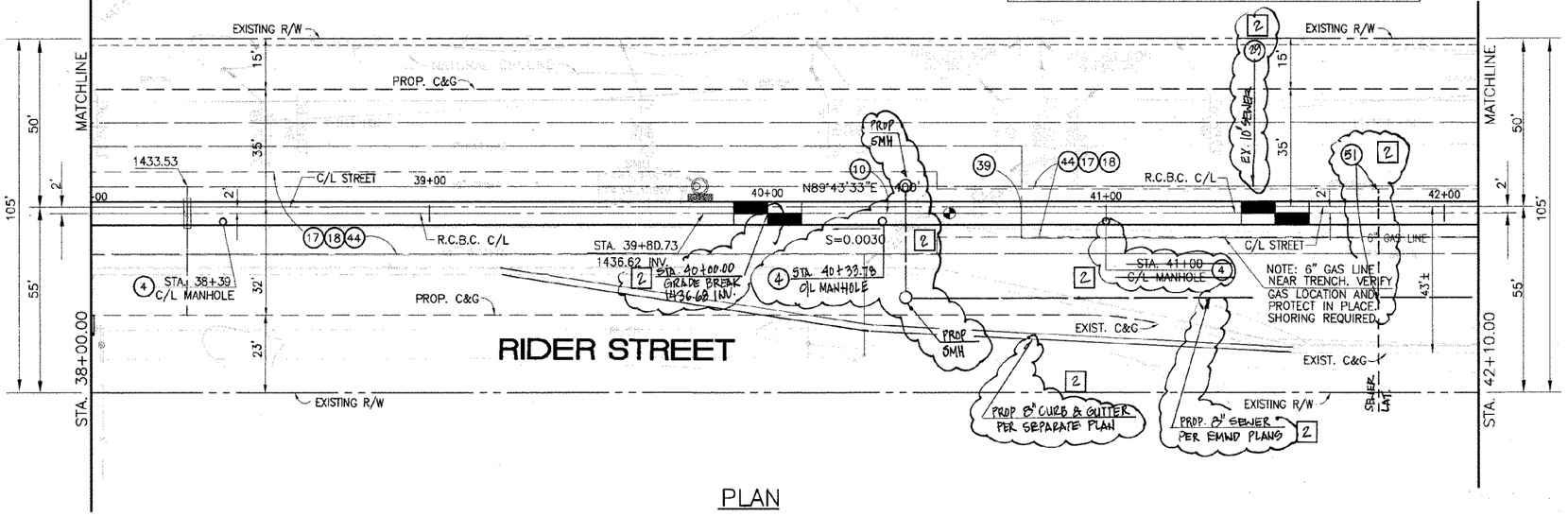


SECTION AT STA. 41+50.00
FROM STA 41+14.24 TO STA 42+10

0 5 10 20
SCALE:1"=10'

CAUTION:
PROPOSED WORK IS IN PROXIMITY OF HIGH PRESSURE GAS LINES

✳ THE ULTIMATE H.G.L. IS BASED ON THE ADOPTED MDP WATER SURFACE ELEVATION OF 1433 IN THE PERRIS VALLEY STORM CHANNEL (PVSC) AT RIDER STREET, AND ASSUMES THAT FULL CHANNEL IMPROVEMENTS HAVE BEEN CONSTRUCTED PER THE ADOPTED MDP. FOR ALL WATER SURFACE ELEVATIONS BETWEEN 1433 AND THE 100-YEAR FLOOD ELEVATION FOR PVSC (1437.5), LINE "A-B" WILL NOT HAVE CAPACITY FOR LOCAL 100-YEAR FLOWS.



PLAN

STORM DRAIN CONSTRUCTION NOTES:

(4) CONSTRUCT MANHOLE #3 PER R.C.F.C.&W.C.D. STD DWG. MH253.

[1] (10) CONSTRUCT 7' X 4.5' ~~RCB PER CALTRANS STD PLAN D88.~~ PRE-CAST RCB APWA STD PLAN 330-0 OR APPROVED EQUAL. SEE JOINT SEALANT NOTE ON SHT. 1.

(17) SAWCUT AND REMOVE EXISTING A.C. PAVEMENT.

(18) UTILITY TRENCH AND SURFACE REPAIR PER CITY STANDARD ON SHT. NO. 18, MODIFIED TO ACCOMMODATE SLURRY BACKFILL WHERE BOX COVER IS LESS THAN 2.D'.

(28) CONSTRUCT SEWER PROTECTION PER R.C.F.C.&W.C.D. STD. DWG. M8D7.

(44) SAWCUT, REMOVE AND REPLACE A.C. PAVEMENT SURFACE REPAIR PER CITY STD. ON SHEET 18. SEE SEPARATE PAVING PLANS.

(20) PROTECT IN PLACE EXISTING UTILITIES.

[2] (51) REMOVE EXISTING SEWER LATERALS PER EMWD PLANS

0 10 20 40
SCALE:1"=20'

Don't Dig...Until You Call U.S.A. Toll Free
1-800-227-2600
for the location of buried utility lines.
Don't disrupt vital services.
TWO WORKING DAYS BEFORE YOU DIG

BENCH MARK
COUNTY OF RIVERSIDE BENCHMARK NO. "H-31"
COUNTY OF RIVERSIDE BENCHMARK - 3 1/4" ALUMINUM DISK MARKED H-31, LOCATED FLUSH AT THE SOUTH WEST CORNER OF BRIDGE ON TOP OF SIDEWALK NEAR FACE OF CURB LOCATED AT THE CROSSING OF PERRIS BLVD. AND RIV. CO. FLOOD CONTROL CHANNEL (PERRIS LATERAL 7-7), 43 FT. WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE BARRIER. (EDGE OF BRIDGE) MARKED B-102 D.W.R. IN TOP OF CONC. POST FLUSH W/ GROUND
ELEVATION = 1474.874' (NAVD 1929)

REF	DESCRIPTION	ENGINEER APPR.	ENGINEER DATE	RCFC/ APPR.	RCFC/ DATE
	REVISIONS				
[2]	CHANGED SLOPE TO 0.0018, ADDED MH, WIDENED 10'S, CHANGED 42" LAT TO 24" LAT, ADDED EX. UTILITIES, RELOCATE UTILITIES, REV. S.D.	H.I.A.	2/3/16	DG	2/23/16
[1]	CHANGED C.I.P. RCB TO PRE-CAST RCB APWA 390-0	H.I.A.	2/3/16	DG	2/23/16

DESIGNED BY: BW
DRAWN BY: ET
DATE DRAWN:

APPROVED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARO
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173
HAIDOOK I. AGHAIAN — Date: 11/18/14
RCE NO. 43293

REGISTERED PROFESSIONAL ENGINEER HAIDOOK I. AGHAIAN R.C.E. NO. 43293 Exp. 3-31-16 CIVIL STATE OF CALIFORNIA

RKH 4/10/14

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 4/14/2015
APPROVED BY: Mark A. Wills DATE: 4/20/2015

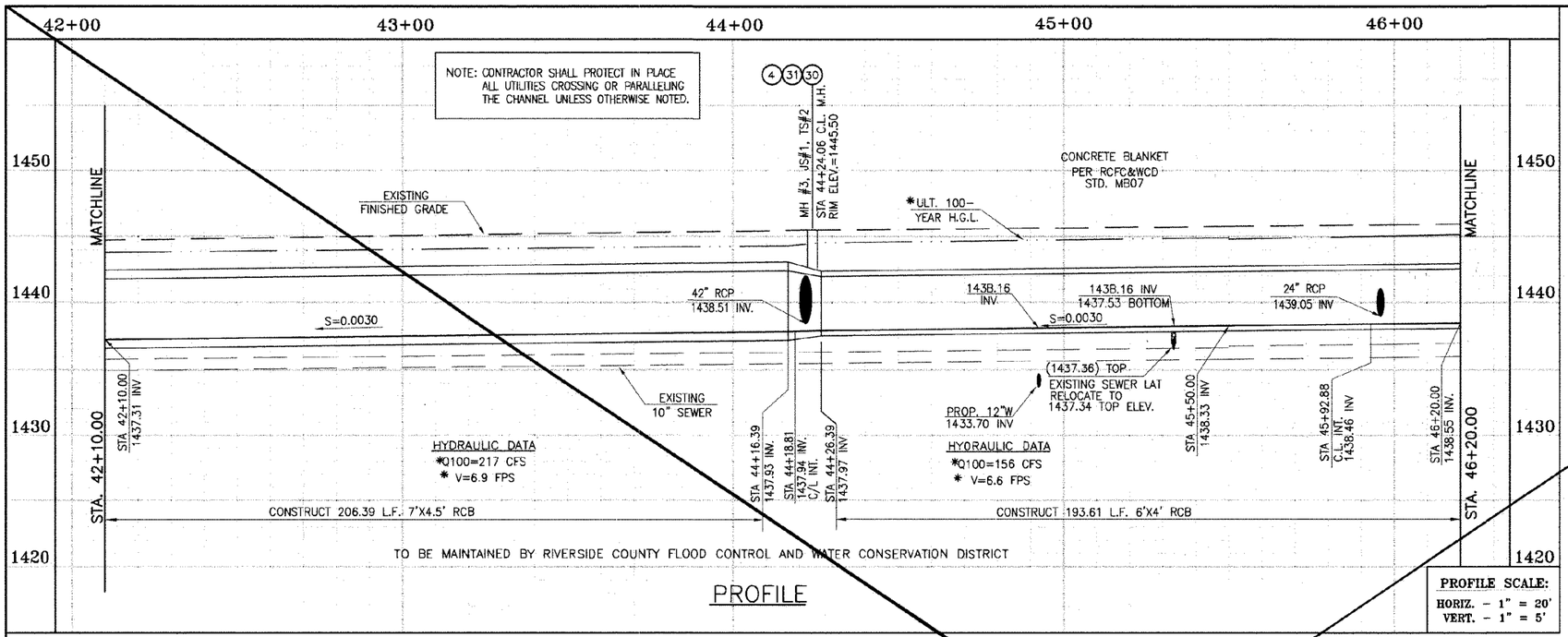
CITY OF PERRIS
APPROVED BY: CITY ENGINEER DATE: 12-15-14
RECOMMENDED DATE:

CITY OF PERRIS
FILE NO. P8-1013

PERRIS VALLEY MDP
LINE "A-B"
FROM STA. 38+00 TO STA. 42+00

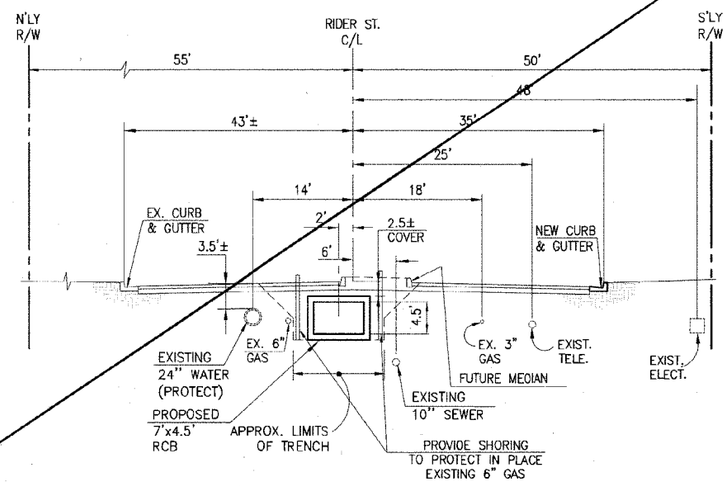
PROJECT NO. 4-0-00537
DRAWING NO. 4-1063
SHEET NO. 9 OF 18

Last Update: 11/18/14
O:\2700-2799\2702\2702F\27025D09.dwg



PROFILE

PROFILE SCALE:
HORIZ. - 1" = 20'
VERT. - 1" = 5'

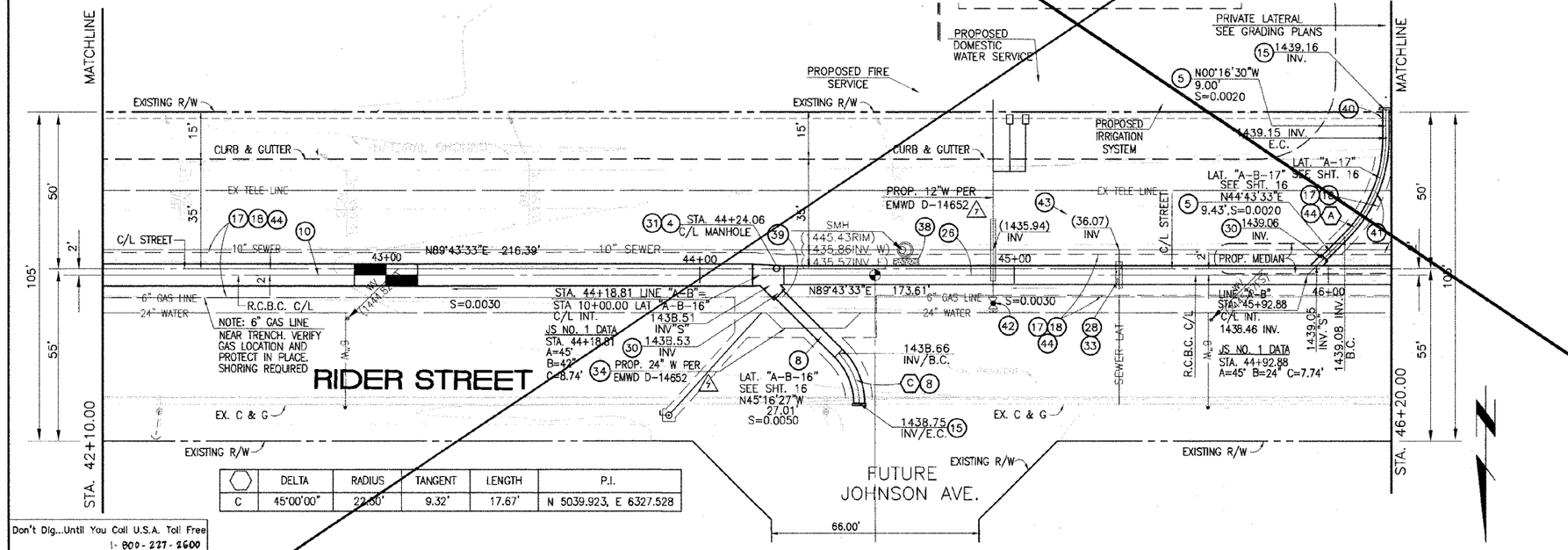


SECTION AT STA. 43+00.00

FROM STA 42+10.00 TO STA 45+77.27

0 5 10 20
SCALE:1"=10'

CAUTION:
PROPOSED WORK IS IN PROXIMITY OF HIGH PRESSURE GAS LINES



	DELTA	RADIUS	TANGENT	LENGTH	P.I.
C	45°00'00"	22.50'	9.32'	17.67'	N 5039.923, E 6327.528

PLAN

0 10 20 40
SCALE:1"=20'

✳ THE ULTIMATE H.G.L. IS BASED ON THE ADOPTED MDP WATER SURFACE ELEVATION OF 1433 IN THE PERRIS VALLEY STORM CHANNEL (PVSC) AT RIDER STREET, AND ASSUMES THAT FULL CHANNEL IMPROVEMENTS HAVE BEEN CONSTRUCTED PER THE ADOPTED MDP. FOR ALL WATER SURFACE ELEVATIONS BETWEEN 1433 AND THE 100-YEAR FLOOD ELEVATION FOR PVSC (1437.5), LINE "A-B" WILL NOT HAVE CAPACITY FOR LOCAL 100-YEAR FLOWS.

STORM DRAIN CONSTRUCTION NOTES:

(4) CONSTRUCT MANHOLE NO. 3 PER R.C.F.C.&W.C.O. STD OWG. MH253
(5) CONSTRUCT 24" R.C.P, D-LOAD PER PLAN.
(7) CONSTRUCT 36" R.C.P, D-LOAD PER PLAN.
(8) CONSTRUCT 42" R.C.P, D-LOAD PER PLAN.
(10) CONSTRUCT 7' x 4.5' RCB PER CALTRANS STD PLAN NO. D80 OR APPROVED EQUAL.
(15) CONSTRUCT CONCRETE BULKHEAD PER R.C.F.C.&W.C.O. STD OWG. M816.
(17) SAWCUT AND REMOVE EXISTING A.C. PAVEMENT.
(18) UTILITY TRENCH AND SURFACE REPAIR PER CITY STANDARD ON SHT. NO. 18, MODIFIED TO ACCOMMODATE SLURRY BACKFILL WHERE BOX COVER IS LESS THAN 2.0'.
(26) CONSTRUCT 6' X 4' RCB PER CALTRANS STD PLAN NO. D80. OR APPROVED EQUAL.
(28) CONSTRUCT SEWER PROTECTION PER R.C.F.C.&W.C.O. STD. OWG. M807.
(30) CONSTRUCT JUNCTION STRUCTURE NO.1 PER R.C.F.C.&W.C.D. STD. DWG. JS226.
(31) CONSTRUCT TRANSITION STRUCTURE NO. 2 PER R.C.F.C.&W.C.D. STD. DWG. TS302.
(33) RELOCATE EXISTING 6" SEWER LAT. PER E.M.W.D. PLANES
(34) RELOCATE EXISTING WATER LINE PER E.M.W.D. PLANS.
(38) SLURRY BACKFILL BETWEEN RCB AND MANHOLE.
(39) RELOCATE EXISTING GAS LINE.
(40) RELOCATE EXISTING ELECTRICAL LINE.
(41) RELOCATE EXISTING TELEPHONE LINE.
(42) CONSTRUCT PROPOSED 12" WATER MAIN, PER E.M.W.D. PLANS.
(43) CONSTRUCT PROPOSED 6" SEWER LATERAL, PER E.M.W.D. PLANS.
(44) SAWCUT, REMOVE AND REPLACE A.C. PAVEMENT SURFACE REPAIR PER CITY STD. ON SHEET 18. SEE SEPARTE PAVING PLANS.

Don't Dig...Until You Call U.S.A. Toll Free 1-800-227-2600 for the location of buried utility lines. Don't disrupt vital services. TWO WORKING DAYS BEFORE YOU DIG

RH 4/18/14

BENCH MARK
COUNTY OF RIVERSIDE BENCHMARK NO. "M-31"
COUNTY OF RIVERSIDE BENCHMARK DISK 3 1/4" ALUMINUM DISK MARKED M-31, LOCATED FLUSH IN THE SOUTH WEST CORNER OF BRIDGE ON TOP OF SIDEWALK NEAR FACE OF CURB LOCATED AT THE CROSSING OF PERRIS BLVD. AND RIV. CO. FLOOD CONTROL CHANNEL (PERRIS LATERAL "A") 43 FT. WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE BARRIER, EDGE OF BRIDGE) MARKED ELEV. D.W.R. IN TOP OF CONC. POST FLUSH W/ GROUND
ELEVATION = 1474.674' (NAVD 1929)

REF.	REVISIONS	ENGINEER APPR.	ENGINEER DATE	RCFC/ APPR.	RCFC/ DATE
	SHEET SUPERSEDED BY 10A	HH	2/12/16	DG	2/25/16

DESIGNED BY: BW
DRAWN BY: ET
DATE DRAWN:

APPROVED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173
HAIDOOK I. AGHAIAN Date: 11/18/14
RCE NO. 43293

REGISTERED PROFESSIONAL ENGINEER HAIDOOK I. AGHAIAN R.C.E. NO. 43293 Exp. 3-31-16 CIVIL STATE OF CALIFORNIA

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 4/28/2015
APPROVED BY: DATE: 4/28/2015

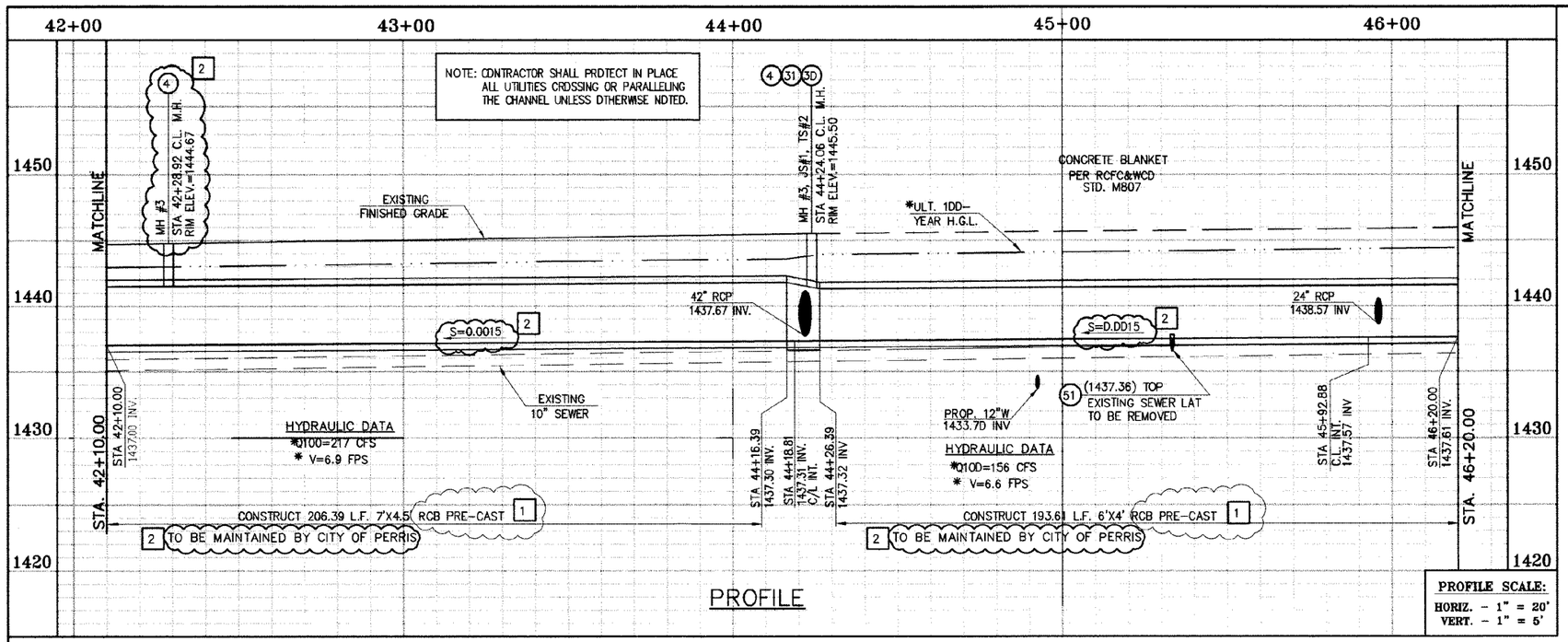
CITY OF PERRIS
APPROVED BY:
DIR. ENGINEER DATE: 12-15-14
RECOMMENDED DATE:

PERRIS VALLEY MDP LINE "A-B"

FROM STA. 42+10 TO STA. 46+20

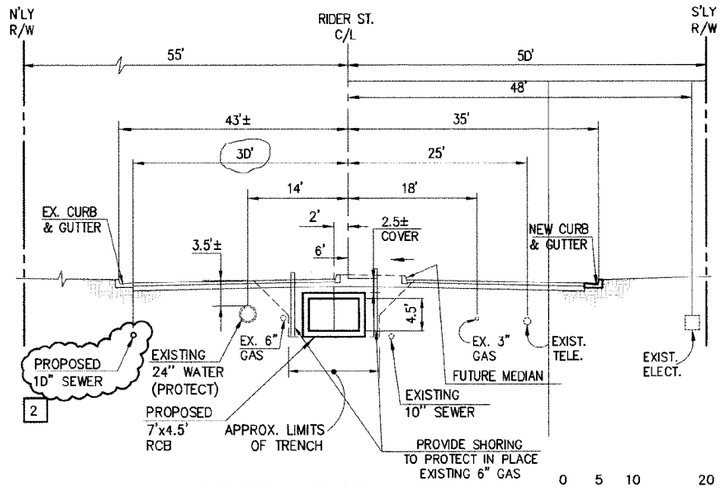
CITY OF PERRIS FILE NO. P8-1013
PROJECT NO. 4-0-00537
DRAWING NO. 4-1063
SHEET NO. 10 OF 18

Last Update: 11/18/14
O:\2700-2799\2702\2702F\27025010.dwg



PROFILE

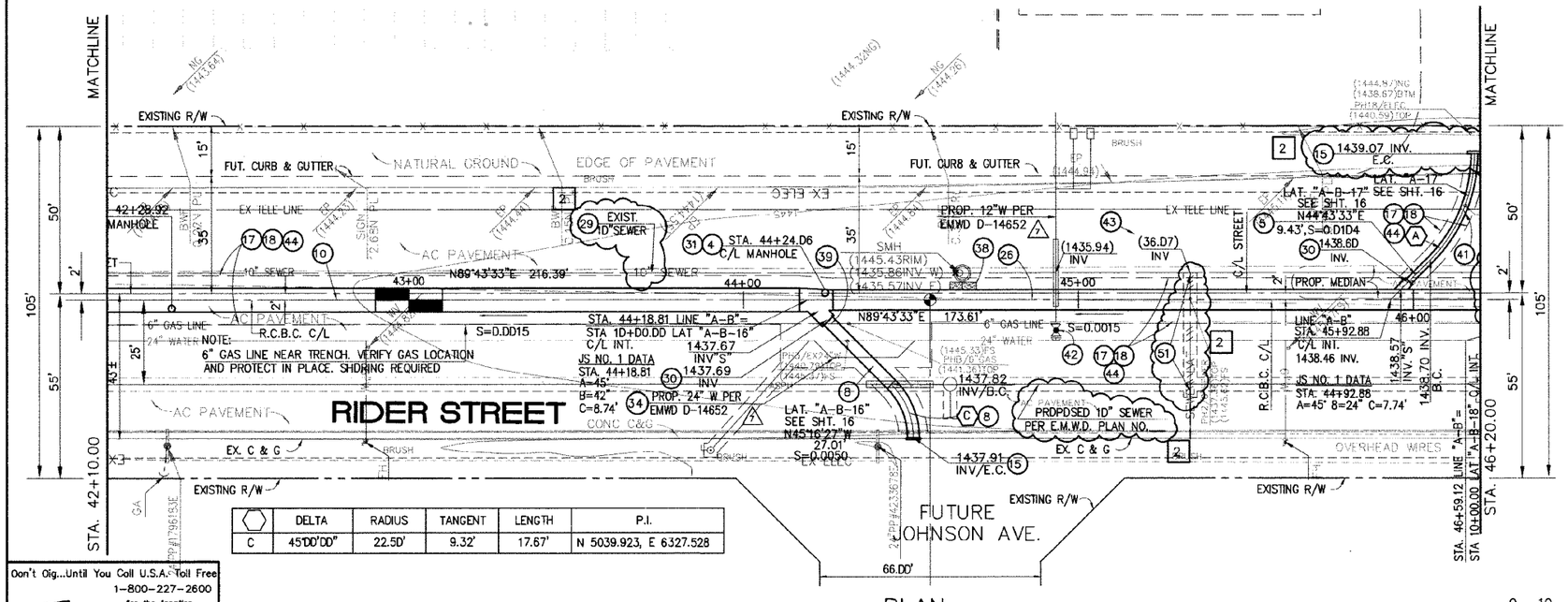
PROFILE SCALE:
HORIZ. - 1" = 20'
VERT. - 1" = 5'



SECTION AT STA. 43+00.00
FROM STA 42+10.00 TO STA 45+77.27

* THE ULTIMATE H.G.L. IS BASED ON THE ADOPTED MDP WATER SURFACE ELEVATION OF 1433 IN THE PERRIS VALLEY STORM CHANNEL (PVSC) AT RIDER STREET, AND ASSUMES THAT FULL CHANNEL IMPROVEMENTS HAVE BEEN CONSTRUCTED PER THE ADOPTED MDP. FOR ALL WATER SURFACE ELEVATIONS BETWEEN 1433 AND THE 100-YEAR FLOOD ELEVATION FOR PVSC (1437.5), LINE "A-B" WILL NOT HAVE CAPACITY FOR LOCAL 100-YEAR FLOWS.

CAUTION:
PROPOSED WORK IS IN PROXIMITY OF HIGH PRESSURE GAS LINES



PLAN

	DELTA	RADIUS	TANGENT	LENGTH	P.I.
C	45°DD'DD"	22.5D'	9.32'	17.67'	N 5039.923, E 6327.528

0 10 20 40
SCALE: 1"=20'

STORM DRAIN CONSTRUCTION NOTES:

(4) CONSTRUCT MANHOLE NO. 3 PER R.C.F.C.&W.C.D. STD DWG. MH253
(5) CONSTRUCT 24" R.C.P, D-LOAD PER PLAN.
(7) CONSTRUCT 36" R.C.P, D-LOAD PER PLAN.
(B) CONSTRUCT 42" R.C.P, D-LOAD PER PLAN.
[1] (10) CONSTRUCT 7' X 4.5' PRE-CAST RCB APWA STD PLAN 39D-D OR APPROVED EQUAL. SEE JOINT SEALANT NOTE ON SHEET #1.
(15) CONSTRUCT CONCRETE BULKHEAD PER R.C.F.C.&W.C.D. STD DWG. M816.
(17) SAWCUT AND REMOVE EXISTING A.C. PAVEMENT.
(1B) UTILITY TRENCH AND SURFACE REPAIR PER CITY STANDARD ON SHT. NO. 18, MODIFIED TO ACCOMMODATE SLURRY BACKFILL WHERE BOX COVER IS LESS THAN 2.0'
[1] (26) CONSTRUCT 6' X 4' PRE-CAST RCB APWA STD PLAN 39D-D OR APPOVED EQUAL. SEE JOINT SEALANT NOTE ON SHEET #1.
(2B) CONSTRUCT SEWER PROTECTION PER R.C.F.C.&W.C.D. STD. DWG. M8D7.
(29) PROTECT IN PLACE EXISTING UTILITIES
(30) CONSTRUCT JUNCTION STRUCTURE NO.1 PER R.C.F.C.&W.C.D. STD. DWG. JS226.
(31) CONSTRUCT TRANSITION STRUCTURE NO. 2 PER R.C.F.C.&W.C.D. STD. DWG. TS3D2.
(33) RELOCATE EXISTING 6" SEWER LAT. PER E.M.W.D. PLANS
(34) RELOCATE EXISTING WATER LINE PER E.M.W.D. PLANS.
(3B) SLURRY BACKFILL BETWEEN RCB AND MANHOLE.
(39) RELOCATE EXISTING GAS LINE.
(40) RELOCATE EXISTING ELECTRICAL LINE.
(41) RELOCATE EXISTING TELEPHONE LINE.
(42) CONSTRUCT PROPOSED 12" WATER MAIN, PER E.M.W.D. PLANS.
(43) CONSTRUCT PROPOSED 6" SEWER LATERAL, PER E.M.W.D. PLANS.
(44) SAWCUT, REMOVE AND REPLACE A.C. PAVEMENT SURFACE REPAIR PER CITY STD. ON SHEET 18. SEE SEPARTE PAVING PLANS.
[2] (51) REMOVE EXISTING SEWER LATERALS PER E.M.W.D. PLANS.

Don't Dig...Until You Call U.S.A. Toll Free 1-800-227-2600 for the location of buried utility lines. Don't disrupt vital services.
TWO WORKING DAYS BEFORE YOU DIG

BENCH MARK
COUNTY OF RIVERSIDE BENCHMARK NO. "H-31"
COUNTY OF RIVERSIDE BENCHMARK - 3 1/4" ALUMINUM DISK MARKED M-31, LOCATED FLUSH AT THE SOUTH WEST CORNER OF BRIDGE ON TOP OF SIDEWALK NEAR FACE OF CURB LOCATED AT THE CROSSING OF PERRIS BLVD. AND RIV. CO. FLOOD CONTROL CHANNEL (PERRIS LATERAL "A"), 4.5 FT. WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE BARRIER. (EDGE OF BRIDGE) MARKED R-102 CLOVE IN TOP OF CONC. POST FLUSH W/ GROUND
ELEVATION = 1474.674' (NAVD 1929)

	REVISIONS	ENGINEER		RCFC/		DESIGNED BY:
						DRAWN BY:
2	CHANGED SLOPE TO 0.0015, ADDED MH, ADDED NEW 10"S, CHANGED 42" LAT TO 24" LAT ADDED EX. UTILITIES, RELOCATE UTILITIES, REVISED SD	H.I.A.	2/29/16	0/6	2/17/16	DATE DRAWN:
1	CHANGED CAST IN PLACE RCB TO PRE-CAST RCB PER APWA 390-D	H.I.A.	2/29/16	0/6	2/17/16	
REF.	DESCRIPTION	APPR.	DATE	APPR.	DATE	

APPROVED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173
Haidook I. Aghaian Date: 2/1/16
HAIDOOK I. AGHAIAN RCE NO. 43293

REGISTERED PROFESSIONAL ENGINEER HAIDOOK I. AGHAIAN R.C.E. NO. 43293 Exp. 3-31-16 CIVIL STATE OF CALIFORNIA

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

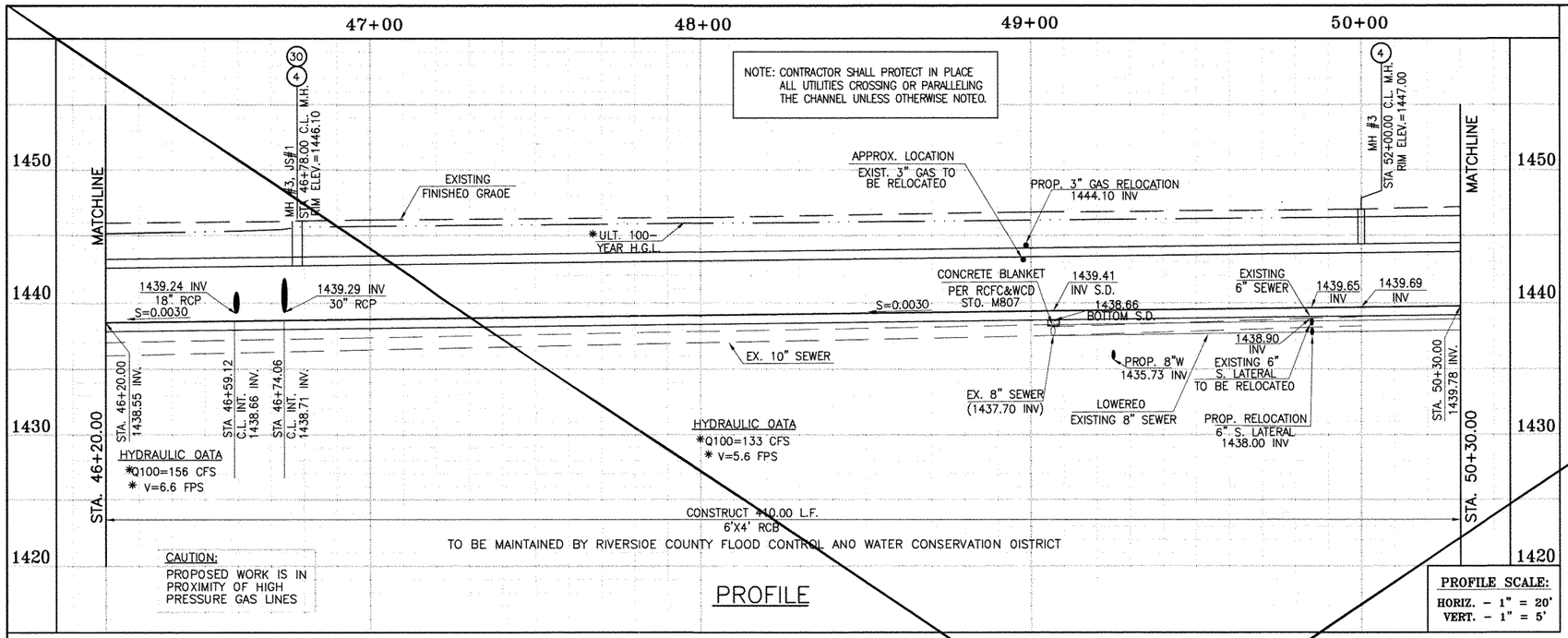
CITY OF PERRIS
APPROVED BY:
CITY ENGINEER DATE: 2-9-16
RECOMMENDED DATE:

CITY OF PERRIS
FILE NO. P8-1013

PERRIS VALLEY MDP
LINE "A-B"
FROM STA. 42+10 TO STA. 46+20

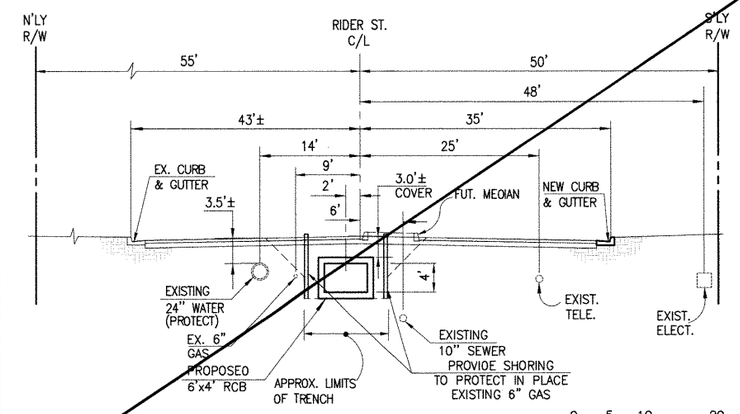
PROJECT NO. 4-0-00537
DRAWING NO. 4-1063
SHEET NO. 10A OF 18

Last Update: 1/20/16
o:\2700-2799\2702\2702F\2702SD10.dwg



PROFILE

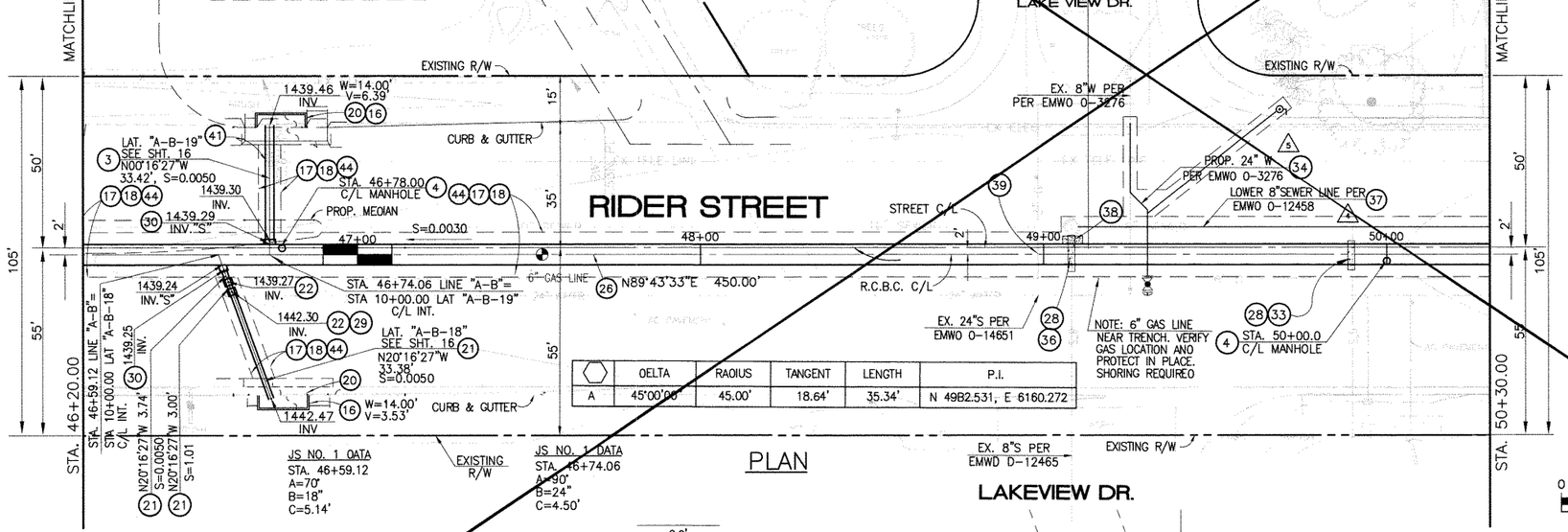
PROFILE SCALE:
HORIZ. - 1" = 20'
VERT. - 1" = 5'



SECTION AT STA. 47+00.00
FROM STA 46+67.27 TO STA 47+76.81

SCALE:1"=10'

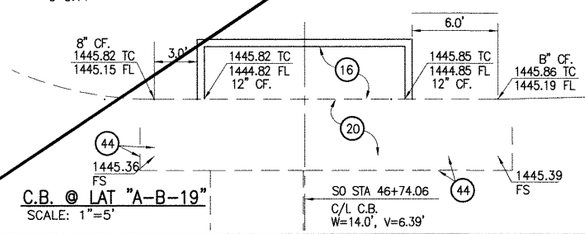
* THE ULTIMATE H.G.L. IS BASED ON THE ADOPTED MDP WATER SURFACE ELEVATION OF 1433 IN THE PERRIS VALLEY STORM CHANNEL (PVSC) AT RIDER STREET, AND ASSUMES THAT FULL CHANNEL IMPROVEMENTS HAVE BEEN CONSTRUCTED PER THE ADOPTED MDP. FOR ALL WATER SURFACE ELEVATIONS BETWEEN 1433 AND THE 100-YEAR FLOOD ELEVATION FOR PVSC (1437.5), LINE "A-B" WILL NOT HAVE CAPACITY FOR LOCAL 100-YEAR FLOWS.



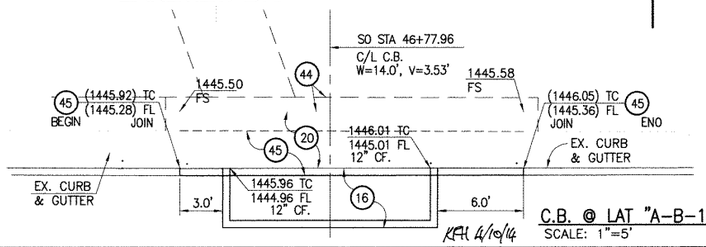
	DELTA	RADIUS	TANGENT	LENGTH	P.I.
A	45°00'00	45.00'	18.64'	35.34'	N 49B2.531, E 6160.272

PLAN

0 10 20 40
SCALE:1"=20'



C.B. @ LAT "A-B-19"
SCALE: 1"=5'



KFH 6/10/14

C.B. @ LAT "A-B-18"
SCALE: 1"=5'

0 2.5 5 10
SCALE:1"=5'

STORM DRAIN CONSTRUCTION NOTES:

(3) CONSTRUCT 30" R.C.P, D-LOAD PER PLAN.
(4) CONSTRUCT MANHOLE NO.3 PER R.C.F.C.&W.C.D. STD OWG. MH253
(16) CONSTRUCT CATCH BASIN NO.1 PER R.C.F.C.&W.C.D. STD. OWG. CB100
(17) SAWCUT AND REMOVE EXISTING A.C. PAVEMENT.
(18) UTILITY TRENCH AND SURFACE REPAIR PER CITY STANDARD ON SHT. NO. 18, MODIFIED TO ACCOMMODATE SLURRY BACKFILL WHERE BOX COVER IS LESS THAN 2.0'.
(20) CONSTRUCT LOCAL DEPRESSION NO. 2 CASE "B" PER R.C.F.C.&W.C.D. STD. OWG. D0201.
(21) CONSTRUCT 18" R.C.P, D-LOAD PER PLAN.
(22) CONSTRUCT CONCRETE COLLAR PER R.C.F.C.&W.C.D. STD OWG. M803.
(26) CONSTRUCT 6' X 4' RCB PER CALTRANS STD PLAN NO. 080. OR APPROVED EQUAL.
(28) CONSTRUCT SEWER PROTECTION PER R.C.F.C.&W.C.D. STD. OWG. M807.
(29) PROTECT IN PLACE EXISTING UTILITY
(30) CONSTRUCT JUNCTION STRUCTURE NO.1 PER R.C.F.C.&W.C.D. STD. OWG. JS226.
(33) RELOCATE EXISTING SEWER LATERALS PER E.M.W.D. PLANS.
(34) RELOCATE EXISTING WATER LINE PER E.M.W.D. PLANS.
(36) INSTALL NEW SEWER LATERAL PER E.MW.D. PLANS.
(37) LOWER EXISTING SEWER MAIN PER E.M.W.D. PLANS.
(38) SLURRY BACKFILL BETWEEN RCB AND MANHOLE.
(39) RELOCATE EXISTING GAS LINE.
(41) RELOCATE EXISTING TELEPHONE LINE.
(44) SAWCUT, REMOVE AND REPLACE A.C. PAVEMENT SURFACE REPAIR PER CITY STD. ON SHEET 18. SEE SEPARATE PAVING PLANS.
(45) REMOVE EXISTING CONCRETE CURB AND GUTTER.

Don't Dig...Until You Call U.S.A. Toll Free 1-800-227-2600 for the location of buried utility lines. Don't disrupt vital services.
TWO WORKING DAYS BEFORE YOU DIG

BENCH MARK
COUNTY OF RIVERSIDE BENCHMARK NO. "M-31"
COUNTY OF RIVERSIDE BENCHMARK 3-1/4" ALUMINUM DISK MARKED M-31, LOCATED FLUSH AT THE SOUTH WEST CORNER OF BRIDGE ON TOP OF SIDEWALK NEAR FACE OF CURB LOCATED AT THE CROSSING OF PERRIS BLVD. AND RIV. CO. FLOOD CONTROL CHANNEL (PERRIS LATERAL 'D') 43 FT. WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE BARRIER. (EDGE OF BRIDGE) MARKED PUNCH D.M.R. IN TOP OF CONC. POST FLUSH W/ GROUND.
ELEVATION = 1474.674' (NAVD 1929)

REF.	REVISIONS / DESCRIPTION	ENGINEER APPR.	DATE	RCFC/ APPR.	DATE
	SUPERSEDED BY SHEET 11A	H.L.A.	2/25/16	[illegible]	2/25/16

DESIGNED BY: BW
DRAWN BY: ET
DATE DRAWN:

APPROVED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173
HAIDOOK I. AGHAIAN Date: 11/18/14
RCE NO. 43293

REGISTERED PROFESSIONAL ENGINEER HAIDOOK I. AGHAIAN R.C.E. NO. 43293 Exp. 3-31-16 CIVIL STATE OF CALIFORNIA

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: [signature]
DATE: 1/20/2015
APPROVED BY: Mark A. Wills
DATE: 1/20/2015

CITY OF PERRIS
APPROVED BY: [signature] CITY ENGINEER DATE: 10-15-14
RECOMMENDED DATE:

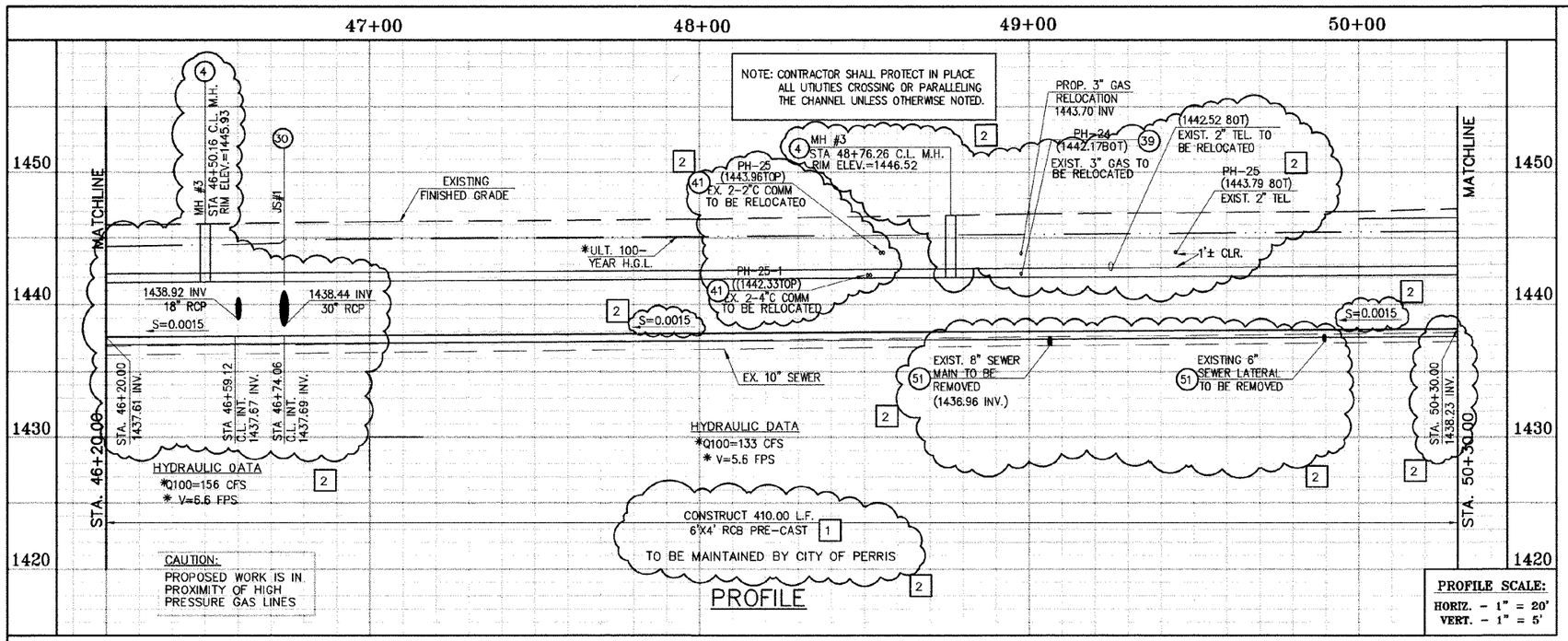
CITY OF PERRIS
FILE NO. P8-1013

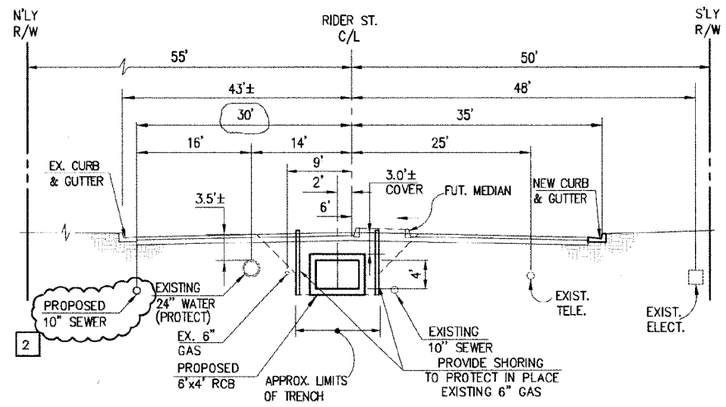
PERRIS VALLEY MDP LINE "A-B"

FROM STA. 46+20 TO STA. 50+30

PROJECT NO. 4-0-00537
DRAWING NO. 4-1063
SHEET NO. 11 OF 18

Last Update: 11/18/14
O:\2700-2799\2702\2702F\2702SD11.dwg





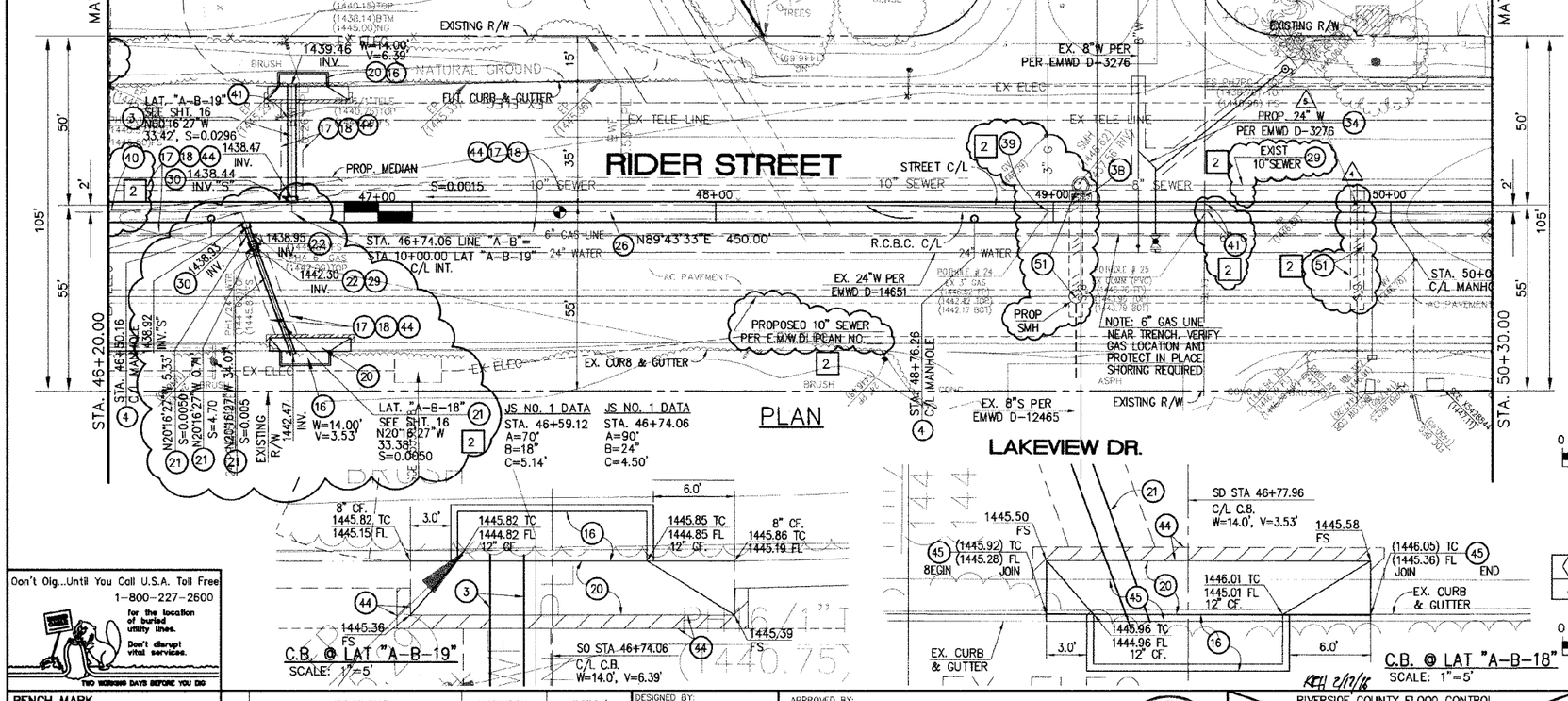
SECTION AT STA. 47+00.00
FROM STA 46+67.27 TO STA 47+76.81

SCALE: 1"=10'

✳ THE ULTIMATE H.G.L. IS BASED ON THE ADOPTED MDP WATER SURFACE ELEVATION OF 1433 IN THE PERRIS VALLEY STORM CHANNEL (PVSC) AT RIDER STREET, AND ASSUMES THAT FULL CHANNEL IMPROVEMENTS HAVE BEEN CONSTRUCTED PER THE ADOPTED MDP. FOR ALL WATER SURFACE ELEVATIONS BETWEEN 1433 AND THE 100-YEAR FLOOD ELEVATION FOR PVSC (1437.5), LINE "A-B" WILL NOT HAVE CAPACITY FOR LOCAL 100-YEAR FLOWS.

STORM DRAIN CONSTRUCTION NOTES:

(3) CONSTRUCT 30" R.C.P, D-LOAD PER PLAN.
(4) CONSTRUCT MANHOLE NO.3 PER R.C.F.C.&W.C.D. STD DWG. MH253
(16) CONSTRUCT CATCH BASIN NO.1 PER R.C.F.C.&W.C.D. STD. DWG. CB100
(17) SAWCUT AND REMOVE EXISTING A.C. PAVEMENT.
(18) UTILITY TRENCH AND SURFACE REPAIR PER CITY STANDARD ON SHT. NO. 18, MODIFIED TO ACCOMMODATE SLURRY BACKFILL WHERE BOX COVER IS LESS THAN 2.0'.
(20) CONSTRUCT LOCAL DEPRESSION NO. 2 CASE "B" PER R.C.F.C.&W.C.D. STD. DWG. LD201.
(21) CONSTRUCT 18" R.C.P, D-LOAD PER PLAN.
(22) CONSTRUCT CONCRETE COLLAR PER R.C.F.C.&W.C.D. STD DWG. M803.
[1] (26) CONSTRUCT 6' X 4' PRE-CAST RCB APWA STD PLAN 390-0 OR APPROVED EQUAL. SEE JOINT SEALANT NOTE ON SHEET #1.
(28) CONSTRUCT SEWER PROTECTION PER R.C.F.C.&W.C.D. STD. DWG. M807.
(29) PROTECT IN PLACE EXISTING UTILITY
(30) CONSTRUCT JUNCTION STRUCTURE NO.1 PER R.C.F.C.&W.C.D. STD. DWG. JS226.
(33) RELOCATE EXISTING SEWER LATERALS PER E.M.W.D. PLANS.
(34) RELOCATE EXISTING WATER LINE PER E.M.W.D. PLANS.
(36) INSTALL NEW SEWER LATERAL PER E.MW.D. PLANS.
(37) LOWER EXISTING SEWER MAIN PER E.M.W.D. PLANS.
(38) SLURRY BACKFILL BETWEEN RCB AND MANHOLE.
(39) RELOCATE EXISTING GAS LINE.
(41) RELOCATE EXISTING TELEPHONE LINE.
(44) SAWCUT, REMOVE AND REPLACE A.C. PAVEMENT SURFACE REPAIR PER CITY STD. ON SHEET 18. SEE SEPARATE PAVING PLANS.
(45) REMOVE EXISTING CONCRETE CURB AND GUTTER.
[2] (51) REMOVE EXISTING SEWER LATERALS PER E.M.W.D. PLANS.



SCALE: 1"=20'

SCALE: 1"=5'

	DELTA	RADIUS	TANGENT	LENGTH	P.I.
A	45°00'00"	45.00'	18.64'	35.34'	N 4982.531, E 6160.272

BENCH MARK
COUNTY OF RIVERSIDE BENCHMARK NO. "M-31"
COUNTY OF RIVERSIDE BENCHMARK - 3 1/4" ALUMINUM DISK MARKED M-31, LOCATED FLUSH AT THE SOUTH WEST CORNER OF BRIDGE ON TOP OF SIDEWALK NEAR FACE OF CURB LOCATED AT THE CROSSING OF PERRIS BLVD. AND RIV. CO. FLOOD CONTROL CHANNEL (PERRIS LATERAL "A"), 43 FT. WEST OF CENTERLINE OF PERRIS BLVD. AND 4.3 FT. EAST OF CONCRETE BRIDGE BARRIER. (EDGE OF BRIDGE) MARKED R-102 D.M.R. IN TOP OF CONC. POST FLUSH W/ GROUND
ELEVATION = 1474.874' (NAVD 1929)

REF.	REVISIONS	ENGINEER APPR.	ENGINEER DATE	RCFC/ APPR.	RCFC/ DATE
2	CHANGED SLOPE TO 0.0015, ADDED MH, ADDED NEW 10"S, CHANGED 42" LAT TO 24" LAT. ADDED EX. UTILITIES, RELOCATE UTILITIES, REVISED SD	H.L.A.	2/29/16	[illegible]	4/21/16
1	CHANGED CAST IN PLACE RCB TO PRE-CAST RCB PER APWA 390-0	H.L.A.	2/29/16	[illegible]	4/21/16

DESIGNED BY:
DRAWN BY:
DATE DRAWN:

APPROVED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173
HAIDOOK I. AGHAIAN Date: 2/10/16
HAIDOOK I. AGHAIAN RCE NO. 43293

REGISTERED PROFESSIONAL ENGINEER HAIDOOK I. AGHAIAN R.C.E. NO. 43293 Exp. 3-31-16 CIVIL STATE OF CALIFORNIA

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

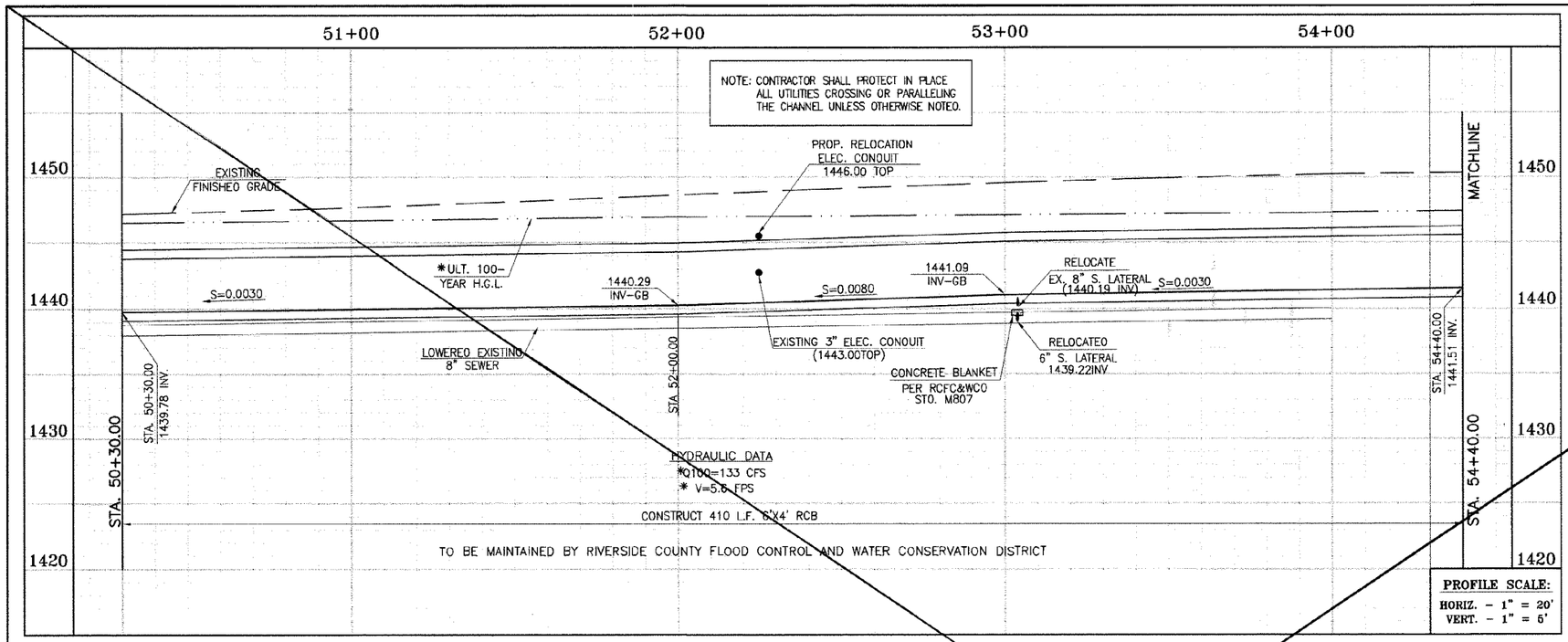
CITY OF PERRIS
APPROVED BY:
CITY ENGINEER DATE: 2-9-16
RECOMMENDED DATE:

CITY OF PERRIS
FILE NO. P8-1013

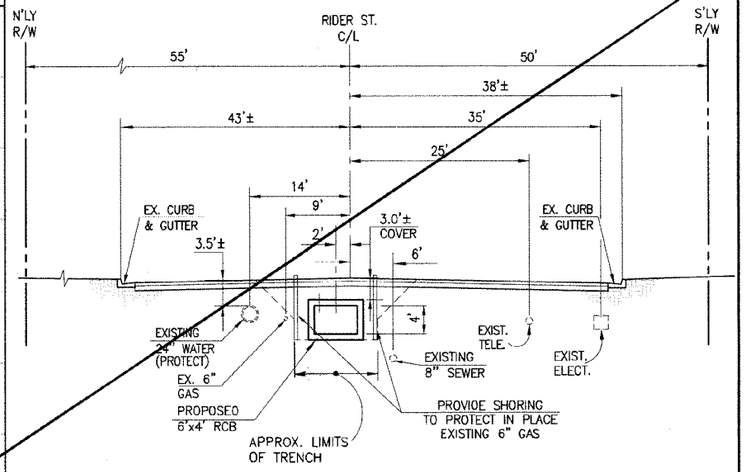
PERRIS VALLEY MDP
LINE "A-B"
FROM STA. 46+20 TO STA. 50+30

PROJECT NO. 4-0-00537
DRAWING NO. 4-1063
SHEET NO. 11A OF 18

Last Update: 1/15/16
O:\2700-2799\2702\2702F\2702SD11.dwg



PROFILE SCALE:
HORIZ. - 1" = 20'
VERT. - 1" = 5'



SECTION AT STA. 51+00.00

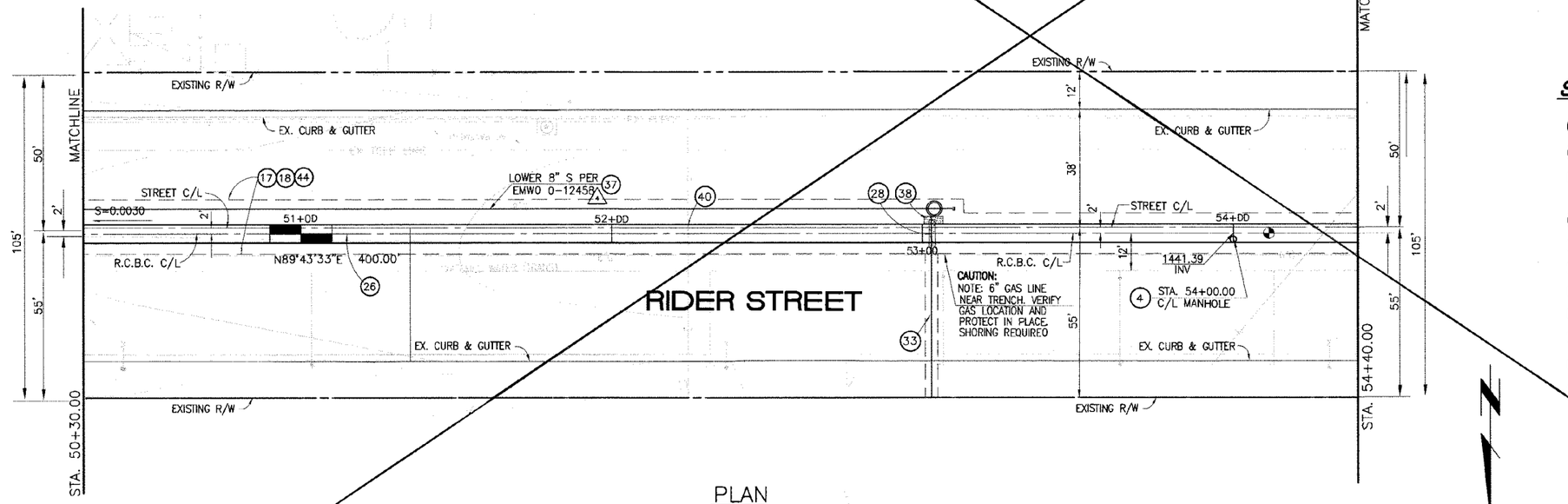
FROM STA 50+30.00 TO STA 54+40.00

0 5 10 20

SCALE:1"=10'

✳ THE ULTIMATE H.G.L. IS BASED ON THE ADOPTED MDP WATER SURFACE ELEVATION OF 1433 IN THE PERRIS VALLEY STORM CHANNEL (PVSC) AT RIDER STREET, AND ASSUMES THAT FULL CHANNEL IMPROVEMENTS HAVE BEEN CONSTRUCTED PER THE ADOPTED MDP. FOR ALL WATER SURFACE ELEVATIONS BETWEEN 1433 AND THE 100-YEAR FLOOD ELEVATION FOR PVSC (1437.5), LINE "A-B" WILL NOT HAVE CAPACITY FOR LOCAL 100-YEAR FLOWS.

CAUTION:
PROPOSED WORK IS IN PROXIMITY OF HIGH PRESSURE GAS LINES



PLAN

0 10 20 40

SCALE:1"=20'

STORM DRAIN CONSTRUCTION NOTES:

(4) CONSTRUCT MANHOLE NO. 3 PER R.C.F.C.&W.C.D. STD OWG. MH253
(17) SAWCUT AND REMOVE EXISTING A.C. PAVEMENT.
(18) UTILITY TRENCH AND SURFACE REPAIR PER CITY STANDARD ON SHT. NO. 18, MODIFIED TO ACCOMMODATE SLURRY BACKFILL WHERE BOX COVER IS LESS THAN 2.0'.
(26) CONSTRUCT 6' X 4' RCB PER CALTRANS STD. PLAN NO. 080 OR APPROVED EQUAL.
(28) CONSTRUCT SEWER PROTECTION PER R.C.F.C.&W.C.D. STD. OWG. M807.
(33) RELOCATE EXISTING 6" SEWER LATERAL PER E.M.W.D. PLANS.
(37) LOWER EXISTING 8" SEWER MAIN PER E.M.W.D. PLANS.
(38) SLURRY BACKFILL BETWEEN RCB AND MANHOLE.
(39) RELOCATE EXISTING GAS LINE.
(40) RELOCATE EXISTING ELECTRICAL LINE.
(44) SAWCUT, REMOVE AND REPLACE A.C. PAVEMENT SURFACE REPAIR PER CITY STD. ON SHEET 18. SEE SEPARATE PAVING PLANS.

KEH 4/10/14

BENCH MARK	REVISIONS	ENGINEER		RCFC/		DESIGNED BY: BW
COUNTY OF RIVERSIDE BENCHMARK NO. "M-31" COUNTY OF RIVERSIDE BENCHMARK - 3 1/4" ALUMINUM DISK MARKED M-31, LOCATED FLUSH @ THE SOUTH WEST CORNER OF BRIDGE ON TOP OF SIDEWALK NEAR FACE OF CURB LOCATED AT THE CROSSING OF PERRIS BLVD. AND RIV. CO. FLOOD CONTROL CHANNEL (PERRIS LATERAL 'B'), 43 FT. WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE BARRIER. (EDGE OF BRIDGE) MARKED B-M31 D.R.R. IN TOP OF CONC. POST FLUSH W/ GROUND. ELEVATION = 1474.674' (NAVD 1929)	SUPERSEDED BY SHEET 12A	H.I.A.	2/26/16	CK	2/27/16	DRAWN BY: ET
						DATE DRAWN:
	REF. DESCRIPTION	APPR.	DATE	APPR.	DATE	

APPROVED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173
HAIDOOK I. AGHAIAN Date: 11/18/14
RCE NO. 43293

REGISTERED PROFESSIONAL ENGINEER HAIDOOK I. AGHAIAN R.C.E. NO. 43293 Exp. 3-31-16 CIVIL STATE OF CALIFORNIA

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 1/20/2015
APPROVED BY: Mark A. Wills DATE: 1/20/2015

CITY OF PERRIS
APPROVED BY: CITY ENGINEER DATE: 12-15-14
RECOMMENDED DATE:

PERRIS VALLEY MDP LINE "A-B"

FROM STA. 50+30 TO STA. 54+40

CITY OF PERRIS
FILE NO. P8-1013
PROJECT NO. 4-0-00537
DRAWING NO. 4-1063
SHEET NO. 12 OF 18

Last Update: 11/18/14
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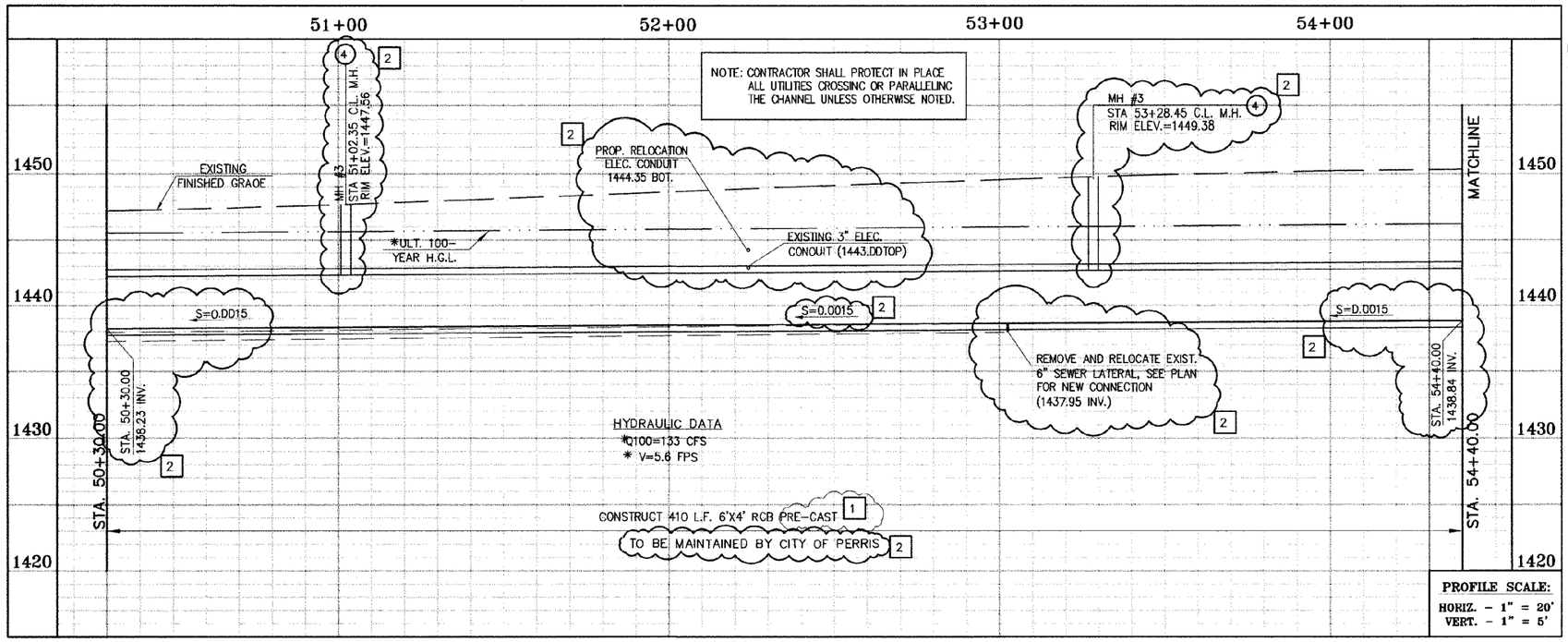
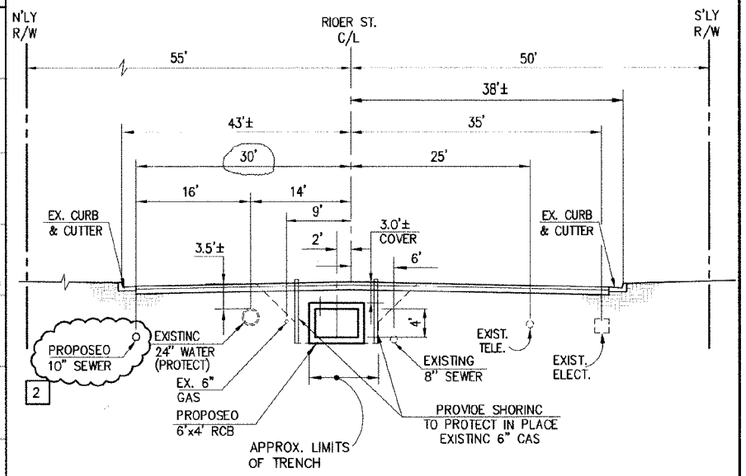




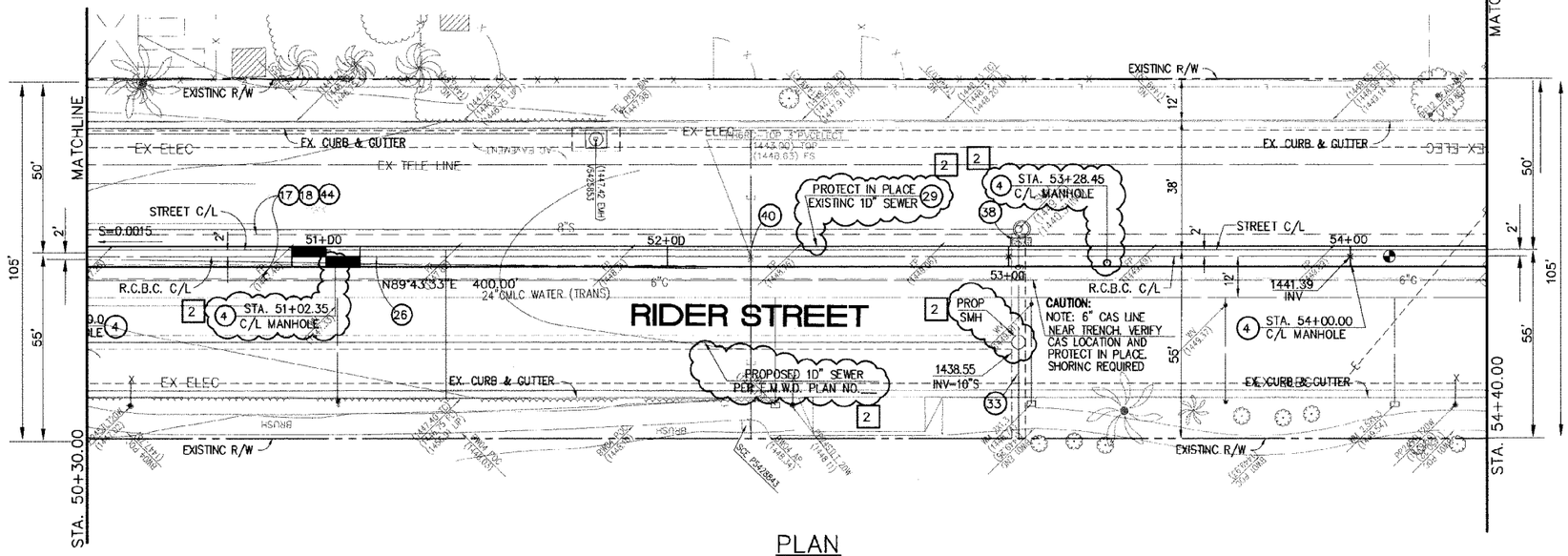
SECTION AT STA. 51+00.00

FROM STA 50+30.00 TO STA 54+40.00

0 5 10 20

SCALE: 1"=10'

CAUTION:
PROPOSED WORK IS IN PROXIMITY OF HIGH PRESSURE GAS LINES



PLAN

0 10 20 40

SCALE: 1"=20'

STORM DRAIN CONSTRUCTION NOTES:

(4) CONSTRUCT MANHOLE NO. 3 PER R.C.F.C.&W.C.O. STD DWC. MH253

(17) SAWCUT ANO REMOVE EXISTING A.C. PAVEMENT.

(18) UTILITY TRENCH AND SURFACE REPAIR PER CITY STANDARD ON SHT. NO. 18, MOOIFIEO TO ACCOMMOOATE SLURRY BACKFILL WHERE BOX COVER IS LESS THAN 2.0'.

[1] (26) CONSTRUCT 6' X 4' PRE-CAST RCB APWA STD PLAN 390-0 OR APPROVEO EQUAL. SEE JOINT SEALANT NOTE ON SHEET #1.

(28) CONSTRUCT SEWER PROTECTION PER R.C.F.C.&W.C.O. STD. OWG. M807.

(29) PROTECT IN PLACE EXISTINC UTILITY

(33) RELOCATE EXISTING 6" SEWER LATERAL PER E.M.W.O. PLANS.

(38) SLURRY BACKFILL BETWEEN RCB ANO MANHOLE.

(39) RELOCATE EXISTINC CAS LINE.

(40) RELOCATE EXISTINC ELECTRICAL LINE.

(44) SAWCUT, REMOVE AND REPLACE A.C. PAVEMENT SURFACE REPAIR PER CITY STD. ON SHEET 18. SEE SEPARATE PAVINC PLANS.

✳ THE ULTIMATE H.G.L. IS BASED ON THE AOOPTEO MOP WATER SURFACE ELEVATION OF 1433 IN THE PERRIS VALLEY STORM CHANNEL (PVSC) AT RIOER STREET, AND ASSUMES THAT FULL CHANNEL IMPROVEMENTS HAVE BEEN CONSTRUCTEO PER THE AOOPTED MOP. FOR ALL WATER SURFACE ELEVATIONS BETWEEN 1433 ANO THE 100-YEAR FLOOO ELEVATION FOR PVSC (1437.5), LINE "A-B" WILL NOT HAVE CAPACITY FOR LOCAL 100-YEAR FLOWS.

Don't Dig...Until You Call U.S.A. Toll Free 1-800-227-2600 for the location of buried utility lines. Don't disrupt vital services. TWO WORKING DAYS BEFORE YOU DIG

BENCH MARK

COUNTY OF RIVERSIDE BENCHMARK NO. "H-31"
COUNTY OF RIVERSIDE BENCHMARK - 3 1/4" ALUMINUM DISK MARKED H-31, LOCATED FLUSH AT THE SOUTH WEST CORNER OF BRIDGE ON TOP OF SIDEWALK NEAR FACE OF CURB LOCATED AT THE CROSSING OF PERRIS BLVD. AND RIV. CO. FLOOD CONTROL CHANNEL (PERRIS LATERAL "A"). 43 FT. WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE BARRIER. (EDGE OF BRIDGE) MARKED R-102 D.B.E. IN TOP OF CONC. POST FLUSH W/ GROUND
ELEVATION = 1474.674' (NAVD 1929)

REF.	REVISIONS	ENGINEER APPR.	ENGINEER DATE	RCFC/ APPR.	RCFC/ DATE
2	CHANGED SLOPE TO 0.0015, ADDED MH, ADDED NEW 10"S, CHANGED 42" LAT TO 24" LAT ADDED EX. UTILITIES, RELOCATE UTILITIES, REVISED SD	H.I.A	2/29/16	0/6	2/2/16
1	CHANGED CAST IN PLACE RCB TO PRE-CAST RCB PER APWA 390-0	H.I.A	2/25/16	0/6	2/2/16

DESIGNED BY:
DRAWN BY:
DATE DRAWN:

APPROVED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173
Haidook K. Aghaian Date: 2/1/16
HAIDOOK I. AGHAIAN RCE NO. 43293

REGISTERED PROFESSIONAL ENGINEER HAIDOOK I. AGHAIAN R.C.E. NO. 43293 Exp. 3-31-16 CIVIL STATE OF CALIFORNIA

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

CITY OF PERRIS
APPROVED BY:
CITY ENGINEER DATE: 2-3-16
RECOMMENDED DATE:

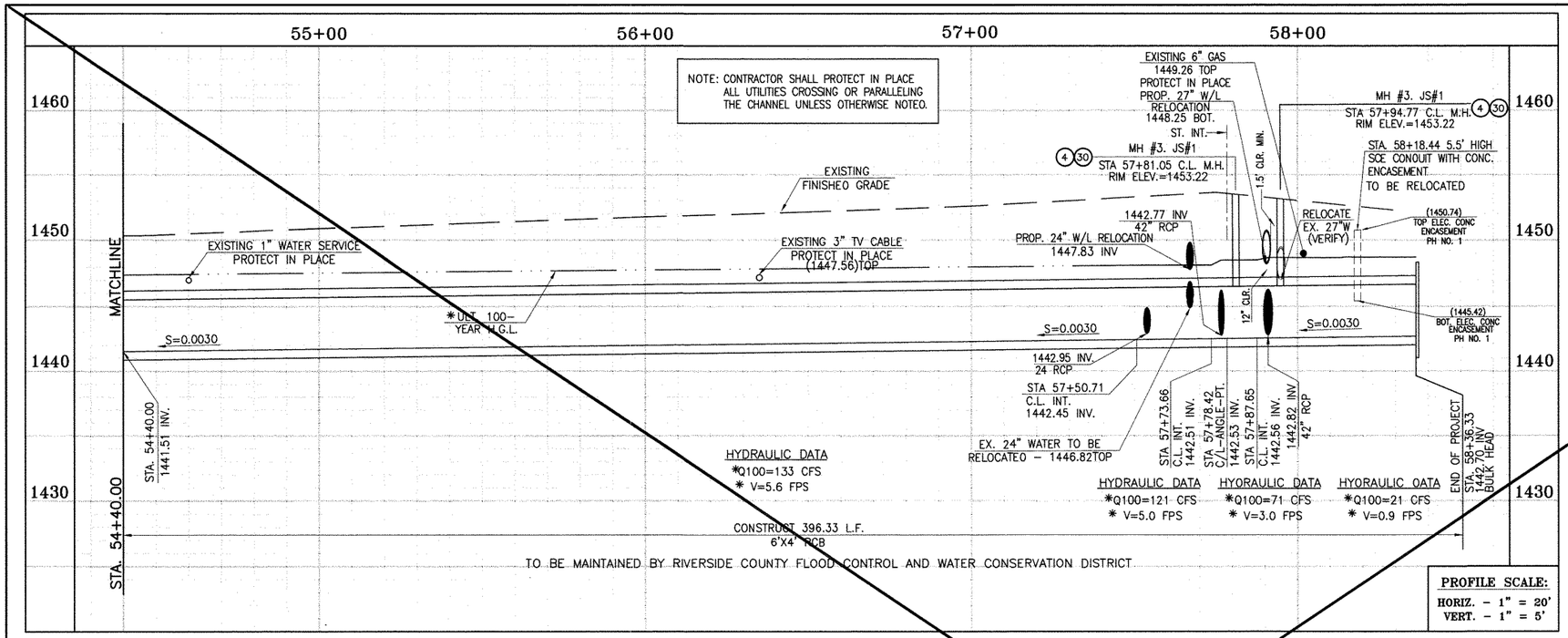
CITY OF PERRIS FILE NO. P8-1013

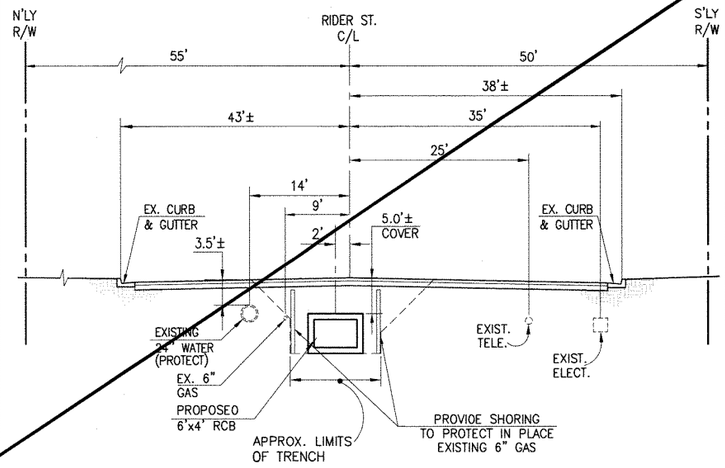
PERRIS VALLEY MDP LINE "A-B"

FROM STA. 50+30 TO STA. 54+40

PROJECT NO. 4-0-00537
DRAWING NO. 4-1063
SHEET NO. 12A OF 18

Last Update: 1/29/16
O:\2700-2799\2702\2702F\2702SD12.dwg





SECTION AT STA. 55+00.00

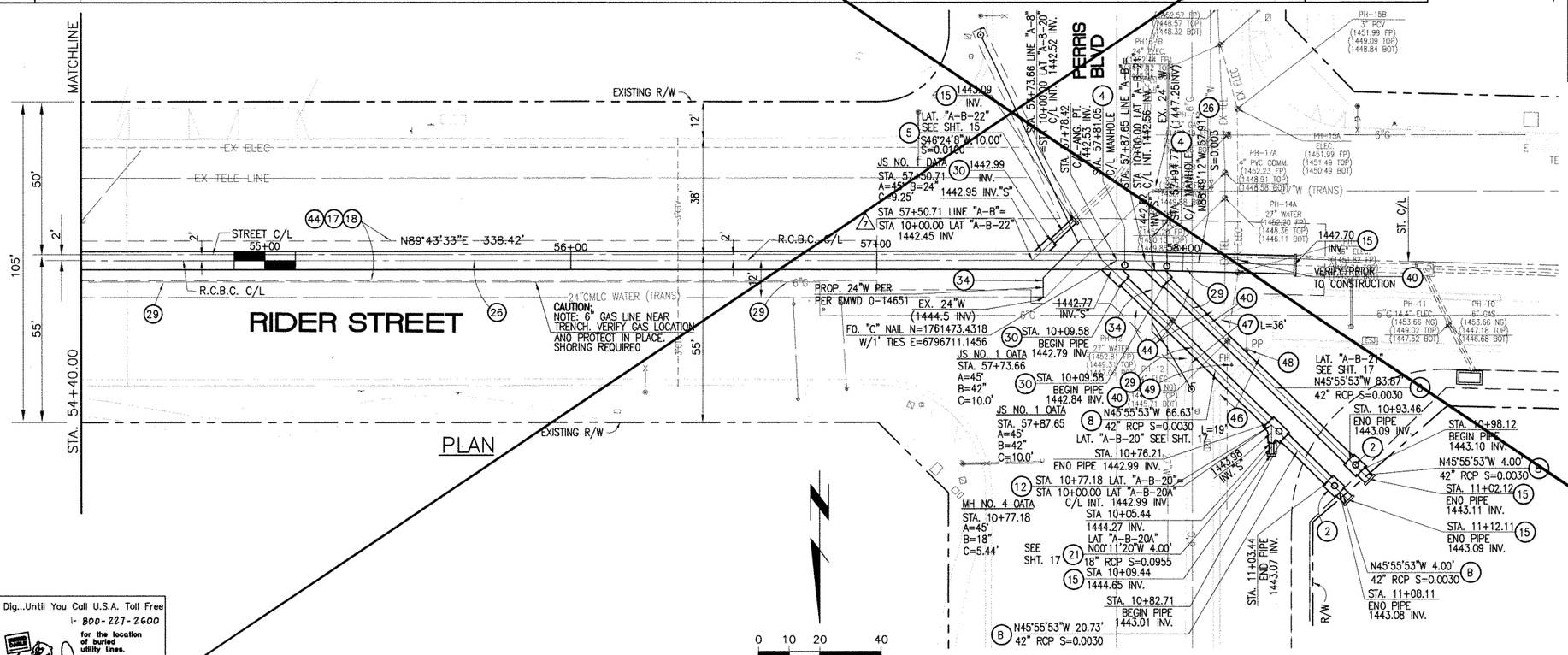
FROM STA 54+40.00 TO STA 58+36.36

0 5 10 20

SCALE:1"=10'

CAUTION: PROPOSED WORK IS IN PROXIMITY OF HIGH PRESSURE GAS LINES

✳ THE ULTIMATE H.G.L. IS BASED ON THE ADOPTED MDP WATER SURFACE ELEVATION OF 1433 IN THE PERRIS VALLEY STORM CHANNEL (PVSC) AT RIDER STREET, AND ASSUMES THAT FULL CHANNEL IMPROVEMENTS HAVE BEEN CONSTRUCTED PER THE ADOPTED MDP. FOR ALL WATER SURFACE ELEVATIONS BETWEEN 1433 AND THE 100-YEAR FLOOD ELEVATION FOR PVSC (1437.5), LINE "A-B" WILL NOT HAVE CAPACITY FOR LOCAL 100-YEAR FLOWS.



STORM DRAIN CONSTRUCTION NOTES:

(2) CONSTRUCT MANHOLE #2 PER R.C.F.C.&W.C.O. STO OWG. MH252
(4) CONSTRUCT MANHOLE #3 PER R.C.F.C.&W.C.D. STO DWG. MH253
(5) CONSTRUCT 24" R.C.P, O-LOAD PER PLAN.
(B) CONSTRUCT 42" R.C.P, O-LOAO PER PLAN.
(12) CONSTRUCT MANHOLE #4 PER R.C.F.C.&W.C.O. STO OWG. MH254
(15) CONSTRUCT CONCRETE BULKHEAO PER R.C.F.C.&W.C.O. STO OWG. M816.
(17) SAWCUT ANO REMOVE EXISTING A.C. PAVEMENT.
(18) UTILITY TRENCH ANO SURFACE REPAIR PER CITY STANOARO ON SHT. NO. 1B, MOOIFIEO TO ACCOMMOOATE SLURRY BACKFILL WHERE BOX COVER IS LESS THAN 2.0'.
(21) CONSTRUCT 18" R.C.P, O-LOAD PER PLAN.
(26) CONSTRUCT 6' X 4' RCB PER CALTRANS STO. PLAN NO. OBO OR APPROVED EQUAL.
(29) PROTECT IN PLACE EXISTING UTILITIES.
(30) CONSTRUCT JUNCTION STRUCTURE NO. 1 PER R.C.F.C.&W.C.O. STO. OWG. JS226.
(34) RELOCATE EXISTING WATER LINE PER E.M.W.O. PLANS.
(40) RELOCATE EXISTING ELECTRICAL LINE.
(44) SAWCUT, REMOVE ANO REPLACE A.C. PAVEMENT SURFACE REPAIR PER CITY STD. ON SHEET 18.
(46) SAWCUT, REMOVE ANO REPLACE EXISTING 2'± WIOE CONCRETE GUTTER, LENGTH PER PLAN.
(47) SAWCUT, REMOVE ANO REPLACE EXISTING CONCRETE CURB & GUTTER, LENGTH PER PLAN. SEE SEPARATE PAVING PLANS.
(48) EXISTING POWER POLE TO BE RELOCATED BY OTHERS.
(49) EXISTING FIRE HYORANT TO BE RELOCATED BY OTHERS.

Don't Dig...Until You Call U.S.A. Toll Free 1-800-227-2600 for the location of buried utility lines. Don't disrupt vital services.
TWO WORKING DAYS BEFORE YOU DIG

KFH 4/16/14

BENCH MARK
COUNTY OF RIVERSIDE BENCHMARK NO. "M-31"
COUNTY OF RIVERSIDE BENCHMARK - 3 1/4" ALUMINUM DISK MARKED M-31, LOCATED FLUSH AT THE SOUTH WEST CORNER OF BRIDGE ON TOP OF SIDEWALK NEAR FACE OF CURB LOCATED AT THE CROSSING OF PERRIS BLVD. AND RR. CO. FLOOD CONTROL CHANNEL (PERRIS LATERAL "A"), 43 FT. WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE BARRIER. (EDGE OF BRIDGE) MARKED BY 102 D.N.R. IN TOP OF CONC. POST FLUSH W/ GROUND
ELEVATION = 1474.674' (NAVD 1929)

REF.	REVISIONS	APPR.	DATE	APPR.	DATE
	SUPERSEDED BY SHEET 13A	H.H.	2/25/16	CJG	3/21/16

ENGINEER: RCFC/
DESIGNED BY: BW
DRAWN BY: ET
DATE DRAWN:

APPROVED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173
Hadook I. Aghaian Date: 11/18/14
HAIOOOK I. AGHAIAN RCE NO. 43293

REGISTERED PROFESSIONAL ENGINEER HAIOOOK I. AGHAIAN R.C.E. NO. 43293 Exp. 3-31-16 CIVIL STATE OF CALIFORNIA

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 1/20/2015
APPROVED BY: DATE: 1/20/2015

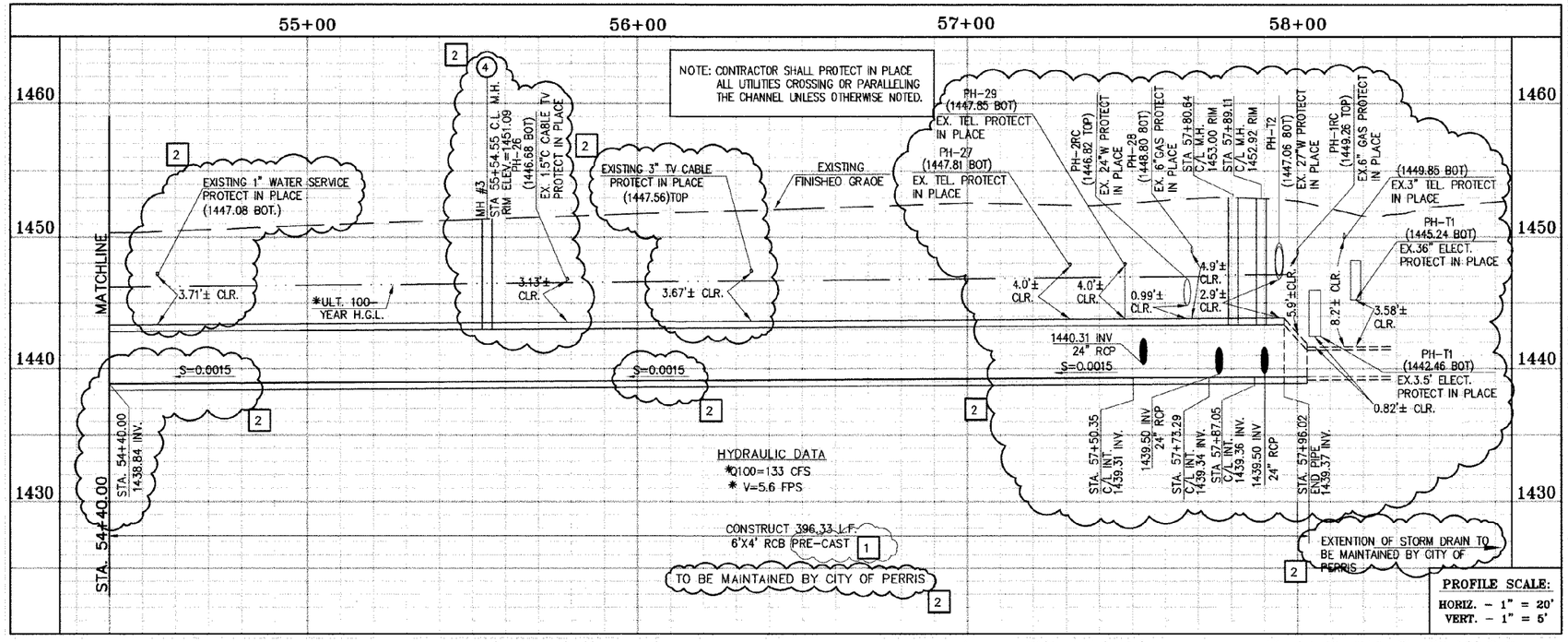
CITY OF PERRIS
APPROVED BY:
CITY ENGINEER DATE: 12-15-14
RECOMMENDED DATE:

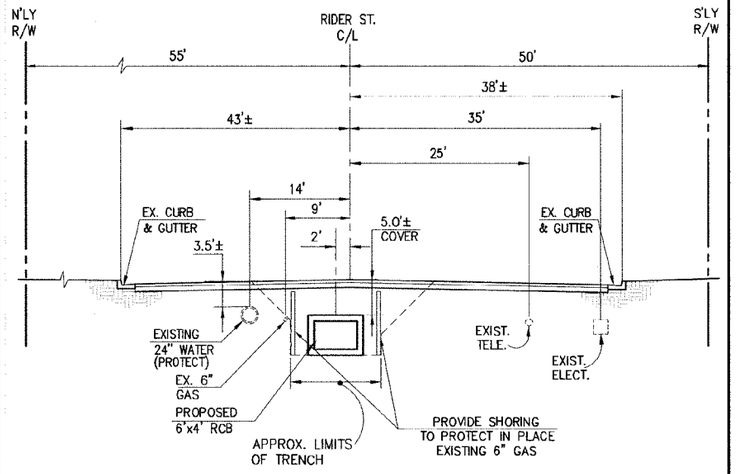
PERRIS VALLEY MDP LINE "A-B"

FROM STA. 54+40 TO STA. 58+36

CITY OF PERRIS FILE NO. P8-1013
PROJECT NO. 4-0-00537
DRAWING NO. 4-1063
SHEET NO. 13 OF 18

Last Update: 11/18/14
O:\2700-2799\2702\2702F\2702SD13.dwg





SECTION AT STA. 55+00.00

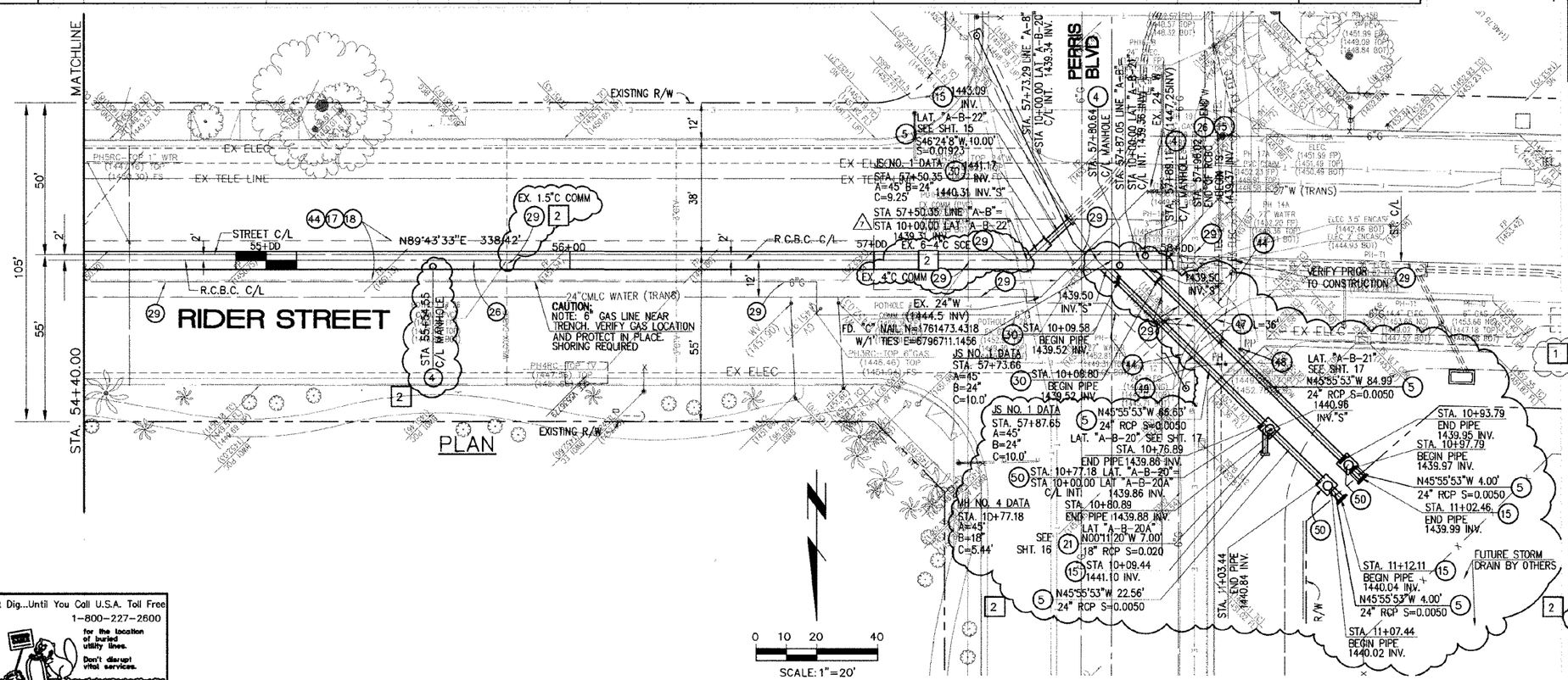
FROM STA 54+40.00 TO STA 58+36.36

0 5 10 20

SCALE: 1"=10'

CAUTION:
PROPOSED WORK IS IN PROXIMITY OF HIGH PRESSURE GAS LINES

* THE ULTIMATE H.G.L. IS BASED ON THE ADOPTED MDP WATER SURFACE ELEVATION OF 1433 IN THE PERRIS VALLEY STORM CHANNEL (PVSC) AT RIDER STREET, AND ASSUMES THAT FULL CHANNEL IMPROVEMENTS HAVE BEEN CONSTRUCTED PER THE ADOPTED MDP. FOR ALL WATER SURFACE ELEVATIONS BETWEEN 1433 AND THE 100-YEAR FLOOD ELEVATION FOR PVSC (1437.5), LINE "A-B" WILL NOT HAVE CAPACITY FOR LOCAL 100-YEAR FLOWS.



STORM DRAIN CONSTRUCTION NOTES:

4. CONSTRUCT MANHOLE #3 PER R.C.F.C.&W.C.D. STD DWG. MH253
5. CONSTRUCT 24" R.C.P., D-LOAD PER PLAN.
8. CONSTRUCT 42" R.C.P., D-LOAD PER PLAN.
12. CONSTRUCT MANHOLE #4 PER R.C.F.C.&W.C.O. STD DWG. MH254
15. CONSTRUCT CONCRETE BULKHEAD PER R.C.F.C.&W.C.D. STD DWG. M816.
17. SAWCUT AND REMOVE EXISTING A.C. PAVEMENT.
18. UTILITY TRENCH AND SURFACE REPAIR PER CITY STANDARD ON SHT. NO. 18, MODIFIED TO ACCOMMODATE SLURRY BACKFILL WHERE BOX COVER IS LESS THAN 2.0'.
21. CONSTRUCT 18" R.C.P., D-LOAD PER PLAN.
1 26. CONSTRUCT 6' X 4' PRE-CAST RCB APWA STD PLAN 390-0 OR APPROVED EQUAL. SEE JOINT SEALANT NOTE ON SHEET #1.
29. PROTECT IN PLACE EXISTING UTILITIES.
30. CONSTRUCT JUNCTION STRUCTURE NO. 1 PER R.C.F.C.&W.C.D. STD. DWG. JS226.
34. RELOCATE EXISTING WATER LINE PER E.M.W.D. PLANS.
40. RELOCATE EXISTING ELECTRICAL LINE.
44. SAWCUT, REMOVE AND REPLACE A.C. PAVEMENT SURFACE REPAIR PER CITY STD. ON SHEET 18.
46. SAWCUT, REMOVE AND REPLACE EXISTING 2'± WIDE CONCRETE GUTTER, LENGTH PER PLAN.
47. SAWCUT, REMOVE AND REPLACE EXISTING CONCRETE CURB & GUTTER, LENGTH PER PLAN. SEE SEPARATE PAVING PLANS.
48. EXISTING POWER POLE TO BE RELOCATED BY OTHERS.
49. EXISTING FIRE HYDRANT TO BE RELOCATED BY OTHERS.
50. CONSTRUCT MANHOLE #1 PER R.C.F.C.&W.C.D. STD DWG. MH251

Don't Dig...Until You Call U.S.A. Toll Free 1-800-227-2600 for the location of buried utility lines. Don't disrupt vital services.
TWO WORKING DAYS BEFORE YOU DIG

BENCH MARK
COUNTY OF RIVERSIDE BENCHMARK NO. "M-31"
COUNTY OF RIVERSIDE BENCHMARK - 3 1/4" ALUMINUM DISK MARKED M-31, LOCATED FLUSH AT THE SOUTH WEST CORNER OF BRIDGE ON TOP OF SIDEWALK NEAR FACE OF CURB LOCATED AT THE CROSSING OF PERRIS BLVD. AND RIV. CO. FLOOD CONTROL CHANNEL (PERRIS LATERAL "A") 43 FT. WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE BARRIER. (EDGE OF BRIDGE) MARKED R-102 D.M.R. IN TOP OF CONC. POST FLUSH W/ GROUND
ELEVATION = 1474.674' (NAVD 1929)

REF.	DESCRIPTION	ENGINEER APPR.	ENGINEER DATE	RCFC/ APPR.	RCFC/ DATE
2	CHANGED SLOPE TO 0.0015, ADDED MH, ADDED NEW 10'S, CHANGED 42" LAT TO 24" LAT. ADDED EX. UTILITIES, RELOCATE UTILITIES, REVISED SD	H.L.A.	2/29/16	CK'D	3/17/16
1	CHANGED CAST IN PLACE RCB TO PRE-CAST RCB PER APWA 390-0	H.L.A.	2/29/16	CK'D	3/17/16

DESIGNED BY:
DRAWN BY:
DATE DRAWN:

APPROVED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173
Haidook K. Aghaian Date: 2/11/16
HAIDOOK I. AGHAIAN RCE NO. 43293

REGISTERED PROFESSIONAL ENGINEER HAIDOOK I. AGHAIAN R.C.E. NO. 43293 Exp. 3-31-16 CIVIL STATE OF CALIFORNIA

KH 2/17/16

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

CITY OF PERRIS
APPROVED BY:
CITY ENGINEER DATE: 2-9-16
RECOMMENDED DATE:

CITY OF PERRIS
FILE NO. P8-1013

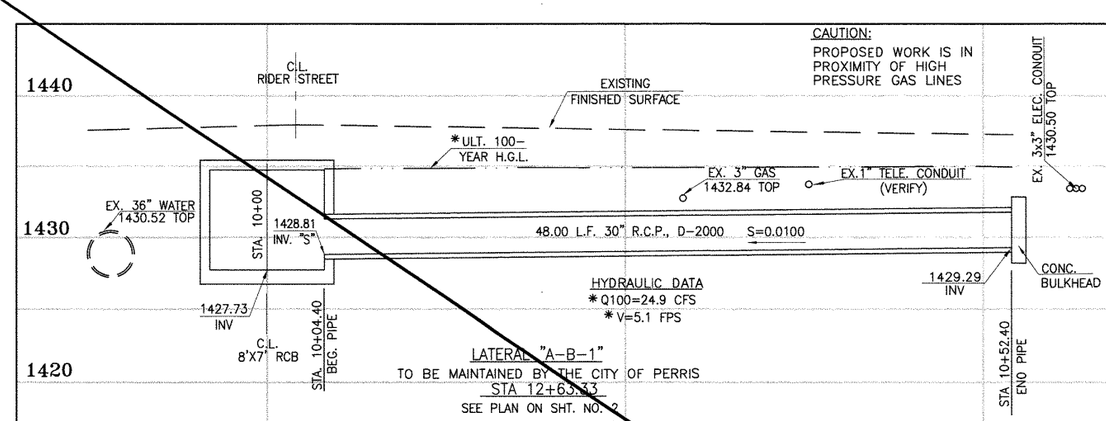
PERRIS VALLEY MDP LINE "A-B"

FROM STA. 54+40 TO STA. 58+36

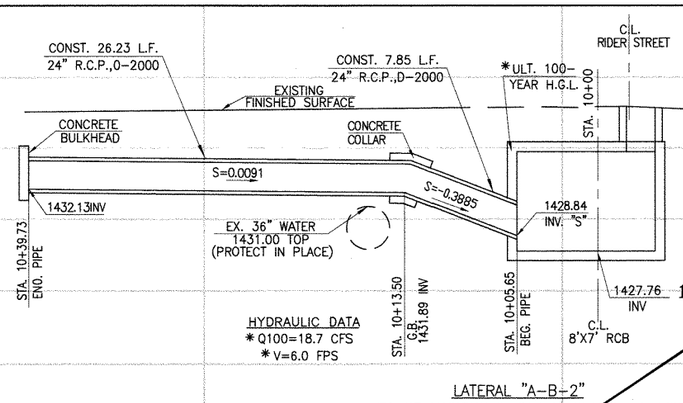
PROJECT NO. 4-0-00537
DRAWING NO. 4-1063
SHEET NO. 13A OF 18

Last Update: 1/29/16
O:\2700-2799\2702\2702F\2702SD13.dwg

CAUTION:
PROPOSED WORK IS IN PROXIMITY OF HIGH PRESSURE GAS LINES

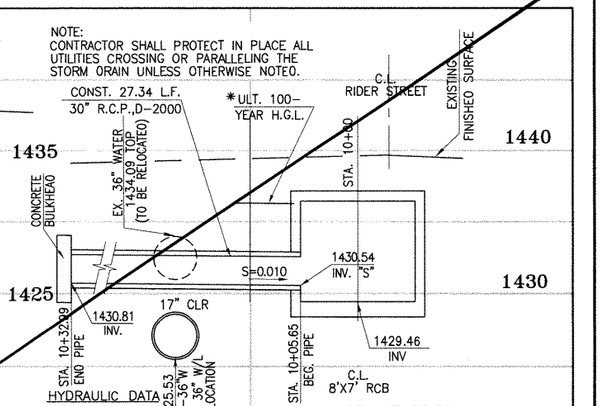


LATERAL "A-B-1"
TO BE MAINTAINED BY THE CITY OF PERRIS
STA 12+63.33
SEE PLAN ON SHT. NO. 2



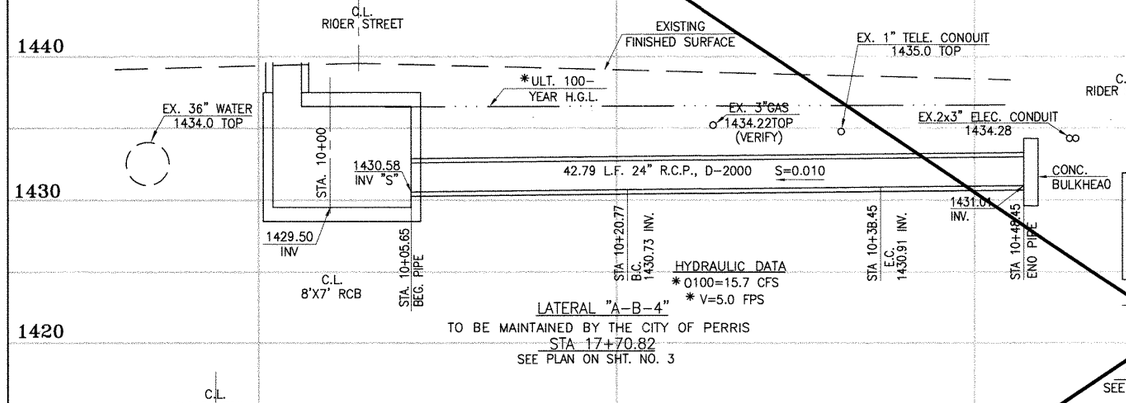
LATERAL "A-B-2"
TO BE MAINTAINED BY THE CITY OF PERRIS
STA 12+75.33
SEE PLAN ON SHT. NO. 2

NOTE:
CONTRACTOR SHALL PROTECT IN PLACE ALL UTILITIES CROSSING OR PARALLELING THE STORM DRAIN UNLESS OTHERWISE NOTED.

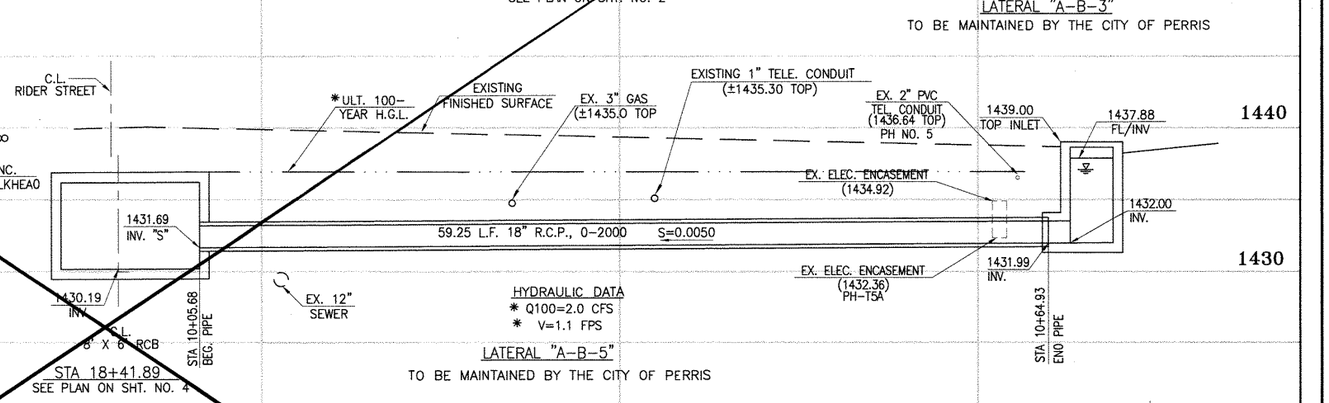


STA 17+58.82
SEE PLAN ON SHT. NO. 3

LATERAL "A-B-3"
TO BE MAINTAINED BY THE CITY OF PERRIS

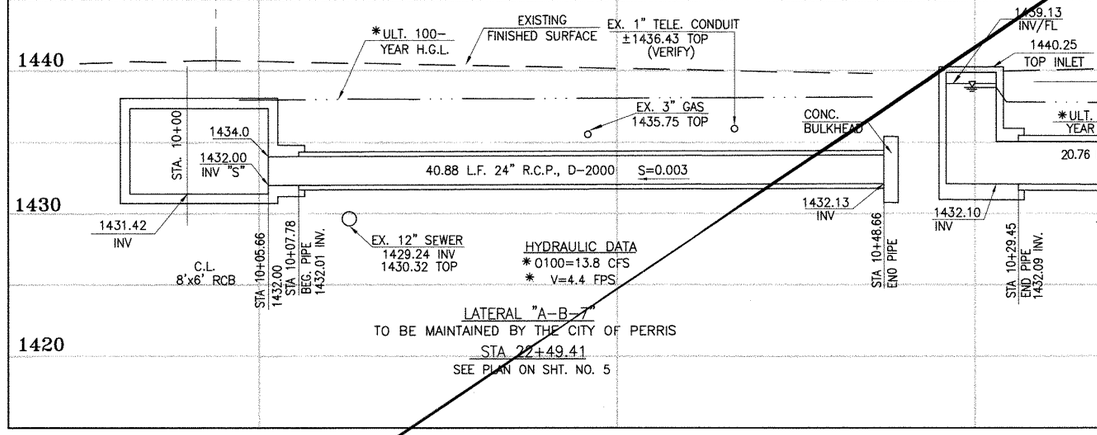


LATERAL "A-B-4"
TO BE MAINTAINED BY THE CITY OF PERRIS
STA 17+70.82
SEE PLAN ON SHT. NO. 3

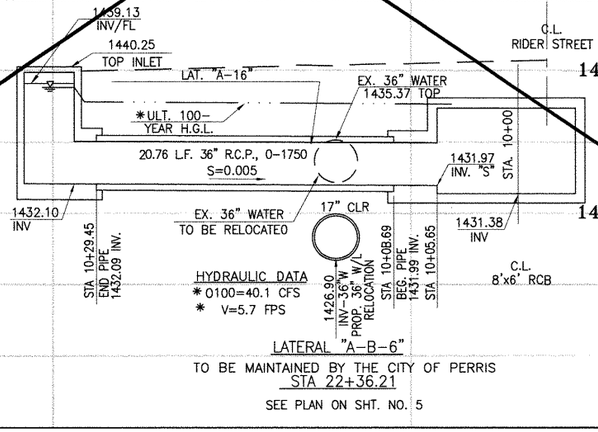


STA 18+41.89
SEE PLAN ON SHT. NO. 4

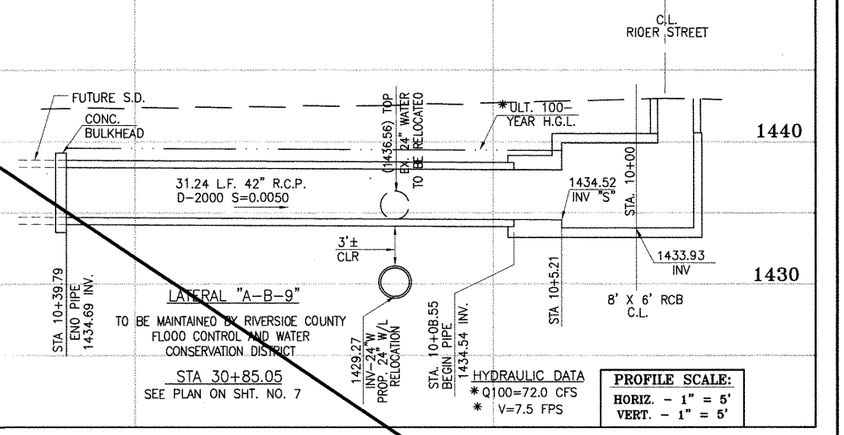
LATERAL "A-B-5"
TO BE MAINTAINED BY THE CITY OF PERRIS



LATERAL "A-B-7"
TO BE MAINTAINED BY THE CITY OF PERRIS
STA 22+49.41
SEE PLAN ON SHT. NO. 5



LATERAL "A-B-6"
TO BE MAINTAINED BY THE CITY OF PERRIS
STA 22+36.21
SEE PLAN ON SHT. NO. 5



LATERAL "A-B-9"
TO BE MAINTAINED BY RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
STA 30+85.05
SEE PLAN ON SHT. NO. 7

PROFILE SCALE:
HORIZ. - 1" = 5'
VERT. - 1" = 5'

CAUTION:
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1-800-227-2600
for the location of buried utility lines.
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* THE ULTIMATE H.G.L. IS BASED ON THE ADOPTED MDP WATER SURFACE ELEVATION OF 1433 IN THE PERRIS VALLEY STORM CHANNEL (PVSC) AT RIDER STREET, AND ASSUMES THAT FULL CHANNEL IMPROVEMENTS HAVE BEEN CONSTRUCTED PER THE ADOPTED MDP. FOR ALL WATER SURFACE ELEVATIONS BETWEEN 1433 AND THE 100-YEAR FLOOD ELEVATION FOR PVSC (1437.5), LINE "A-B" WILL NOT HAVE CAPACITY FOR LOCAL 100-YEAR FLOWS.

BENCH MARK
COUNTY OF RIVERSIDE BENCHMARK NO. 24-31
COUNTY OF RIVERSIDE BENCHMARK - 3 1/4" ALUMINUM DISK MARKED 4-31, LOCATED FLUSH AT THE SOUTH WEST CORNER OF BRIDGE ON TOP OF SIDEWALK NEAR FACE OF CURB LOCATED AT THE CROSSING OF PERRIS BLVD. AND RIV. CO. FLOOD CONTROL CHANNEL (PERRIS LATERAL "A"), 43 FT. WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE BARRIER (EDGE OF BRIDGE) MARKED B 102 D.M.R. IN TOP OF CONC. POST FLUSH W/ GROUND
ELEVATION = 1474.674' (NAVD 1929)

REF.	DESCRIPTION	APPR.	DATE	APPR.	DATE
	REVISIONS	ENGINEER		RCFC/	
	SUPERSEDED BY SHEET 14A	H.A.	2/25/16	DK	2/25/16

DESIGNED BY: BW
DRAWN BY: ET
DATE DRAWN:

APPROVED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173
HAIDOOK I. AGHAIAN Date: 11/18/14 RCE NO. 43293

REGISTERED PROFESSIONAL ENGINEER HAIDOOK L. AGHAIAN R.C.E. NO. 43293 Exp. 3-31-16 CIVIL STATE OF CALIFORNIA

KH 4/10/14

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 1/20/2015
APPROVED BY: DATE: 1/20/2015

CITY OF PERRIS
APPROVED BY:
CITY ENGINEER DATE: 12-15-14
RECOMMENDED DATE:

PERRIS VALLEY MDP LINE "A-B"

CITY OF PERRIS
FILE NO. P8-1013
PROJECT NO. 4-0-00537
DRAWING NO. 4-1063
SHEET NO. 14 OF 18

Last Update: 11/18/14
O:\2700-2799\2702\2702F\2702SD14.dwg

CAUTION:
PROPOSED WORK IS IN PROXIMITY OF HIGH PRESSURE GAS LINES

C.L. RIDER STREET
EXISTING FINISHED SURFACE
*ULT. 100-YEAR H.G.L.
EX. 3" GAS 1432.84 TOP
EX.1" TELE. CONDUIT (VERIFY)
EX. 3x3" ELEC. CONDUIT 1430.50 TOP
STA. 10+00
1428.81 INV. "S"
48.00 L.F. 30" R.C.P., 0-2000 S=0.0100
1429.29 INV
CONC. BULKHEAD
EX. 36" WATER 1430.52 TOP
1427.73 INV
C.L. 8'X7' RCB
STA. 10+04.40 BEG. PIPE
STA. 10+52.40 END PIPE
HYDRAULIC DATA
*Q100=24.9 CFS
*V=5.1 FPS
LATERAL "A-B-1"
TO BE MAINTAINED BY THE CITY OF PERRIS
STA 12+63.33
SEE PLAN ON SHT. NO. 2

CONST. 26.23 L.F. 24" R.C.P.,0-2000
2
CONST. 7.85 L.F. 24" R.C.P.,D-2000
EXISTING FINISHED SURFACE
CONCRETE BULKHEAD
CONST. COF PER EMWD SPECS.
CONCRETE COLLAR
S=0.0050
S=-0.436
1432.39INV
1432.27 INV-24"
PH-1 EX. 36" WATER 1431.47 TOP
STA. 10+39.73 END. PIPE
STA. 10+13.80 G.B. 1432.26 INV
STA. 10+05.65 BEG. PIPE
1428.84 INV. "S"
1427.76 INV
C.L. 8'X7' RCB
*ULT. 100-YEAR H.G.L.
HYDRAULIC DATA
*Q100=18.7 CFS
*V=6.0 FPS
LATERAL "A-B-2"
TO BE MAINTAINED BY THE CITY OF PERRIS
STA 12+75.33
SEE PLAN ON SHT. NO. 2

NOTE:
CONTRACTOR SHALL PROTECT IN PLACE ALL UTILITIES CROSSING OR PARALLELING THE STORM DRAIN UNLESS OTHERWISE NOTED.
C.L. RIDER STREET
EXISTING FINISHED SURFACE
CONST. 2 L.F. 30" R.C.P.,0-2000
*ULT. 100-YEAR H.G.L.
EX. 36" WATER 1434.09 TOP (TO BE RELOCATED) BY OTHERS
CONCRETE BULKHEAD
STA. 10+00
2"
S=0.010
1430.54 INV. "S"
17" CLR
1430.81 INV.
STA. 10+32.99 END PIPE
1427.53 INV-36" W/ FUT. 36" RELOCATION
STA. 10+05.65 BEG. PIPE
C.L. 8'X7' RCB
HYDRAULIC DATA
*Q100=24.8 CFS
*V=5.1 FPS
FUT. LATERAL BY OTHERS
STA 17+58.82
SEE PLAN ON SHT. NO. 3
LATERAL "A-B-3"
TO BE MAINTAINED BY THE CITY OF PERRIS

PROTECT IN PLACE EXISTING UTILITY LINE. FIELD VERIFY INVERT ELEVATIONS INFORM ENGINEER FOR ANY ELEVATION DISCREPANCIES PRIOR TO CONSTRUCTION

C.L. RIDER STREET
PH-2 EX. ELECT. 1433.66 BOT
EXISTING SURFACE
PH-3 EX. 1" TELE CONDUIT 1432.07 BOT PROTECT IN PLACE
ULT. 100-YEAR H.G.L.*
EX. 3" GAS 1434.22 TOP (VERIFY)
PH-4 EX. 2x3" ELECT. 1432.07 BOT
1.9'± CLR.
2.19'± CLR.
3.07'± CLR.
0.24'± CLR.
STA. 10+00
1430.00 INV "S"
S=0.003
42.79 L.F. 18" R.C.P., 0-2000
S=0.003
EX. 36" WATER 1434.0 TOP
1429.78 INV
C.L. TS NO.2
STA. 10+05.66 BEG. PIPE
STA 10+20.77 B.C. 1430.05 INV.
STA 10+38.45 E.C. 1430.10 INV.
STA 10+48.45 END PIPE 1430.13 INV.
CONC. BULKHEAD
HYDRAULIC DATA
*Q100=15.7 CFS
*V=8.9 FPS
LATERAL "A-B-4"
TO BE MAINTAINED BY THE CITY OF PERRIS
STA 17+70.62
SEE PLAN ON SHT. NO. 3

*ULT. 100-YEAR H.G.L.
EXISTING FINISHED SURFACE
EX. 3" GAS (+1435.0 TOP
EXISTING 1" TELE. CONDUIT (±1435.30 TOP)
2
RELOCATE EX. 2" TEL (1436.64 TOP)
RELOCATE EX. 2" TEL (1436.34 TOP)
1439.00 TOP INLET
113.59 L.F. 18" R.C.P. 0-2000
4.31 L.F. 18" R.C.P., 0-2000
S=0.0050
S=0.00
1437.88 FL/INV
1.0'± CLR.
1.5'± CLR.
1436.29 INV.
1431.69 INV. "S"
41.35 L.F. 18" R.C.P., 0-2000 S=0.0050
1.5'± CLR.
EX. 12" SEWER
1430.19 INV
C.L. 8' X 6' RCB
STA 10+05.68 BEG. PIPE
STA 10+47.03 G.B. 1431.90 INV. CONC. COLLAR
STA 10+51.34 G.B. 1436.21 INV. CONC. COLLAR
2" TEL. NEW LOCATION 1434.09 TOP
PH-5 EX. ELECT. ENCASEMENT
2" TEL. NEW LOCATION 1435.00 TOP
STA 10+64.93 END PIPE 1436.28 INV.
HYDRAULIC DATA
* Q100=2.0 CFS
* V=1.1 FPS
STA 18+41.88
SEE PLAN ON SHT. NO. 4
LATERAL "A-B-5"
TO BE MAINTAINED BY THE CITY OF PERRIS
STA 18+41.89
SEE PLAN ON SHT. NO. 4

C.L. RIDER STREET
*ULT. 100-YEAR H.G.L.
EXISTING FINISHED SURFACE
EX. 1" TELE. CONDUIT ±1436.43 TOP (VERIFY)
PH-9 (1436.35TOP) EX. 2"C COMM
2
EX. 3" GAS 1435.75 TOP
STA. 10+00
1434.0
1432.00 INV "S"
40.88 L.F. 24" R.C.P., 0-2000 S=0.003
1431.42 INV
C.L. 8'x6' RCB
STA. 10+05.66 BEG. PIPE
1432.00 INV
STA. 10+07.78 END PIPE 1432.01 INV.
EX. 12" SEWER 1429.24 INV 1430.32 TOP
HYDRAULIC DATA
*Q100=13.8 CFS
* V=4.4 FPS
LATERAL "A-B-7"
TO BE MAINTAINED BY THE CITY OF PERRIS
STA 22+49.41
SEE PLAN ON SHT. NO. 5

1439.13 INV/FL
1440.25 TOP INLET
CONC. BULKHEAD
LAT. "A-16"
EX. 36" WATER 1435.37 TOP
C.L. RIDER STREET
*ULT. 100-YEAR H.G.L.
20.76 L.F. 36" R.C.P., 0-1750 S=0.005
17" CLR
1431.97 INV. "S"
STA. 10+00
CONC. BULKHEAD
1432.13 INV
1432.10 INV
EX. 36" WATER TO BE RELOCATED BY OTHERS
FUT. LATERAL BY OTHERS
STA 10+48.66 END PIPE
STA 10+29.45 END PIPE 1432.09 INV.
1426.90 INV-36" W/ FUT. 36" RELOCATION
STA 10+08.69 BEG. PIPE 1431.99 INV.
STA 10+05.65
1431.38 INV
C.L. 8'x6' RCB
HYDRAULIC DATA
*Q100=40.1 CFS
* V=5.7 FPS
LATERAL "A-B-6"
TO BE MAINTAINED BY THE CITY OF PERRIS
STA 22+36.21
SEE PLAN ON SHT. NO. 5

PH-15 (1439.57) EX. 2-2"C
PH-14 PROTECT IN PLACE (1437.75 TOP) (1435.59 BOT)
C.L. RIDER STREET
*ULT. 100-YEAR H.G.L.
S=0.0040
6"± CLR
31.24 L.F. 2-24" R.C.P. 0-2000
CONST. COF PER EMWD SPECS.
1.6'± CLR
0.53'
1434.52 INV "S"
STA. 10+00
STA 10+37.42 CONC. BULKHEAD 1438.50 INV.
(1436.56) TOP EX. 24" WATER
STA 10+12.43 GB-CONC. COLLAR 1438.40 INV.
STA 10+08.55 BEGIN PIPE 1436.32 INV.
STA 10+05.21
1433.93 INV
C.L. TS NO.2
HYDRAULIC DATA
* Q100=36.0 CFS/PIPE
* V=11.5 FPS
LATERAL "A-B-9"
TO BE MAINTAINED BY CITY OF PERRIS
STA 30+85.05
SEE PLAN ON SHT. NO. 7

PROFILE SCALE:
HORIZ. - 1" = 5'
VERT. - 1" = 5'

Don't Dig...Until You Call U.S.A. Toll Free 1-800-227-2600 for the location of buried utility lines. Don't disrupt vital services.
TWO WORKING DAYS BEFORE YOU DIG

CAUTION:
PROPOSED WORK IS IN PROXIMITY OF HIGH PRESSURE GAS LINES

* THE ULTIMATE H.G.L. IS BASED ON THE AOOPTEO MOP WATER SURFACE ELEVATION OF 1433 IN THE PERRIS VALLEY STORM CHANNEL (PVSC) AT RIDER STREET, ANO ASSUMES THAT FULL CHANNEL IMPROVEMENTS HAVE BEEN CONSTRUCTEO PER THE AOOPTED MDP. FOR ALL WATER SURFACE ELEVATIONS BETWEEN 1433 ANO THE 100-YEAR FLOOO ELEVATION FOR PVSC (1437.5), LINE "A-B" WILL NOT HAVE CAPACITY FOR LOCAL 100-YEAR FLOWS.

BENCH MARK
COUNTY OF RIVERSIDE BENCHMARK NO. "M-31"
COUNTY OF RIVERSIDE BENCHMARK - 3 1/4" ALUMINUM DISK MARKED M-31, LOCATED FLUSH AT THE SOUTH WEST CORNER OF BRIDGE ON TOP OF SIDEWALK NEAR FACE OF CURB LOCATED AT THE CROSSING OF PERRIS BLVD. AND RIV. CO. FLOOD CONTROL CHANNEL (PERRIS LATERAL "A"). 43 FT. WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE BARRIER. (EDGE OF BRIDGE) MARKED R-102 D.W.R. IN TOP OF CONC. POST FLUSH W/ GROUND
ELEVATION = 1474.874' (NAVD 1929)

REF.	REVISIONS	ENGINEER APPR.	ENGINEER DATE	RCFC/ APPR.	RCFC/ DATE
2	CHANGED SLOPE TO 0.0015, ADDED MH, ADDED NEW 10"S, CHANGED 42" LAT TO 24" LAT. ADDED EX. UTILITIES, RELOCATE UTILITIES, REVISED SD	H.I.A.	2/25/16	DJG	2/25/16
1	CHANGED CAST IN PLACE RCB TO PRE-CAST RCB PER APWA 390-0	H.I.A.	2/25/16	DJG	2/25/16

DESIGNED BY:
DRAWN BY:
DATE DRAWN:

APPROVED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173
HAIDOOK I. AGHAIAN Date: 2/1/16 RCE NO. 43293

REGISTERED PROFESSIONAL ENGINEER HAIDOOK I. AGHAIAN R.C.E. NO. 43293 Exp. 3-31-16 CIVIL STATE OF CALIFORNIA

KTH 2/17/16

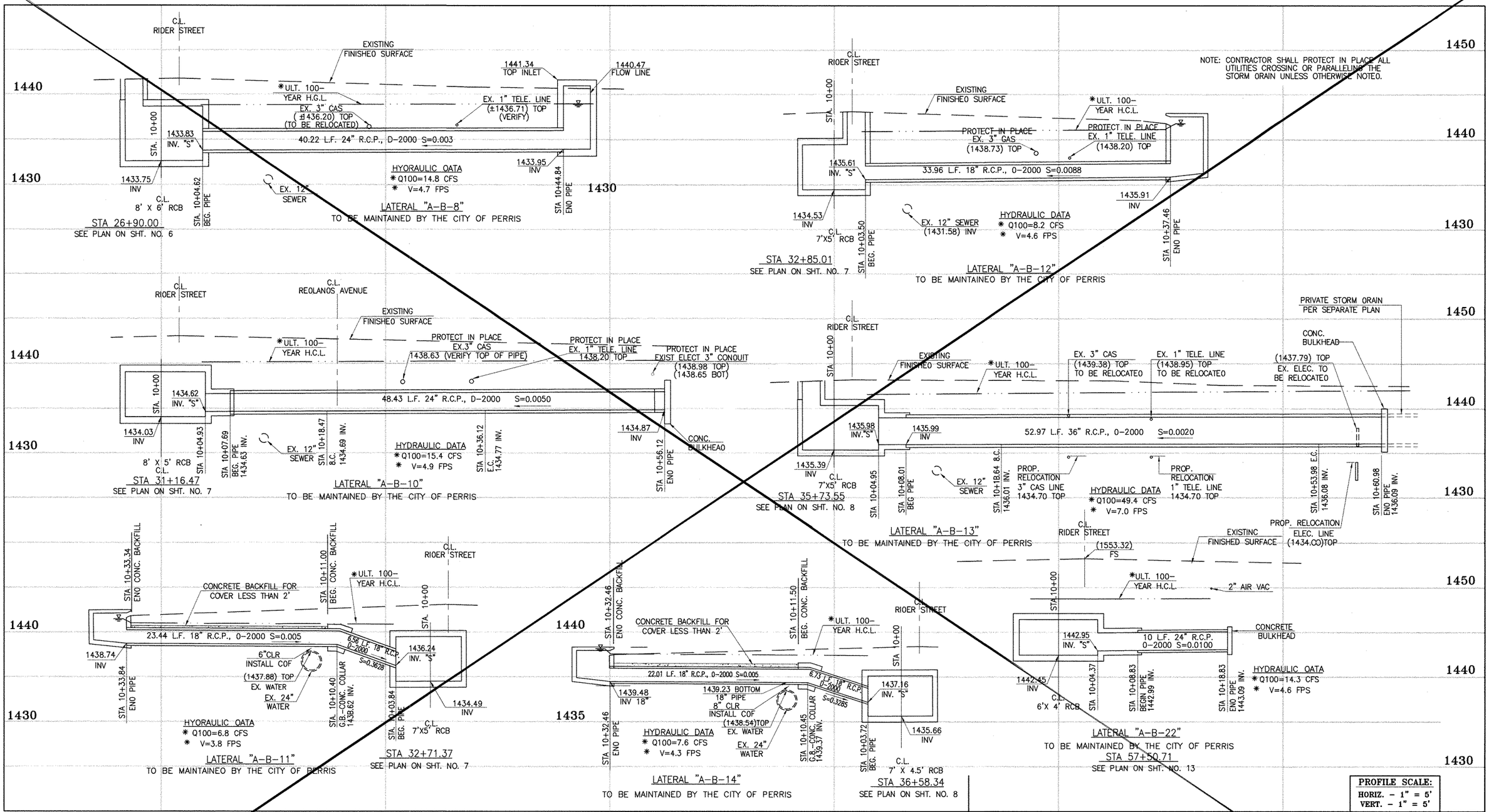
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE:
APPROVED BY: DATE:

CITY OF PERRIS
APPROVED BY:
CITY ENGINEER DATE: 2-9-16
RECOMMENDED DATE:

PERRIS VALLEY MDP
LINE "A-B"

CITY OF PERRIS
FILE NO. P8-1013
PROJECT NO. 4-0-00537
DRAWING NO. 4-1063
SHEET NO. 14A OF 18

Last Update:1/29/16
O:\2700-2799\2702\2702F\2702SD14.dwg



PROFILE SCALE:
HORIZ. - 1" = 5'
VERT. - 1" = 5'

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1-800-227-2600
for the location of buried utility lines.
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TWO WORKING DAYS BEFORE YOU DIG

CAUTION:
PROPOSED WORK IS IN PROXIMITY OF HIGH PRESSURE GAS LINES

* THE ULTIMATE H.C.L. IS BASEO ON THE AOOPTEO M0P WATER SURFACE ELEVATION OF 1433 IN THE PERRIS VALLEY STORM CHANNEL (PVSC) AT RIOER STREET, ANO ASSUMES THAT FULL CHANNEL IMPROVEMENTS HAVE BEEN CONSTRUCTEO PER THE AOOPTEO MOP. FOR ALL WATER SURFACE ELEVATIONS BETWEEN 1433 ANO THE 100-YEAR FLOOO ELEVATION FOR PVSC (1437.5), LINE "A-B" WILL NOT HAVE CAPACITY FOR LOCAL 100-YEAR FLOWS.

BENCH MARK
COUNTY OF RIVERSIDE BENCHMARK NO. "A-31"
COUNTY OF RIVERSIDE BENCHMARK, 3 1/4" ALUMINUM DISK MARKED M-31, LOCATED FLUSH AT THE SOUTH WEST CORNER OF BRIDGE ON TOP OF SIDEWALK NEAR FACE OF CURB LOCATED AT THE CROSSING OF PERRIS BLVD. AND IRV. CO. FLOOD CONTROL CHANNEL (PERRIS LATERAL "A"), 43 FT. WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE BARRIER. (EDGE OF BRIDGE) MARKED B-102 D.W.R. IN TOP OF CONC. POST FLUSH W/ GROUND
ELEVATION = 1474.674' (NAVD 1929)

REF.	DESCRIPTION	APPR.	DATE	APPR.	DATE
	SUPERSEDED BY SHEET 15A	H.H.A.	2/25/16	RFC	3/15/16

DESIGNED BY: BW
DRAWN BY: ET
DATE DRAWN:

APPROVED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173
Date: 11/18/14
HAIDOOK I. AGHAIAN RCE NO. 43293

REGISTERED PROFESSIONAL ENGINEER HAIDOOK I. AGHAIAN R.C.E. NO. 43293 Exp. 3-31-16 CIVIL STATE OF CALIFORNIA

KFH 4/10/14

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY:
DATE: 11/20/2015
APPROVED BY:
DATE: 1/20/2015

CITY OF PERRIS
APPROVED BY:
CITY ENGINEER
DATE: 12-15-14
RECOMMENDED
DATE:

PERRIS VALLEY MDP LINE "A-B"

CITY OF PERRIS
FILE NO. P8-1013
PROJECT NO. 4-0-00537
DRAWING NO. 4-1063
SHEET NO. 15 OF 18

Last Update: 11/18/14
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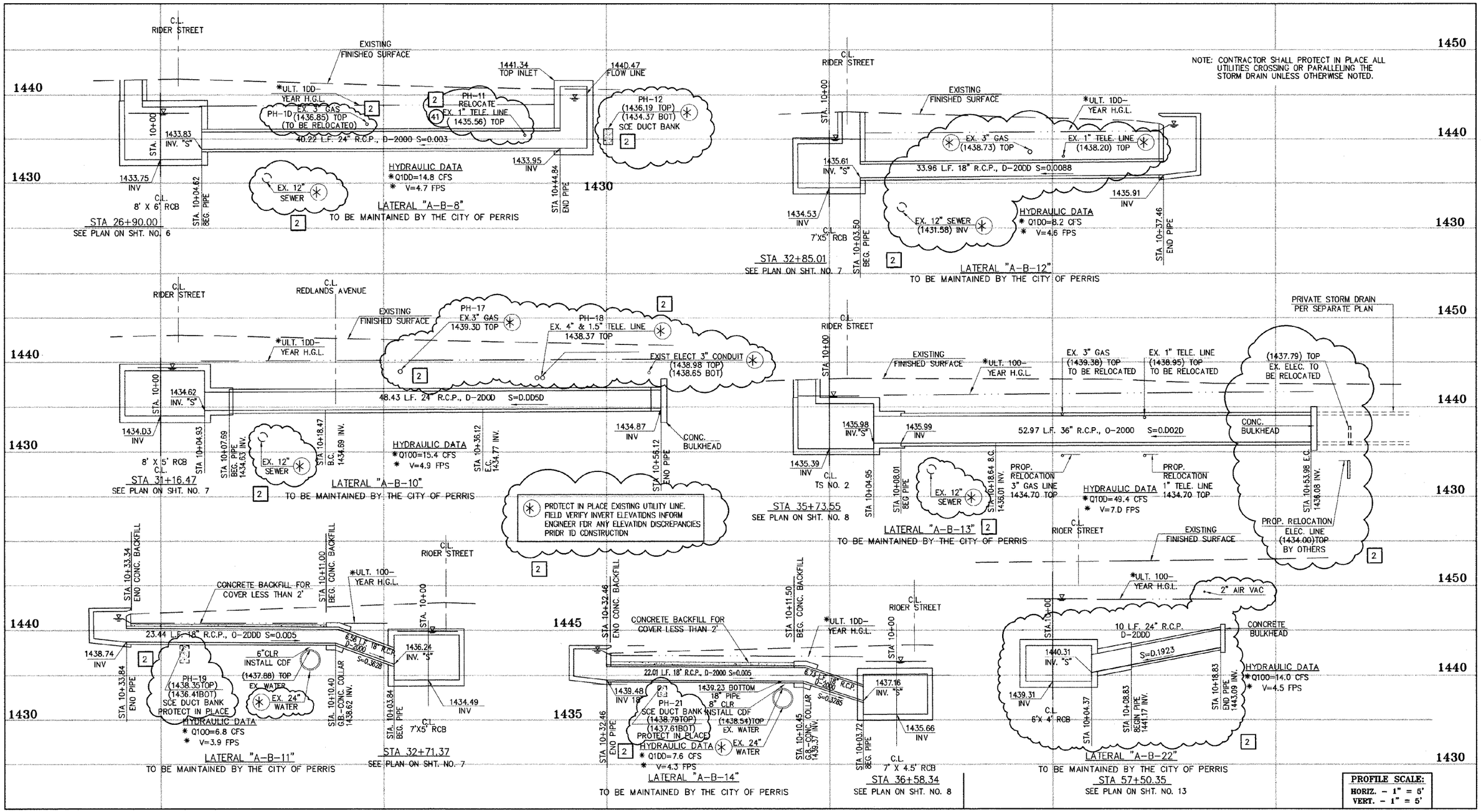

Don't Dig...Until You Call U.S.A. Toll Free 1-800-227-2600 for the location of buried utility lines. Don't disrupt vital services.
TWO WORKING DAYS BEFORE YOU DIG

CAUTION:
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* THE ULTIMATE H.G.L. IS BASED ON THE ADOPTED MDP WATER SURFACE ELEVATION OF 1433 IN THE PERRIS VALLEY STORM CHANNEL (PVSC) AT RIDER STREET, AND ASSUMES THAT FULL CHANNEL IMPROVEMENTS HAVE BEEN CONSTRUCTED PER THE ADOPTED MDP. FOR ALL WATER SURFACE ELEVATIONS BETWEEN 1433 AND THE 100-YEAR FLOOD ELEVATION FOR PVSC (1437.5), LINE "A-B" WILL NOT HAVE CAPACITY FOR LOCAL 100-YEAR FLOWS.

BENCH MARK
COUNTY OF RIVERSIDE BENCHMARK NO. "M-31"
COUNTY OF RIVERSIDE BENCHMARK - 3 1/4" ALUMINUM DISK MARKED M-31, LOCATED FLUSH AT THE SOUTH WEST CORNER OF BRIDGE ON TOP OF SIDEWALK NEAR FACE OF CURB LOCATED AT THE CROSSING OF PERRIS BLVD. AND RTE. CO. FLOOD CONTROL CHANNEL (PERRIS LATERAL "A"), 43 FT. WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE BARRIER, EDGE OF BRIDGE) MARKED R-102 D.W.R. IN TOP OF CONC. POST FLUSH W/ GROUND
ELEVATION = 1474.074' (NAVD 1929)

REF.	DESCRIPTION	ENGINEER APPR	ENGINEER DATE	RCFC/ APPR	RCFC/ DATE
2	CHANGED SLOPE TO 0.0015, ADDED MH, ADDED NEW 10"S, CHANGED 42" LAT TO 24" LAT ADDED EX. UTILITIES, RELOCATE UTILITIES, REVISED SD	H.I.A.	2/25/16	n/a	2/17/16
1	CHANGED CAST IN PLACE RCB TO PRE-CAST RCB PER APWA 300-0	H. I.A	2/25/16	n/a	2/17/16

DESIGNED BY:
DRAWN BY:
DATE DRAWN:

APPROVED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173
HAIDOOK L. AGHAIAN Date: 2/1/16
RCE NO. 43293

REGISTERED PROFESSIONAL ENGINEER HAIDOOK L AGHAIAN R.C.E. NO. 43293 Exp. 3-31-18 CIVIL STATE OF CALIFORNIA

KPH 2/17/16

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

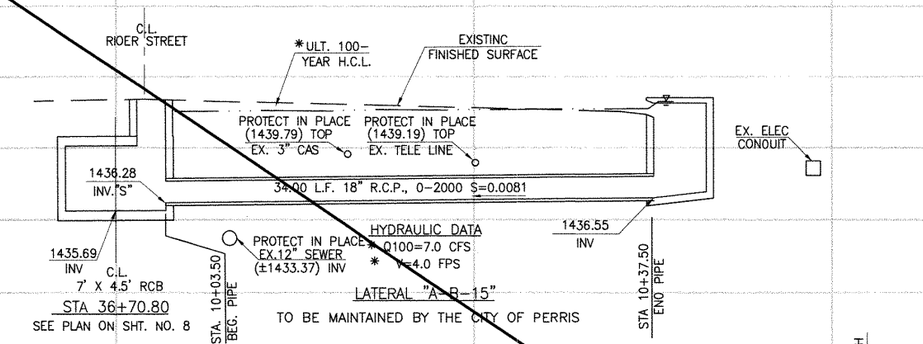
CITY OF PERRIS
APPROVED BY:
CITY ENGINEER: DATE: 2-5-16
RECOMMENDED DATE:

PERRIS VALLEY MDP LINE "A-B"

CITY OF PERRIS FILE NO. P8-1013
PROJECT NO. 4-0-00537
DRAWING NO. 4-1063
SHEET NO. 15A OF 18

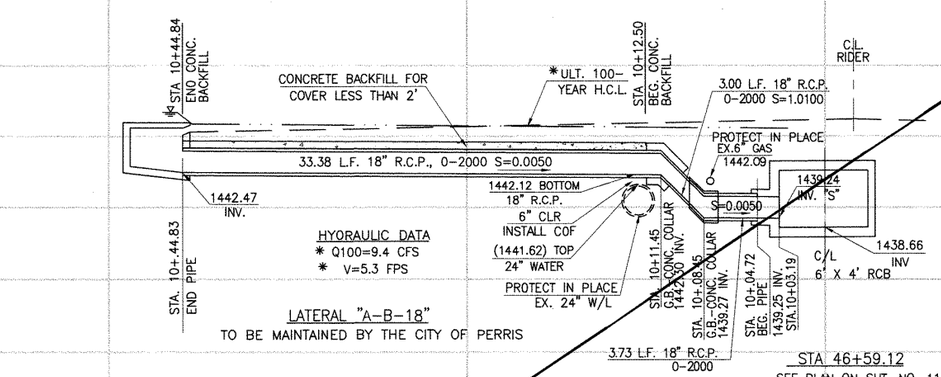
Last Update:1/29/16
O:\2700-2799\2702\2702S\2702SD15.dwg

NOTE: CONTRACTOR SHALL PROTECT IN PLACE ALL UTILITIES CROSSINC OR PARALLELINC THE STORM ORAIN UNLESS OTHERWISE NOTEO.



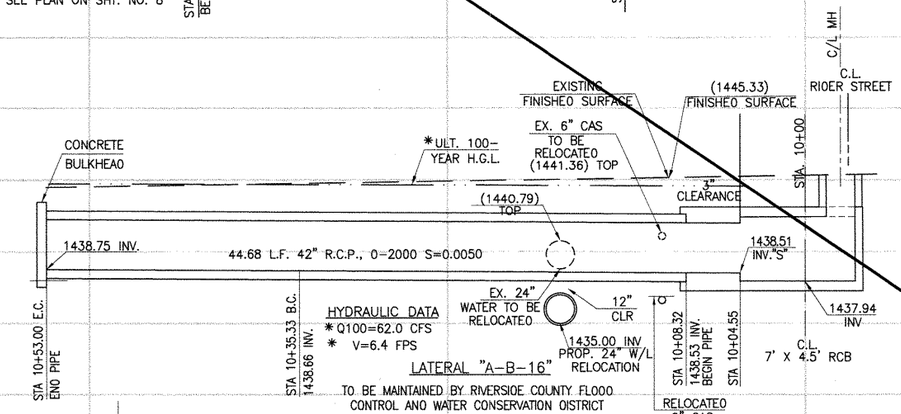
STA 36+70.80
SEE PLAN ON SHT. NO. 8

LATERAL "A-B-15"
TO BE MAINTAINED BY THE CITY OF PERRIS



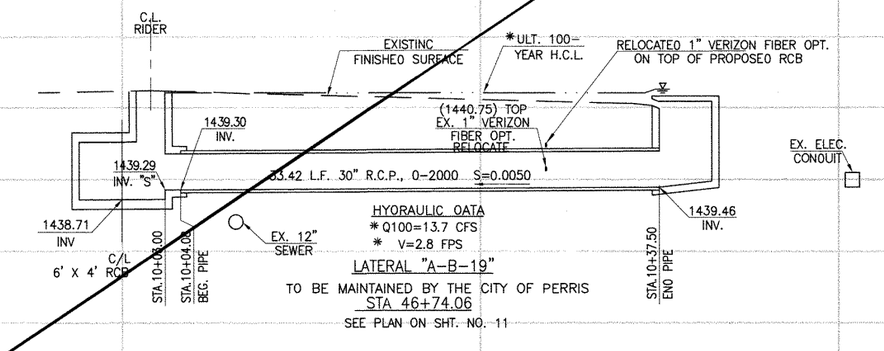
LATERAL "A-B-18"
TO BE MAINTAINED BY THE CITY OF PERRIS

STA 46+59.12
SEE PLAN ON SHT. NO. 11



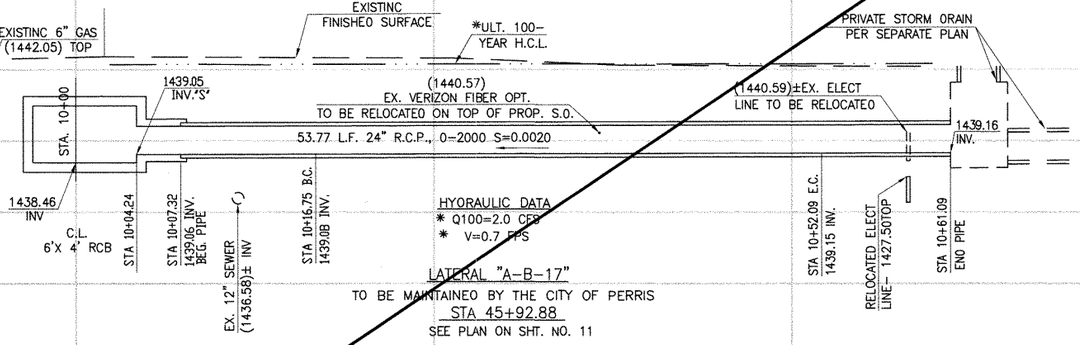
LATERAL "A-B-16"
TO BE MAINTAINED BY RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

STA 44+18.81
SEE PLAN ON SHT. NO. 10



LATERAL "A-B-19"
TO BE MAINTAINED BY THE CITY OF PERRIS

STA 46+74.06
SEE PLAN ON SHT. NO. 11



LATERAL "A-B-17"
TO BE MAINTAINED BY THE CITY OF PERRIS

STA 45+92.88
SEE PLAN ON SHT. NO. 11

PROFILE SCALE:
HORIZ. - 1" = 5'
VERT. - 1" = 5'

✳ THE ULTIMATE H.G.L. IS BASED ON THE ADOPTED MDP WATER SURFACE ELEVATION OF 1433 IN THE PERRIS VALLEY STORM CHANNEL (PVSC) AT RIDER STREET, AND ASSUMES THAT FULL CHANNEL IMPROVEMENTS HAVE BEEN CONSTRUCTED PER THE ADOPTED MDP. FOR ALL WATER SURFACE ELEVATIONS BETWEEN 1433 AND THE 100-YEAR FLOOD ELEVATION FOR PVSC (1437.5), LINE "A-B" WILL NOT HAVE CAPACITY FOR LOCAL 100-YEAR FLOWS.

Don't Dig...Until You Call U.S.A. Toll Free
1-800-227-2600
for the location of buried utility lines.
Don't disrupt vital services.
TWO WORKING DAYS BEFORE YOU DIG

CAUTION:
PROPOSED WORK IS IN PROXIMITY OF HIGH PRESSURE GAS LINES

BENCH MARK
COUNTY OF RIVERSIDE BENCHMARK NO. "M-31"
COUNTY OF RIVERSIDE BENCHMARK "3 1/4" ALUMINUM DISK MARKED M-31, LOCATED FLUSH AT THE SOUTH WEST CORNER OF BRIDGE ON TOP OF SIDEWALK NEAR FACE OF CURB LOCATED AT THE CROSSING OF PERRIS BLVD. AND RIV. CO. FLOOD CONTROL CHANNEL (PERRIS LATERAL 7J) 43 FT. WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE BARRIER. (EDGE OF BRIDGE) MARKED WITH D.M.R. IN TOP OF CONC. POST FLUSH W/ GROUND
ELEVATION = 1474.874' (NAVD 1929)

REF.	REVISIONS / DESCRIPTION	ENGINEER APPR.	ENGINEER DATE	RCFC/ APPR.	RCFC/ DATE
	SUPERSEDED BY SHEET 16A	H.I.A.	2/25/14	9/16	3/25/14

DESIGNED BY: BW
DRAWN BY: ET
DATE DRAWN:

APPROVED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173
HAIDOOK I. AGHAIAN Date: 11/18/14
RCE NO. 43293

REGISTERED PROFESSIONAL ENGINEER HAIDOOK I. AGHAIAN R.C.E. NO. 43293 Exp. 3-31-16 CIVIL STATE OF CALIFORNIA

KPH 4/10/14

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 1/14/2015
APPROVED BY: DATE: 1/20/2015

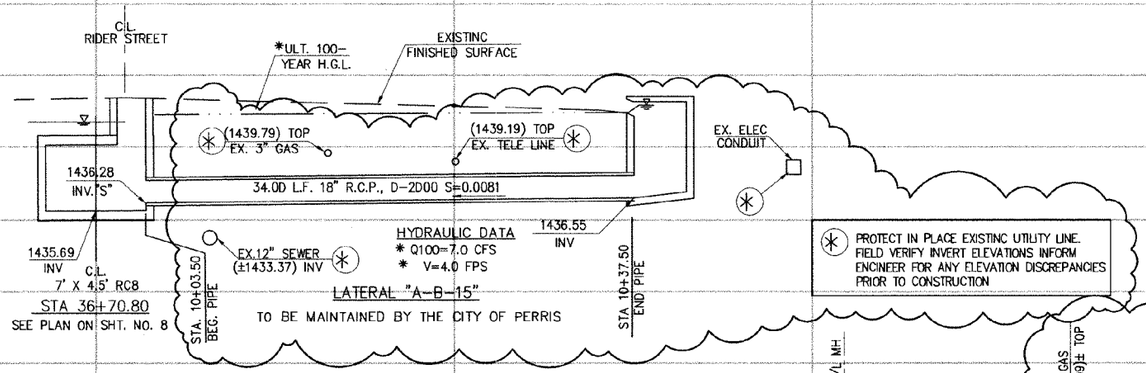
CITY OF PERRIS
APPROVED BY:
CITY ENGINEER DATE: 12-15-14
RECOMMENDED DATE:

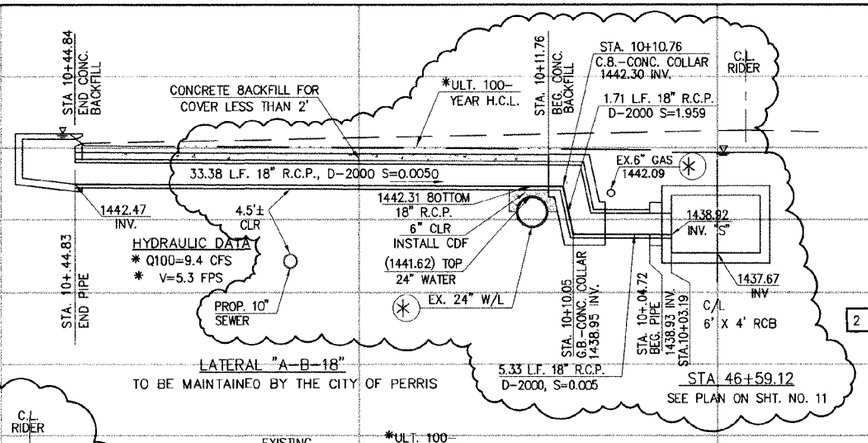
PERRIS VALLEY MDP LINE "A-B"

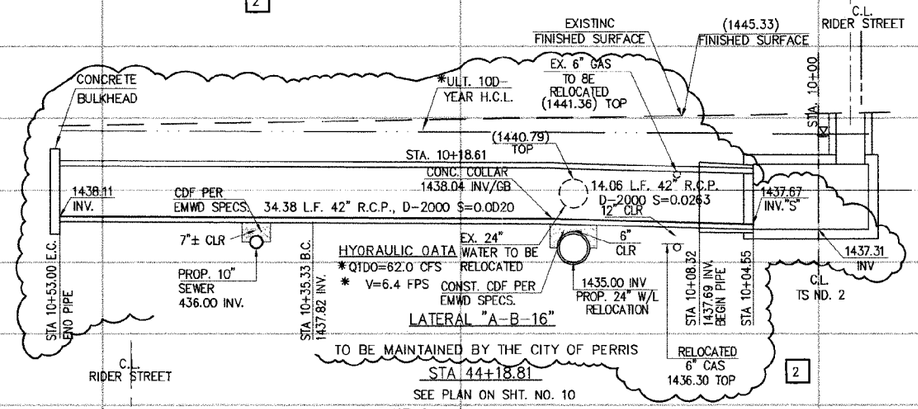
CITY OF PERRIS
FILE NO. P8-1013
PROJECT NO. 4-0-00537
DRAWING NO. 4-1063
SHEET NO. 16 OF 18

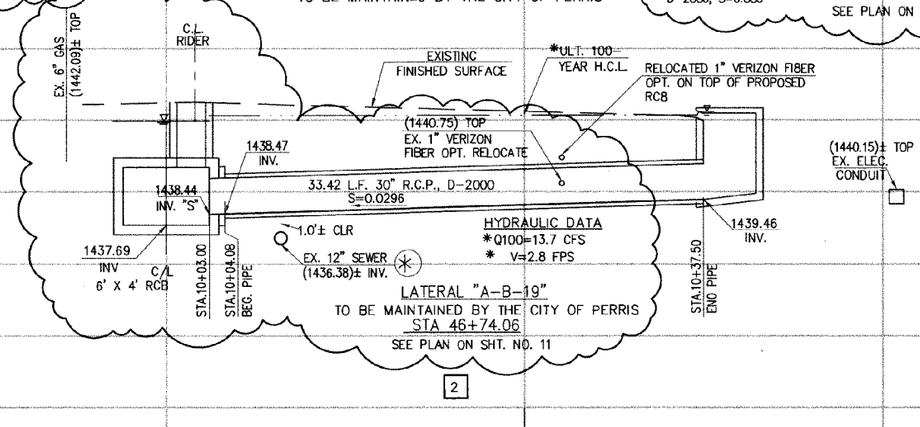
Last Update: 10/6/14
G:\2700-2799\2702\2702F\2702SD16.dwg

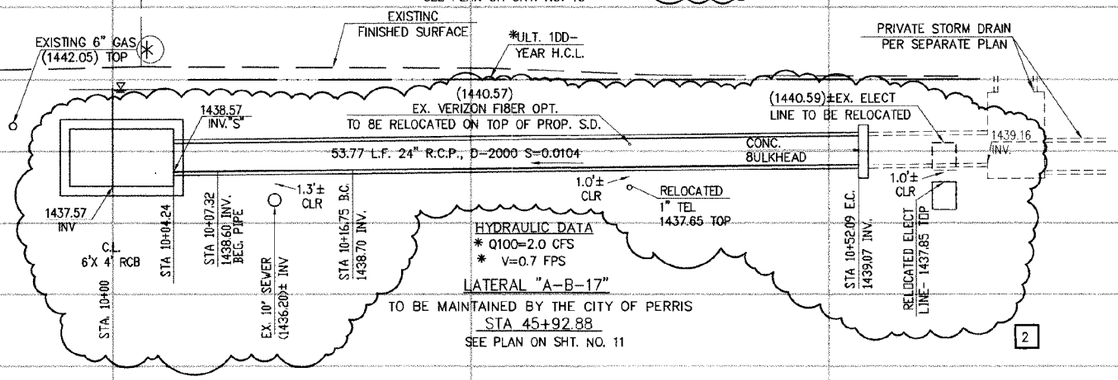
NOTE: CONTRACTOR SHALL PROTECT IN PLACE ALL UTILITIES CROSSING OR PARALLELING THE STORM DRAIN UNLESS OTHERWISE NOTED.

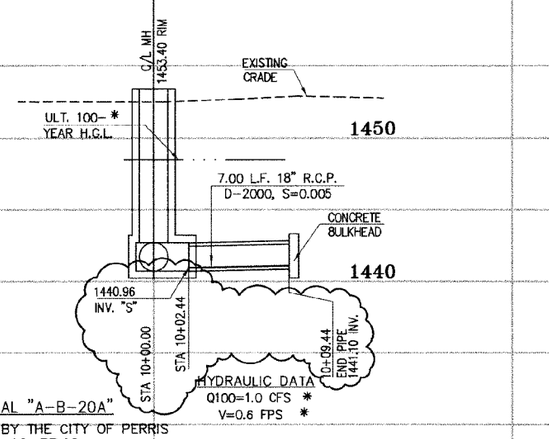












PROFILE SCALE:
HORIZ. - 1" = 5'
VERT. - 1" = 5'

* THE ULTIMATE H.G.L. IS BASED ON THE AOOPTED MOP WATER SURFACE ELEVATION OF 1433 IN THE PERRIS VALLEY STORM CHANNEL (PVSC) AT RIOER STREET, ANO ASSUMES THAT FULL CHANNEL IMPROVEMENTS HAVE BEEN CONSTRUCTEO PER THE AOOPTEO MOP. FOR ALL WATER SURFACE ELEVATIONS BETWEEN 1433 ANO THE 100-YEAR FLOOD ELEVATION FOR PVSC (1437.5), LINE "A-B" WILL NOT HAVE CAPACITY FOR LOCAL 100-YEAR FLOWS.

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TWO WORKING DAYS BEFORE YOU DIG

CAUTION: PROPOSED WORK IS IN PROXIMITY OF HIGH PRESSURE GAS LINES

BENCH MARK
COUNTY OF RIVERSIDE BENCHMARK NO. "B-31"
COUNTY OF RIVERSIDE BENCHMARK - 3 1/4" ALUMINUM DISK MARKED B-31, LOCATED FLUSH AT THE SOUTH WEST CORNER OF BRIDGE ON TOP OF SIDEWALK NEAR FACE OF CURB LOCATED AT THE CROSSING OF PERRIS BLVD. AND RIV. CO. FLOOD CONTROL CHANNEL (PERRIS LATERAL "A"), 43 FT. WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE BARRIER, EDGE OF BRIDGE) MARKED R-102 D.M.R. IN TOP OF CONC. POST FLUSH W/ GROUND
ELEVATION = 1474.674' (NAVD 1929)

REF.	DESCRIPTION	ENGINEER APPR.	ENGINEER DATE	RCFC/ APPR.	RCFC/ DATE
2	CHANGED SLOPE TO 0.0015, ADDED MH, ADDED NEW 10"S, CHANGED 42" LAT TO 24" LAT ADDED EX. UTILITIES, RELOCATE UTILITIES, REVISED SD	H.L.A.	2/29/16	DG	2/29/16
1	CHANGED CAST IN PLACE RCB TO PRE-CAST RCB PER APWA 300-0	H.L.A.	2/29/16	DG	2/29/16

DESIGNED BY:
DRAWN BY:
DATE DRAWN:

APPROVED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173
Haidook I. Aghaian Date: 2/1/16
HAIDOOK I. AGHAIAN RCE NO. 43293

REGISTERED PROFESSIONAL ENGINEER HAIDOOK I. AGHAIAN R.C.E. NO. 43293 Exp. 3-31-18 CIVIL STATE OF CALIFORNIA

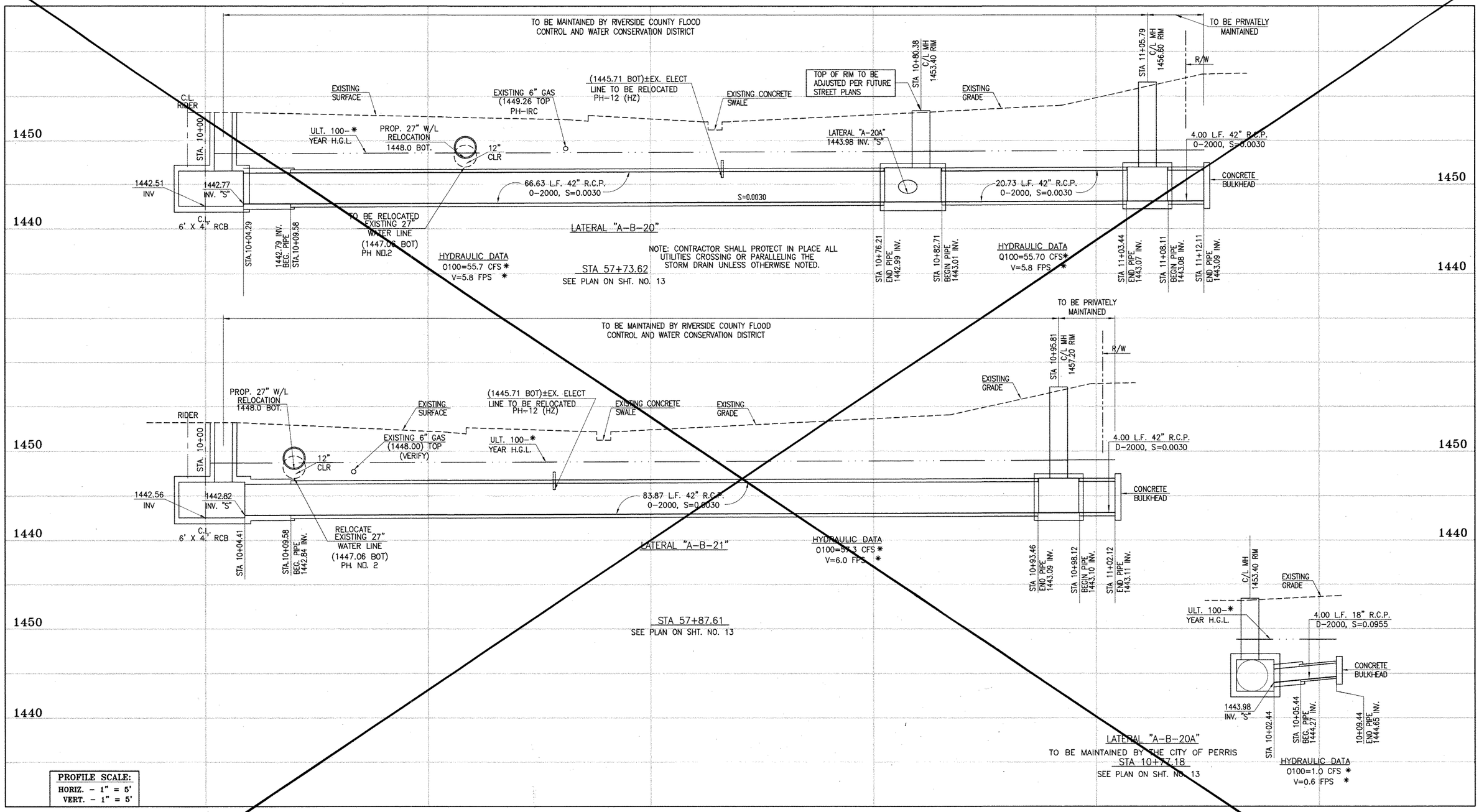
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE:
APPROVED BY: DATE:

CITY OF PERRIS
APPROVED BY:
CITY ENGINEER DATE: 2-9-16
RECOMMENDED DATE:

PERRIS VALLEY MDP LINE "A-B"

CITY OF PERRIS FILE NO. P8-1013
PROJECT NO. 4-0-00537
DRAWING NO. 4-1063
SHEET NO. 16A OF 18

Last Update: 1/29/16
O:\2700-2799\2702\27025\2702SD16.dwg



PROFILE SCALE:
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VERT. - 1" = 5'

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CAUTION:
PROPOSED WORK IS IN PROXIMITY OF HIGH PRESSURE GAS LINES

✳ THE ULTIMATE H.G.L. IS BASED ON THE ADOPTED MDP WATER SURFACE ELEVATION OF 1433 IN THE PERRIS VALLEY STORM CHANNEL (PVSC) AT RIDER STREET, AND ASSUMES THAT FULL CHANNEL IMPROVEMENTS HAVE BEEN CONSTRUCTED PER THE ADOPTED MDP. FOR ALL WATER SURFACE ELEVATIONS BETWEEN 1433 AND THE 100-YEAR FLOOD ELEVATION FOR PVSC (1437.5), LINE "A-B" WILL NOT HAVE CAPACITY FOR LOCAL 100-YEAR FLOWS.

BENCH MARK
COUNTY OF RIVERSIDE BENCHMARK NO. "M-31"
COUNTY OF RIVERSIDE BENCHMARK, 3" 1/4" ALUMINUM DISK MARKED M-31, LOCATED FLUSH AT THE SOUTH WEST CORNER OF BRIDGE ON TOP OF SIDEWALK NEAR FACE OF CURB LOCATED AT THE CROSSING OF PERRIS BLVD. AND RIV. CO. FLOOD CONTROL CHANNEL (PERRIS LATERAL "A"), 43 FT. WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE SINGLE BARRIER, (EDGE OF BRIDGE) MARKED BY "O" IN "102 D.W.R." IN TOP OF CONC. POST FLUSH W/ GROUND
ELEVATION = 1476.674' (NAVD 1929)

REF.	REVISIONS	ENGINEER	DATE	RCFC/	DATE
	SUPERSEDED BY SHEET 17A	H.I.A.	2/25/14	MS	2/27/14

DESIGNED BY: BN
DRAWN BY: ET
DATE DRAWN:

APPROVED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173
HAIDOOK I. AGHAIAN Date: 11/18/14 RCE NO. 43293

REGISTERED PROFESSIONAL ENGINEER HAIDOOK I. AGHAIAN R.C.E. NO. 43293 Exp. 3-31-16 CIVIL STATE OF CALIFORNIA

KFH 4/10/14

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 1/29/2015
APPROVED BY: DATE: 1/20/2015

CITY OF PERRIS
APPROVED BY:
CITY ENGINEER 12-15-14 DATE:
RECOMMENDED DATE:

PERRIS VALLEY MDP LINE "A-B"

CITY OF PERRIS
FILE NO. P8-1013
PROJECT NO. 4-0-00537
DRAWING NO. 4-1063
SHEET NO. 17 OF 18

Last Update: 11/18/14
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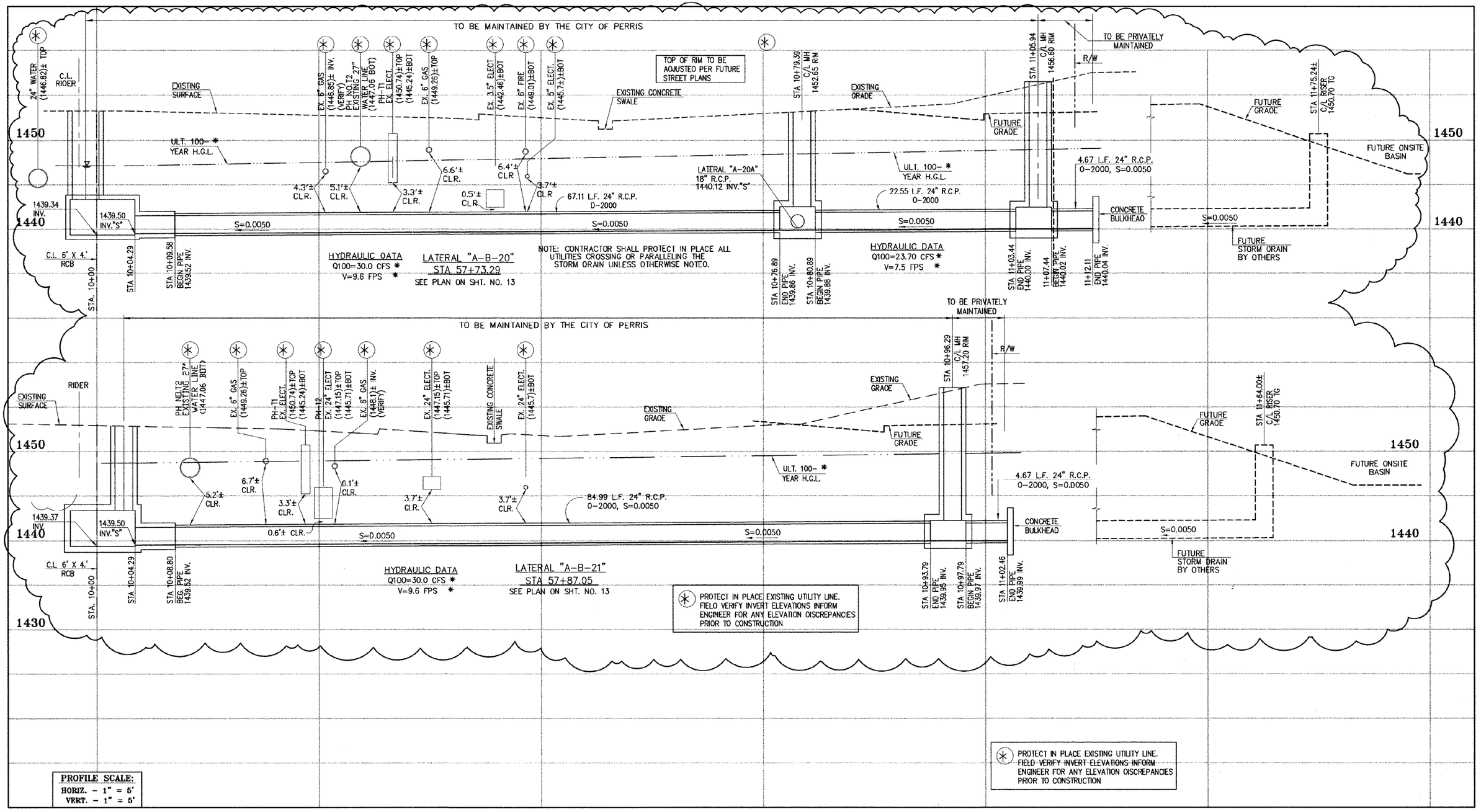

Don't Dig...Until You Call U.S.A. Toll Free 1-800-227-2600 for the location of buried utility lines. Don't disrupt vital services. TWO WORKING DAYS BEFORE YOU DIG

CAUTION: PROPOSED WORK IS IN PROXIMITY OF HIGH PRESSURE GAS LINES

* THE ULTIMATE H.G.L. IS BASED ON THE ADOPTED MDP WATER SURFACE ELEVATION OF 1433 IN THE PERRIS VALLEY STORM CHANNEL (PVSC) AT RIDER STREET, AND ASSUMES THAT FULL CHANNEL IMPROVEMENTS HAVE BEEN CONSTRUCTED PER THE ADOPTED MDP. FOR ALL WATER SURFACE ELEVATIONS BETWEEN 1433 AND THE 100-YEAR FLOOD ELEVATION FOR PVSC (1437.5), LINE "A-B" WILL NOT HAVE CAPACITY FOR LOCAL 100-YEAR FLOWS.

BENCH MARK

COUNTY OF RIVERSIDE BENCHMARK NO. "M-31"

COUNTY OF RIVERSIDE BENCHMARK - 3 1/4" ALUMINUM DISK MARKED M-31, LOCATED FLUSH AT THE SOUTH WEST CORNER OF BRIDGE ON TOP OF SIDEWALK NEAR FACE OF CURB LOCATED AT THE CROSSING OF PERRIS BLVD. AND RIV. CO. FLOOD CONTROL CHANNEL (PERRIS LATERAL "A"). 43 FT. WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE BARRIER. (EDGE OF BRIDGE) MARKED R-103 D.M.R. IN TOP OF CONC. POST FLUSH W/ GROUND

ELEVATION = 1474.874' (NAVD 1929)

REF.	REVISIONS	ENGINEER APPR.	ENGINEER DATE	RCFC/ APPR.	RCFC/ DATE
2	CHANGED SLOPE TO 0.0015, ADDED MH, ADDED NEW 10"S, CHANGED 42" LAT TO 24" LAT ADDED EX. UTILITIES, RELOCATE UTILITIES, REVISED SD	H.I.A.	2/26/16	2/25/16	
1	CHANGED CAST IN PLACE RCB TO PRE-CAST RCB PER APWA 390-0	H.I.A.	2/25/16	2/25/16	

DESIGNED BY:
DRAWN BY:
DATE DRAWN:

APPROVED BY:
Thienes Engineering, Inc.
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LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173
HAIDOOK I. AGHAIAN Date: 2/1/16
RCE NO. 43293

REGISTERED PROFESSIONAL ENGINEER HAIDOOK I. AGHAIAN RCE. NO. 43293 Exp. 1-31-18 CIVIL STATE OF CALIFORNIA

KFR 2/17/16

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

CITY OF PERRIS
APPROVED BY:
CITY ENGINEER 2-5-16 DATE:
RECOMMENDED DATE:

PERRIS VALLEY MDP LINE "A-B"

CITY OF PERRIS FILE NO. P8-1013
PROJECT NO. 4-0-00537
DRAWING NO. 4-1063
SHEET NO. 17A OF 18

Last Update: 1/29/16
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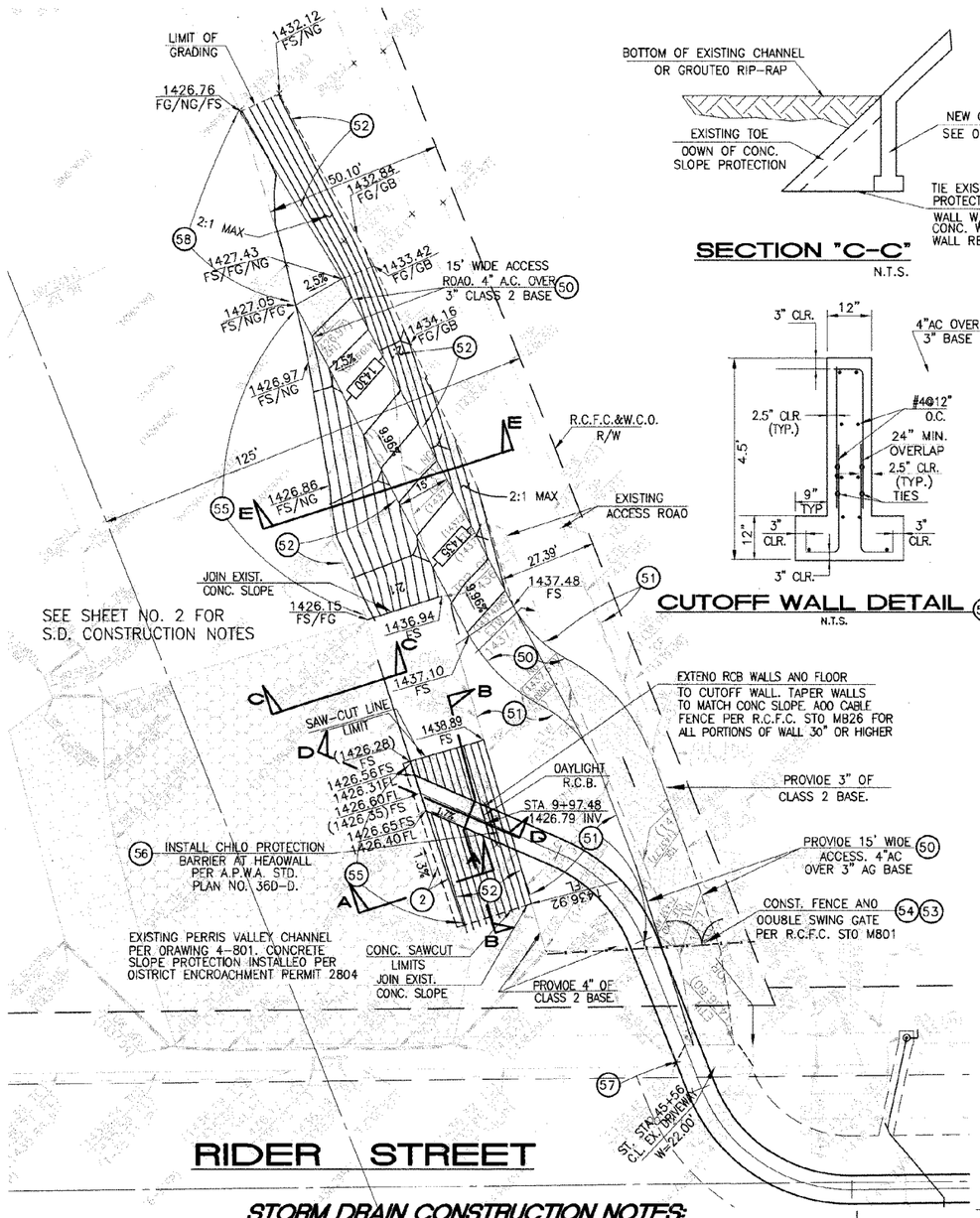
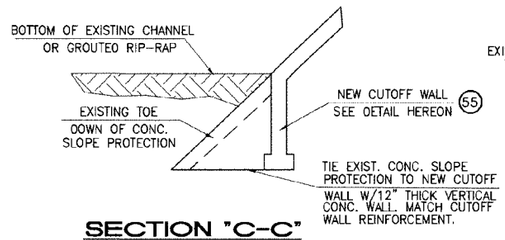
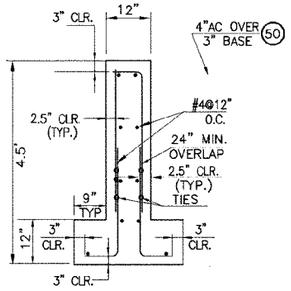
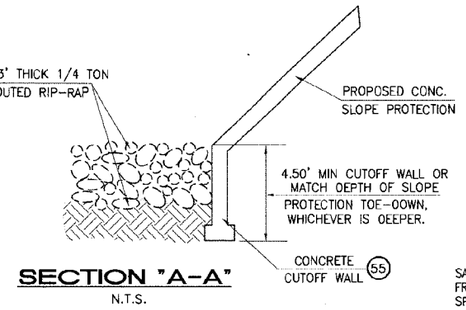




SECTION "C-C"
N.T.S.



CUTOFF WALL DETAIL (58)
N.T.S.



SECTION "A-A"
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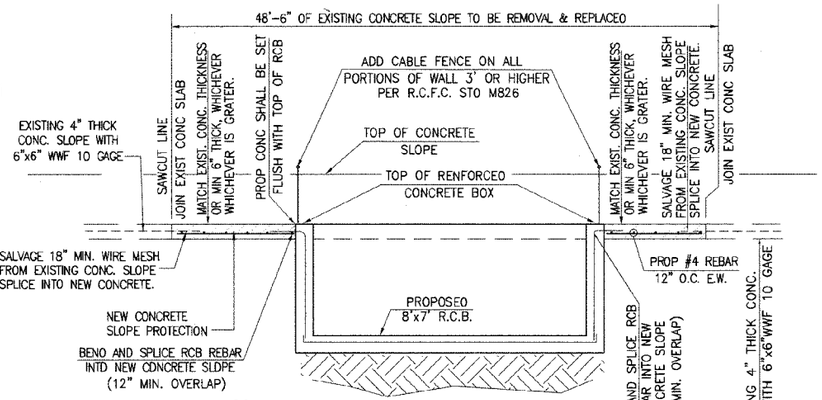

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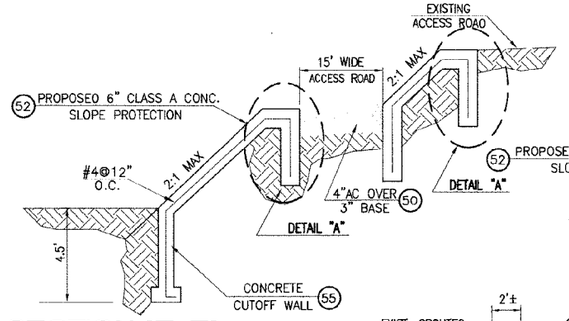

SECTION "E-E"
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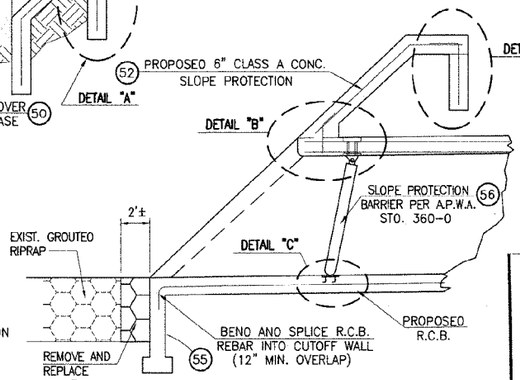

SECTION "D-D"
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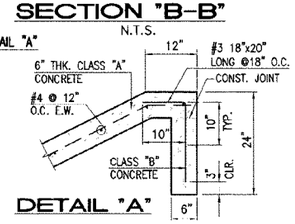
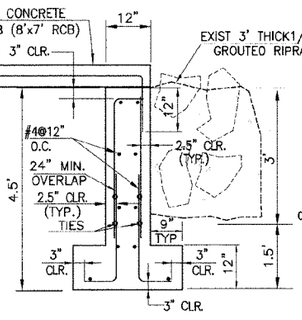
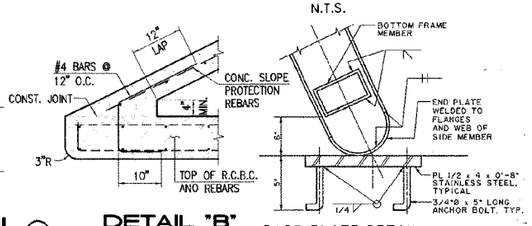


DETAIL "A"



CUTOFF WALL DETAIL (55)
N.T.S.

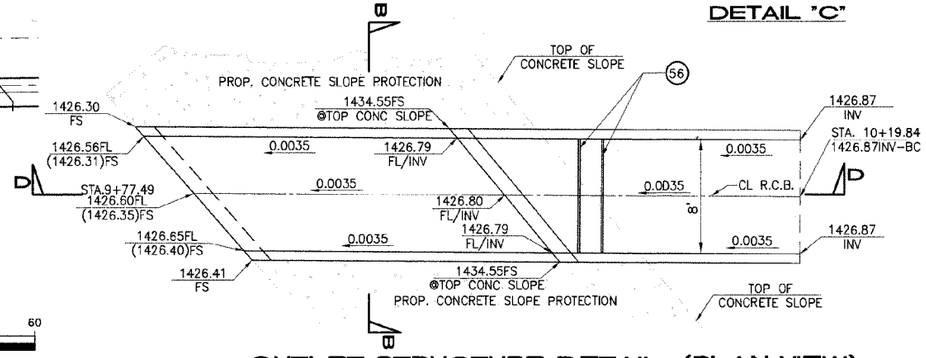


DETAIL "B"

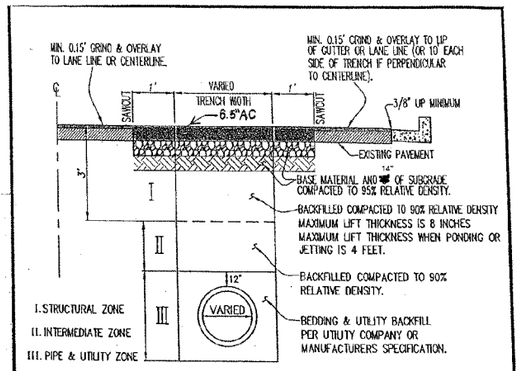
BASE PLATE DETAIL

SLOPE PROTECTION BARRIER A.P.W.A. STD. 36D-D

DETAIL "C"



OUTLET STRUCTURE DETAIL (PLAN VIEW)
N.T.S.



NOTES:

1. STREET STRUCTURAL SECTION TO BE AS FOLLOWS:
   A.C. SURFACING = MATCH EXISTING THICKNESS + ONE INCH.
   BASE = MATCH EXISTING THICKNESS (MUST USE CLASS II BASE)
   ~~IN NO CASE SHALL THE STRUCTURAL SECTION BE LESS THAN 3" OVER 6" CLASS II BASE~~. CITY MAY ALSO SPECIFY STRUCTURAL SECTION FOR ROADWAY IN CERTAIN SITUATIONS.
2. WHEN A FIRM FOUNDATION IS NOT ENCOUNTERED DUE TO SOFT, SPONGY OR OTHER UNSUITABLE MATERIAL SUCH MATERIAL SHALL BE REMOVED TO THE LIMITS DIRECTED BY THE INSPECTOR, AND THE RESULTING EXCAVATION BACKFILLED WITH CLASS II BASE.
3. CONTRACTOR TO PROVIDE INSPECTOR COPY OF COMPACTION REPORTS PRIOR TO PAVING.

CITY OF PERRIS
CITY STANDARD
UTILITY TRENCH SURFACE REPAIR
SCALE: NONE
APPROVED BY:
CITY ENGINEER: DATE: 7-12-06
STD. NO. N/A

STORM DRAIN CONSTRUCTION NOTES

(2) REMOVE AND REPLACE APPROXIMATELY 2' WIDE 1/4 TON GROUTED RIPRAP, MATCH EXISTING THICKNESS.
(50) CONSTRUCT 4" AC OVER 3" AGGREGATE BASE, CLASS 2.
(51) INSTALL 3" AGGREGATE BASE, CLASS 2.
(52) CONSTRUCT 6" THK. CONCRETE SLOPE PROTECTION PER DETAIL ON THIS SHEET.
(53) CONSTRUCT FENCE AND DOUBLE SWING GATE PER R.C.F.D. STD. M801.
(54) REMOVE EXISTING FENCE AND GATE.
(55) CONSTRUCT CUTOFF WALL PER DETAIL ON THIS SHEET.
(56) INSTALL SLOPE PROTECTION BARRIER PER APWA STD. PLAN 360.
(57) RECONSTRUCT EXISTING DRIVEWAY APPROACH.
(58) CONSTRUCT CUTOFF WALL PER DETAIL ON THIS SHEET.

0 10 20 40 60
SCALE:1"=20'

BENCH MARK
COUNTY OF RIVERSIDE BENCHMARK NO. "H-31"
COUNTY OF RIVERSIDE BENCHMARK - 3 1/4" ALUMINUM DISK MARKED H-31, LOCATED FLUSH AT THE SOUTH WEST CORNER OF BRIDGE ON TOP OF SIDEWALK NEAR FACE OF CURB LOCATED AT THE CROSSING OF PERRIS BLVD. AND RIV. CO. FLOOD CONTROL CHANNEL (PERRIS LATERAL "A"), 43 FT. WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE HANDRAIL (EDGE OF BRIDGE) MARKED B-102 D.W.R. IN TOP OF CONC. POST FLUSH W/ GROUND
ELEVATION = 1474.674' (NAVD 1929)

REV.	DESCRIPTION	APPR.	DATE	APPR.	DATE
	REVISIONS	ENGINEER		RCFC/	

DESIGNED BY: BW
DRAWN BY: ET
DATE DRAWN:

APPROVED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH.(714)521-4811 FAX(714)521-4173
HAIDOOK I. AGHAIAN Date: 11/18/14
RCE NO. 43293

REGISTERED PROFESSIONAL ENGINEER HAIDOOK I. AGHAIAN RCE NO. 43293 Exp. 3-31-16 CIVIL STATE OF CALIFORNIA

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: DATE: 1/20/15
APPROVED BY: DATE: 1/22/2015

CITY OF PERRIS
APPROVED BY:
CITY ENGINEER DATE: 12-15-14
RECOMMENDED DATE:

18 TRENCH AND SURFACE REPAIR DETAIL

CITY OF PERRIS FILE NO. P8-1013

PERRIS VALLEY MDP
LINE "A-B"
DETAILS

PROJECT NO. 4-0-00537
DRAWING NO. 4-1063
SHEET NO. 18 OF 18

Last Update:11/18/14
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REDLANDS AVE STORM DRAIN IMPROVEMENT PLANS

STREET IMPROVEMENT PLANS FOR
FIRST INDUSTRIAL REALTY–RIDER ST & REDLANDS AVE
CITY OF PERRIS–DPR. 19–00016

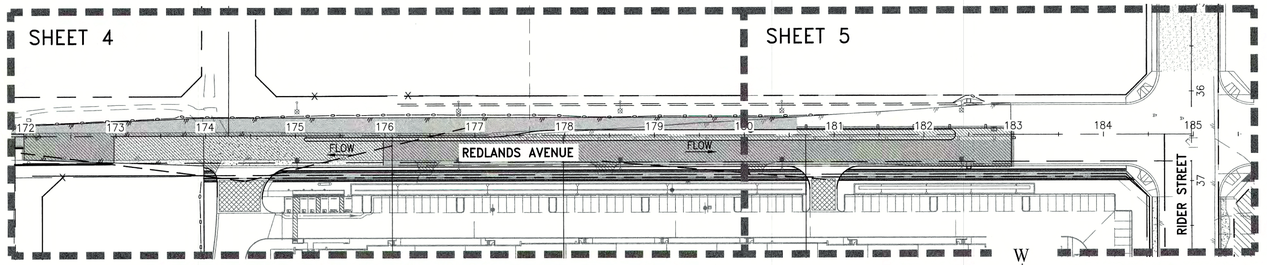
STREET NOTES

1. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER/OWNER CONTRACTOR TO APPLY TO THE CITY OF PERRIS ENGINEERING DEPARTMENT, PERMIT SECTION, FOR AN ENCROACHMENT PERMIT FOR ALL WORK PERFORMED WITHIN PUBLIC RIGHT–OF–WAY, DEDICATED AND ACCEPTED FOR PUBLIC USE; AND TO BE RESPONSIBLE FOR SATISFACTORY COMPLIANCE FOR ALL CURRENT ENVIRONMENTAL REGULATIONS DURING THE LIFE OF CONSTRUCTION ACTIVITIES FOR THIS PROJECT, ADDITIONAL STUDIES AND/OR PERMITS MAY BE REQUIRED.
2. THE CONTRACTOR/DEVELOPER SHALL BE RESPONSIBLE FOR THE CLEARING OF THE WORK AREA, AND RELOCATION COSTS OF ALL EXISTING UTILITIES. THIS INCLUDES UNDERGROUNDING OF EXISTING OVERHEAD LINES ALONG THE PROJECT FRONTAGE AS REQUIRED BY THE CONDITIONS OF APPROVAL. PERMITEE MUST INFORM CITY OF CONSTRUCTION SCHEDULE AT LEAST 48 HOURS PRIOR TO BEGINNING OF CONSTRUCTION. PHONE: (951) 943–6504.
3. THE DEVELOPER WILL INSTALL STREET NAME SIGNS CONFORMING TO COUNTY STANDARD NO. 816 OR AS APPROVED BY THE CITY ENGINEER.
4. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE RIVERSIDE COUNTY TRANSPORTATION DEPARTMENT IMPROVEMENT STANDARDS AND SPECIFICATIONS, LATEST EDITION, COUNTY ORDINANCE NO. 461 AND SUBSEQUENT AMENDMENTS.
5. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER TO NOTIFY THE ENGINEER TO INSTALL STREET CENTERLINE MONUMENTS AS REQUIRED BY RIVERSIDE COUNTY ORDINANCE NO. 461 (TRACTS AND PARCEL MAPS ONLY). ALL EXISTING SURVEY MONUMENTS SHALL BE PROTECTED IN PLACE OR RELOCATED BY A LICENSED PROFESSIONAL PRIOR TO CONSTRUCTION.
6. ALL UNDERGROUND FACILITIES, WITH LATERALS, SHALL BE IN PLACE PRIOR TO PAVING THE STREET, INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING: SEWER, WATER, ELECTRIC, GAS, STORM DRAINS.
7. CURB DEPRESSIONS AND DRIVEWAY APPROACHES WILL BE INSTALLED AND CONSTRUCTED ACCORDING TO COUNTY STANDARD NO. 207A, AS DIRECTED IN THE FIELD AND AS APPROVED BY THE CITY ENGINEER.
8. IT SHALL BE THE RESPONSIBILITY OF THE DEVELOPER OR CONTRACTOR TO INSTALL AND MAINTAIN ALL CONSTRUCTION, REGULATORY, GUIDE AND WARNING SIGNS WITHIN THE PROJECT LIMITS AND ITS SURROUNDINGS TO PROVIDE SAFE PASSAGE FOR THE TRAVELING PUBLIC AND WORKERS UNTIL THE FINAL COMPLETION AND ACCEPTANCE OF THE PROJECT BY THE CITY. A TRAFFIC CONTROL PLAN MUST BE SUBMITTED FOR REVIEW TO THE PERMITS SECTION OR INSPECTION SECTION PRIOR TO OBTAINING AN ENCROACHMENT PERMIT.
9. ALL STREET SECTIONS ARE MINIMUM REQUIREMENTS. ADDITIONAL SOIL TESTS SHALL BE TAKEN AFTER ROUGH GRADING TO DETERMINE THE RECOMMENDED STREET SECTION REQUIREMENTS. USE COUNTY STD. NO. 401 IF EXPANSIVE SOILS ARE ENCOUNTERED.
10. ASPHALTIC EMULSION (FOG SEAL) SHALL BE APPLIED NOT LESS THAN FOURTEEN DAYS FOLLOWING PLACEMENT OF THE ASPHALT SURFACING. FOG SEAL AND PAINT BINDER SHALL BE APPLIED AT A RATE OF 0.05 AND 0.03 GALLON PER SQUARE YARD RESPECTIVELY. ASPHALTIC EMULSION SHALL CONFORM TO SECTION 37, 39 AND 94 OF THE STATE STANDARD SPECIFICATIONS.
11. INSTALL STREET TREES IN ACCORDANCE WITH ORDINANCE NO. 461 AND THE COMPREHENSIVE LANDSCAPING GUIDELINES.
12. STREET LIGHTS SHALL BE INSTALLED PER RIVERSIDE COUNTY STANDARDS AND IN ACCORDANCE WITH THE APPROVED STREET LIGHTING PLAN.
13. AS DETERMINED BY THE CITY ENGINEER, THE DEVELOPER IS RESPONSIBLE AT A MINIMUM FOR ROAD IMPROVEMENTS TO CENTERLINE, AND MAY BE REQUIRED TO RECONSTRUCT EXISTING PAVEMENT, INCLUDING BASE, AND MATCHING OVERLAY REQUIRED TO MEET THE STRUCTURAL STANDARDS FOR THE CURRENT ASSIGNED TRAFFIC INDEX PER ENGINEERING CONDITION OF APPROVAL.
14. ANY PRIVATE DRAINAGE FACILITIES SHOWN ON THESE PLANS ARE FOR INFORMATION ONLY. BY SIGNING THESE IMPROVEMENT PLANS, NO REVIEW OR APPROVAL OF THOSE PRIVATE FACILITIES IS IMPLIED OR INTENDED BY THE CITY OF PERRIS ENGINEERING DEPARTMENT.
15. CONSTRUCTION PROJECTS MUST OBTAIN A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT. OWNERS/DEVELOPERS ARE REQUIRED TO FILE A NOTICE OF INTENT (NOI) WITH THE STATE WATER RESOURCES CONTROL BOARD (SWRCB), PREPARE A STORM WATER POLLUTION PREVENTION PLAN (SWPPP) AND MONITORING PLAN FOR THE SITE.
16. PRIOR TO ANY CONSTRUCTION, THE DEVELOPER SHALL PROVIDE THE CITY A COPY OF THE NOI WITH A VALID WDID NUMBER.
17. THE DEVELOPER SHALL BE RESPONSIBLE FOR THE INSTALLATION OF ADDITIONAL SIGNS AND MARKINGS NOT INCLUDED IN THE SIGNING AND STRIPING PLAN WITHIN THE PROJECT AREAS, OR ON ROADWAYS ADJACENT TO THE PROJECT BOUNDARIES, UPON THE REQUEST OF THE CITY ENGINEER OR HIS DESIGNEE TO IMPROVE TRAFFIC SAFETY ON THE ROADS UNDER THE JURISDICTION OF THE DEVELOPER.
18. EXISTING STORM DRAIN PIPES / CULVERTS (WHETHER TO BE CONNECTED TO, EXTENDED, ADJUSTED, DRAINED TO, OR JUST IN THE PROJECT VICINITY) MUST BE REPAIRED, AND/OR CLEANED TO MAKE THEM FUNCTIONAL AND ACCEPTABLE APPROVED BY THE CITY ENGINEER.
19. FOR ALL DRIVEWAY RECONSTRUCTION BEYOND RIGHT–OF–WAY, PROOF OF DRIVEWAY OWNER NOTIFICATION IS REQUIRED PRIOR TO CONSTRUCTION.
20. IN THE EVENT OF ANY DAMAGE TO ADJACENT STREETS CAUSED BY THE CONSTRUCTION, CONTRACTOR SHALL REMOVE AND REPLACE DAMAGES AS DIRECTED BY CITY ENGINEER.

NOTICE TO CONTRACTOR

1. CONTRACTOR AGREES THAT HE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND SHALL NOT BE LIMITED TO NORMAL WORKING HOURS. THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE CITY, OWNER AND ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF THE WORK ON THIS PROJECT, EXCEPTING LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER OR ENGINEER.
2. ALL UNDERGROUND UTILITIES OR STRUCTURES REPORTED OR FOUND IN PUBLIC RECORDS(MAINLINE, NO LATERALS OR SERVICES SHOWN), ARE INDICATED WITH THEIR APPROXIMATE LOCATION AND EXTENT. THE OWNER, BY ACCEPTING THESE PLANS OR PROCEEDING WITH THE IMPROVEMENTS HEREON, AGREES TO ASSUME LIABILITY AND HOLD THE ENGINEER HARMLESS FOR ANY DAMAGES RESULTING FROM THE EXISTENCE OF UNDERGROUND UTILITIES OR STRUCTURES NOT REPORTED OR INDICATED ON PUBLIC RECORDS, OR THOSE CONSTRUCTED IN VARIANCE WITH REPORTED OR RECORD LOCATIONS. THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO PROTECT THE UTILITIES OR STRUCTURES SHOWN AND ANY OTHER FOUND AT THE SITE. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO NOTIFY THE OWNERS OF ALL UTILITIES OR STRUCTURES CONCERNED BEFORE STARTING WORK.
3. THE ENGINEER PREPARING THESE PLANS SHALL NOT BE RESPONSIBLE OR LIABLE FOR ANY UNAUTHORIZED CHANGES TO OR USES OF THESE PLANS. ALL CHANGES TO THIS PLANS MUST BE REQUESTED IN WRITING AND MUST BE APPROVED BY THE ENGINEER OF RECORD.
4. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL DIMENSIONS AND CONDITIONS SHOWN HEREON AT THE JOB SITE PRIOR TO ANY CONSTRUCTION. SHOULD THERE BE ANY DISCREPANCY, THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT ONCE. REVISIONS AND/OR DEVIATIONS FROM THE PLAN SHALL BE APPROVED BY THE ENGINEER IN WRITING TO THE IMPLEMENTATION OF SUCH REVISION OR DEVIATION IN THE FIELD. BEGINNING OF CONSTRUCTION MEANS ACCEPTANCE OF THIS CONDITIONS.
5. CONTRACTOR SHALL NOTIFY "UNDERGROUND SERVICE ALERT" AT (800) 422–4133 AT LEAST TWO (2) WORKING DAYS PRIOR TO START OF WORK SO AS TO HAVE LOCATION OF UNDERGROUND UTILITIES LOCATED AND MARKED FOR CONSTRUCTION / SAFETY COORDINATION.
6. CONTRACTOR SHALL COMPLY WITH REQUIREMENTS OF FEDERAL STATE AND LOCAL LAWS AN REGULATIONS PERTAINING TO CLEAN AIR AND CLEAN WATER ACT.

NOTE: IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY ALL UTILITY COMPANIES OF ANY PROPOSED MODIFICATIONS AND RELOCATIONS BEING MADE TO THEIR FACILITIES. METHODS FOR MODIFICATIONS AND RELOCATIONS SHOULD BE DISCUSSED WITH THE UTILITY INSPECTOR PRIOR TO CONSTRUCTION.



INDEX MAP
1" = 80'

1" = 80'
80 0 80

W
S WEBB N
E

STREET IMPROVEMENT CONSTRUCTION NOTES AND QUANTITY ESTIMATE*

ITEM	DESCRIPTION	QUANTITY
1	CONSTRUCT MIN. 0.54' AC PAVEMENT OVER 1.17' CLASS II BASE (35,875 SF)	1,730 TON (AC) 2,420 TON (AB)
2	CONSTRUCT TYPE "A–8" CURB AND GUTTER PER RIV. CO. STD. 201	720 LF
3	CONSTRUCT CONCRETE CURB TYPE D (8" CF) PER RIV. CO. STD. 204	1,840 LF
4	CONSTRUCT MEDIAN PER RIV. CO. STD. 113	7,444 SF
5	CONSTRUCT LOCAL DEPRESSION PER RIV. CO. STD. 311 (SIZE PER PLAN)	1 EA
6	CONSTRUCT COMMERCIAL DRIVEWAY APPROACH PER RIV. CO. STD. 207A	2 EA
7	CONSTRUCT 12.5' WIDE WALKWAY AND BIKE PATH PER LANDSCAPE PLANS (7,420 SF)	134 TON (AC) 178 TON (AB)
8	REMOVE EXISTING PAVEMENT BY CONTRACTOR	37,180 SF
9	SAWCUT EXISTING PAVEMENT PER "OVERLAY JOIN DETAIL" ON SHEET 2	315 LF
10	GRIND 0.15' AND CONSTRUCT 0.15' MIN. AC OVERLAY TO JOIN EXISTING PER "OVERLAY JOIN DETAIL" ON SHEET 2	2,836 SF
11	RELOCATE POWER POLE PER SEPARATE PLAN	4 EA
12	ADJUST EXISTING VALVE, MANHOLE, OR STRUCTURE TO GRADE BY CONTRACTOR	2 EA
13	REMOVE OR RELOCATE EXISTING APPURTENANCES, ELECTRICAL STRUCTURES, OR STRUCTURES IN CONFLICT BY CONTRACTOR. CONTRACTOR TO COORDINATE RELOCATION WITH APPROPRIATE UTILITY PURVEYOR.	12 EA
14	PROTECT IN PLACE	12 EA
15	CONSTRUCT 1.0' CLASS II AB @ EP PER TYPICAL EDGE OF PAVEMENT DETAIL ON SHEET 2 (105 SF / 1,060 SF)	72 TON (AB)
16	PROPOSED LANDSCAPE PARKWAY PER LANDSCAPE PLANS	3,175 SF
17	CONSTRUCT MIN. 8" (4000 PSI) PCC OVER 16" CLASS II AB (C.J. @ 20' OC)	5,915 SF
18	CONSTRUCT MIN. 9" (4000 PSI) PCC OVER 16" CLASS II AB (C.J. @ 20' OC)	3,300 SF
19	CONSTRUCT CONCRETE TO AC PAVEMENT TRANSITION PER DETAIL SHEET 2	2 EA
20	INSTALL STREET LIGHT PER SEPARATE ELECTRICAL PLAN	4 EA
21	CONSTRUCT CATCH BASIN PER RCTD STD. DWG. NO. 300 (SIZE PER PLAN)	1 EA

*THE QUANTITY ESTIMATES SHOWN HEREON ARE FOR THE USE OF GOVERNING AGENCIES IN DETERMINING BOND AMOUNT AND/OR FEES AND ARE NOT TO BE USED FOR BID PURPOSES.

STORM DRAIN CONSTRUCTION NOTES AND QUANTITY ESTIMATE*

ITEM	DESCRIPTION	QUANTITY
1	CONSTRUCT 18" RCP (CLASS IV)	55 LF
2	CONSTRUCT 24" RCP (CLASS IV)	115 LF
3	CONSTRUCT MANHOLE #1 PER RCFC & WCD STD. DWG. NO. MH251	5 EA
4	CONSTRUCT CATCH BASIN PER RCTD STD. DWG. NO. 300 (SIZE PER PLAN)	1 EA
5	CONSTRUCT CONCRETE DROP INLET PER RCFC & WCD STD. DWG. NO. CB110	1 EA
6	CONSTRUCT INLET TYPE X PER RCFC & WCD STD. DWG. NO. CB108	1 EA
7	CONSTRUCT 30" RCP (CLASS IV)	192 LF
8	CONSTRUCT 36" RCP (CLASS IV)	1,075 LF
9	CONSTRUCT 8'W X 6'H RCB BOX PER CALTRANS STD. PLAN D80 (MAXIMUM EARTH COVER = 3') & JUNCTION STRUCTURE #1 PER RCFC & WCD STD. DWG. JS226 W/ SPECIAL EDGE BEAM PER JS#5 CASE BM8P6 AND DETAIL ON SHEET 3.	1 EA
10	PLACE SLURRY BACKFILL PER DETAIL ON SHEET 9	1,047 SF
11	CONSTRUCT TRANSITION STRUCTURE #3 PER RCFC & WCD STD. DWG. NO. TS303	1 EA
12	REMOVE AND DISPOSE OF EXISTING 24" RCP BY CONTRACTOR	56 LF
13	REMOVE EXISTING PRE–CAST 6'X8' RCB FROM STA. 36+63.02 TO 36+52.33	10 LF

*THE QUANTITY ESTIMATES SHOWN HEREON ARE FOR THE USE OF GOVERNING AGENCIES IN DETERMINING BOND AMOUNT AND/OR FEES AND ARE NOT TO BE USED FOR BID PURPOSES.

SOILS ENGINEER CERTIFICATE STATEMENT:

I, FERNANDO ARAGON OF ARAGON GEOTECHNICAL, A REGISTERED CIVIL ENGINEER, PRINCIPALLY DOING BUSINESS IN GEOTECHNICAL ENGINEERING AND/OR APPLIED SOIL MECHANICS, HEREBY CERTIFY THAT A SAMPLING STUDY OF THE SOIL CONDITIONS PREVALENT WITHIN THIS SITE WAS MADE BY ME OR UNDER MY DIRECTION. THESE STREET PLANS HAVE BEEN REVIEWED BY ME OR UNDER MY DIRECTION AND CONFORM TO THE RECOMMENDATIONS MADE IN OUR GEOTECHNICAL ENGINEERING INVESTIGATION REPORT FOR PROJECT NO. 4534–SFI, DATED AUGUST 9, 2019 AND UPDATED PAVEMENT LETTER FOR PROJECT NO. 4534–PV, DATED DECEMBER 7, 2021. TO THE BEST OF MY KNOWLEDGE, THE REFERENCED REPORT REPRESENTS THE MOST CURRENT AND COMPLETE INFORMATION RELATIVE TO THE PROPOSED GRADING OF THE SITE. IT IS THE PROFESSIONAL OPINION OF ARAGON GEOTECHNICAL, INC. THAT THE CONCLUSIONS AND RECOMMENDATIONS RENDERED IN OUR REPORT ARE APPROPRIATE AND APPLICABLE TO THIS PROJECT AND THEY ARE IN SUBSTANTIAL CONFORMANCE WITH ALL APPLICABLE CODE, ORDINANCE, AND STANDARDS OF PRACTICE FOR THE PROJECT PROPOSED.

LICENSED PROFESSIONAL ENGINEER CARLOS FERNANDO ARAGON C 72277 EXP. 06/30/24 CIVIL STATE OF CALIFORNIA

C. Fernando Aragon 72277 10/13/22
NAME R.C.E. NO. DATE STAMP

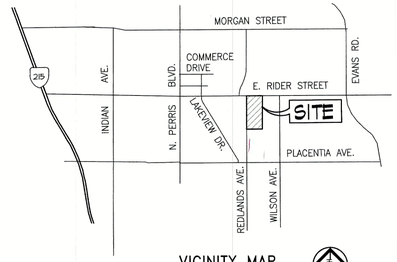
APPROXIMATE EARTHWORK QUANTITY ESTIMATE

CUT– 830 CU. YDS. FILL– 830 CU. YDS.
NET– 0 CU. YDS.

THE ABOVE QUANTITIES DO NOT REFLECT ANY SHRINKAGE, SWELLING, SUBSIDENCE, OVER EXCAVATION OR ANY SPECIAL CONDITIONS THAT MAY BE SPECIFIED IN THE PRELIMINARY SOILS REPORT AND ARE FOR REFERENCE AND FEE PURPOSES ONLY. SINCE THE ENGINEER CANNOT CONTROL THE EXACT METHOD OR MEANS USED BY THE CONTRACTOR DURING GRADING OPERATIONS, NOR CAN THE ENGINEER GUARANTEE THE EXACT SOIL CONDITION OVER THE ENTIRE SITE, THE ENGINEER ASSUMES NO RESPONSIBILITY FOR FINAL EARTHWORK QUANTITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING HIS OWN EARTHWORK QUANTITIES FOR BIDDING, CONTRACT, AND CONSTRUCTION PURPOSES. IF IT APPEARS THERE WILL BE AN EXCESS OR SHORTAGE OF MATERIAL, THE CONTRACTOR MAY NOTIFY THE ENGINEER TO DETERMINE IF POSSIBLE GRADE ADJUSTMENTS CAN BE MADE TO ALLEVIATE SAID MATERIAL EXCESS OR SHORTAGE.

SHEET INDEX

SHEET 1	TITLE SHEET
SHEET 2	SECTIONS & DETAILS
SHEET 3	DRIVEWAY DETAILS
SHEET 4 – 5	PLAN & PROFILE – REDLANDS AVENUE
SHEET 6 – 7	STREET CROSS SECTIONS
SHEET 8 – 10	STORM DRAIN IMPROVEMENT PLAN



VICINITY MAP
NOT TO SCALE

OWNER/APPLICANT
FIRST INDUSTRIAL REALTY TRUST
898 N PACIFIC COAST HWY, SUITE 175
EL SEGUNDO, CA 90245
ATT. MICHAEL GOODWIN
PH: (310) 606–1634

ENGINEER
ALBERT A. WEBB ASSOCIATES
3788 McCRAY STREET
RIVERSIDE, CA 92506
ATTN: JOSHUA LESINSKI
PH: (951) 686–1070
FAX: (951) 788–1256

SOILS ENGINEER
ARAGON GEOTECHNICAL
16801 VAN BUREN BLVD, BLDG B
RIVERSIDE, CA 92504
ATTN: C FERNANDO ARAGON
PH: (951) 776–0345

S.W.P.P.P. CONTACT
FIRST INDUSTRIAL REALTY TRUST
898 N PACIFIC COAST HWY, SUITE 175
EL SEGUNDO, CA 90245
ATT. MICHAEL GOODWIN
PH: (310) 606–1634

TOPOGRAPHY SOURCE
INLAND AERIAL SURVEYS, INC
7117 ARLINGTON AVENUE, SUITE A
RIVERSIDE, CALIFORNIA 92503
ATTN: DEREK HOOD
PH: (951) 687–4252
FAX: (951) 687–4120
DATED: JULY 17, 2019

A.P.N.'S
300–210–001, –002, –003, –004, –005

UTILITIES:
WATER: EASTERN MUNICIPAL WATER DISTRICT PHONE: (800) 426–3693
SEWER: EASTERN MUNICIPAL WATER DISTRICT PHONE: (800) 426–3693
ELECTRIC: SOUTHERN CALIFORNIA EDISON COMPANY PHONE: (800) 655–4555
TELEPHONE: CHARTER COMMUNICATIONS PHONE: (833) 694–8259
GAS: SOUTHERN CALIFORNIA GAS COMPANY PHONE: (800) 427–2200

BENCHMARK
USC & GS BENCHMARKS:

40Y (PID #DX2103) – 3" BRASS DISK, SET IN BOULDER.

STATION IS ABOUT 4–1/2 MILES W OF LAKEVIEW, ABOUT ONE MILE W OF THE PASS THROUGH THE BERNASCONI MOUNTAINS, ABOUT 200 FEET SW OF THE INTERSECTION OF BRADLEY ROAD AND WALNUT AVENUE, 70 FEET S OF CENTER LINE OF WALNUT AVENUE, IN A LARGE BOULDER, AND MARKED WITH A TEE. MARK IS A METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA STANDARD DISK STAMPED 40 Y 1931.

ELEV. = 1496.35, (NAVD 88)
NGVD88 – 2.52 = NAVD29

BASIS OF BEARINGS
"THE BASIS OF BEARINGS FOR THIS SURVEY IS THE CALIFORNIA STATE PLANE COORDINATE SYSTEM, CCS83, ZONE 6, BASED LOCALLY ON CONTROL STATIONS "MLFP", "PPBF", NAD 83 (NSRS2011) AS SHOWN HEREON. ALL BEARINGS SHOWN ON THIS MAP ARE GRID. QUOTED BEARINGS AND DISTANCES FROM REFERENCE MAPS OR DEEDS ARE AS SHOWN PER THAT RECORD REFERENCE. ALL DISTANCES FROM REFERENCE MAPS OR DEEDS ARE AS SHOWN PER THAT RECORD REFERENCE. ALL DISTANCES SHOWN ARE GROUND DISTANCES UNLESS SPECIFIED OTHERWISE. GRID DISTANCES, MAY BE OBTAINED BY MULTIPLYING THE GROUND DISTANCE BY A COMBINATION FACTOR OF 0.9999281329. CALCULATIONS MADE AT BASE STATION POINT 1 USING ELEVATION OF 1445.421, CONVERGENCE ANGLE IS –00°31'59"."

UNDERGROUND STRUCTURES
ALL UNDERGROUND STRUCTURES OR UTILITIES REPORTED BY THE OWNER OR OTHERS AND THOSE SHOWN ON THE RECORDS EXAMINED ARE INDICATED WITH THEIR APPROXIMATE LOCATION AND EXTENT.

THE OWNER, BY ACCEPTING THESE PLANS OR PROCEEDING WITH THE IMPROVEMENTS PURSUANT THERETO AGREES TO ASSUME LIABILITY AND TO HOLD THE UNDERSIGNED HARMLESS FOR ANY DAMAGES RESULTING FROM THE EXISTENCE OF UNDERGROUND UTILITIES OR STRUCTURES NOT REPORTED TO THE UNDERSIGNED, NOT INDICATED ON THE PUBLIC RECORDS EXAMINED, OR LOCATED AT VARIANCE WITH THAT REPORTED OR SHOWN ON THE RECORDS EXAMINED.

THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO PROTECT THE UTILITIES OR STRUCTURES SHOWN AND ANY OTHER UTILITIES OR STRUCTURES FOUND AT THE SITE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE OWNERS OF THE UTILITIES OR STRUCTURES CONCERNED BEFORE STARTING WORK.

EXISTING UTILITY POTHOLE NOTE:
EXISTING UNDERGROUND FACILITIES ARE SHOWN ON THE PLANS BASED ON THE BEST INFORMATION AVAILABLE. THE CONTRACTOR IS RESPONSIBLE FOR PERFORMING EXPLORATORY EXCAVATIONS (POTHOLING) ALONG THE ALIGNMENT OF THE PROJECT TO CONFIRM THE ELEVATION AND LOCATION OF ALL EXISTING FACILITIES INCLUDING SERVICE LATERALS AND TO ESTABLISH CONNECTION REQUIREMENTS TO EXISTING FACILITIES. THE CONTRACTOR SHALL PROVIDE THE POTHOLING INFORMATION TO THE ENGINEER OF RECORD A MINIMUM OF THREE WEEKS PRIOR TO CONSTRUCTION TO ALLOW DESIGN REVISIONS IF A CONFLICT ARISE. THE CONTRACTOR SHALL PROVIDE DETAILED SPREAD SHEET INCLUDING POTHOLE NUMBER, DESCRIPTION, LOCATION, STATION, OFFSIDE DISTANCE, DEPTH, AND TYPE OF MATERIAL. UPON LEARNING OF THE EXISTENCE OR LOCATION OF ANY FACILITY OMITTED FROM OR SHOWN INCORRECTLY ON CONSTRUCTION DRAWINGS, OR IMPROPERLY MARKED OR OTHERWISE INDICATED, CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF RECORD PROVIDING FULL DETAILS AS SPECIFIED HEREIN.

DECLARATION OF ENGINEER OF RECORD
I HEREBY DECLARE THAT THE DESIGN OF THE IMPROVEMENTS SHOWN ON THESE PLANS COMPLIES WITH ALL PROFESSIONAL ENGINEERING STANDARDS AND PRACTICES. AS THE ENGINEER OF RECORD FOR THE PLANS, I ASSUME FULL RESPONSIBILITY FOR THE DESIGN OF THE IMPROVEMENTS. WITH RESPECTS TO THE PLAN CHECK PERFORMED BY THE CITY OF PERRIS, I UNDERSTAND AND ACKNOWLEDGE THE FOLLOWING: (1) THE PLAN CHECK IS A REVIEW FOR THE LIMITED PURPOSE OF ENSURING THE PLANS COMPLY WITH THE CITY'S STANDARDS, PROCEDURES, POLICIES, AND ORDINANCES, (2) THE PLAN CHECK IS NOT A DETERMINATION OF THE TECHNICAL ADEQUACY OF THE DESIGN OF THE IMPROVEMENTS, AND (3) THE PLAN CHECK DOES NOT RELIEVE ME OF MY LEGAL AND PROFESSIONAL RESPONSIBILITY FOR THE DESIGN OF THE IMPROVEMENTS. AS THE ENGINEER OF RECORD, I AGREE TO DEFEND, INDEMNIFY, AND HOLD HARMLESS THE CITY, ITS ELECTED OFFICIALS, EMPLOYEES, AND AGENTS FROM ANY AND ALL ACTUAL OR ALLEGED CLAIMS, DEMANDS, CAUSES OF ACTION, LIABILITY, LOSS, DAMAGE, OR INJURY TO PROPERTY OR PERSON, INCLUDING WRONGFUL DEATH, WHETHER IMPOSED BY A COURT OF LAW OR BY ADMINISTRATIVE ACTION OF ANY FEDERAL, STATE, OR LOCAL GOVERNMENTAL AGENCY, ARISING OUT OF OR INCIDENT TO ANY NEGLIGENT ACTS, OMISSIONS, OR ERRORS BY THE ENGINEER OF RECORD, ITS EMPLOYEES, CONSULTANTS, OR AGENTS.

JOSHUA S. LESINSKI, R.C.E.# C92605 — 10/13/22 DATE

WDID# 8 33C395823

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MARK	BY	DATE	REVISIONS	APPR.	DATE
	ENGINEER			CITY	

CITY OF PERRIS
APPROVED BY:
CONTRACT CITY ENGINEER
10-24-2022
DATE

SEAL – ENGINEER
REGISTERED PROFESSIONAL ENGINEER JOSHUA S. LESINSKI NO. C92605 CIVIL STATE OF CALIFORNIA

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

PREPARED UNDER THE SUPERVISION OF: JOSHUA S. LESINSKI
DESIGNED BY: JSL CHECKED BY: TMG
R.C.E. NO.: C92605
10/13/22 DATE

BENCHMARK: SEE ABOVE

SCALE: H: 1" = 80' V: N/A

CITY OF PERRIS
DEVELOPMENT PLAN NO. 19–00016
FIRST INDUSTRIAL REALTY – RIDER STREET
STREET IMPROVEMENT PLAN – REDLANDS AVE
TITLE SHEET

FOR: FIRST INDUSTRIAL
W.O. 19–0137
CITY FILE NO. P8–1412A

SHEET NO. 1 OF 10 SHEETS

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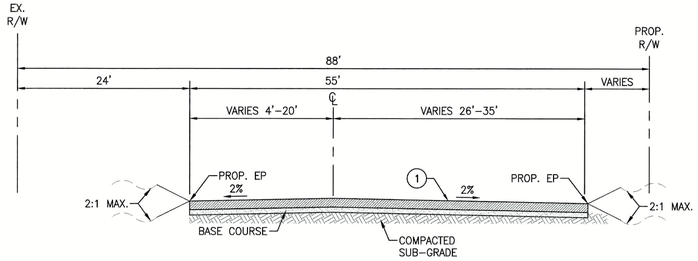
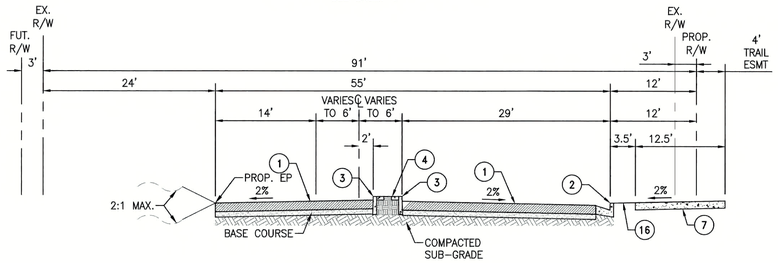
LEGEND & ABBREVIATIONS:

	PROPOSED 8" PCC
	PROPOSED 8" PCC
	PROPOSED AC PAVEMENT
	REMOVE EXISTING AC PAVING
	GRIND AND OVERLAY EXISTING AC PAVEMENT
(XX.XX)	EXISTING ELEVATION
1475	EXISTING CONTOURS

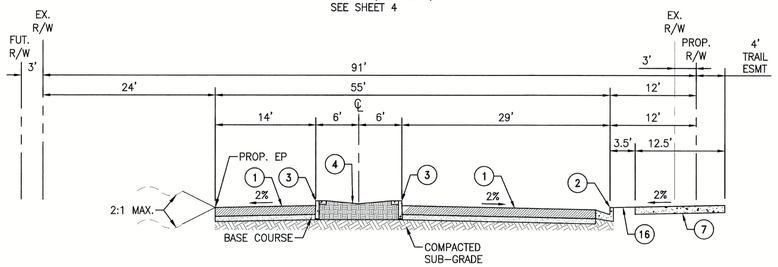
AP	ANGLE POINT
BCR	BEGIN CURB RETURN
CL, ℄	CENTERLINE
ECR	END CURB RETURN
EP	EDGE OF PAVEMENT
EX.	EXISTING
FG	FINISHED GRADE
FL	FLOW LINE
FS	FINISH SURFACE
GB	GRADE BREAK
HP	HIGH POINT
INV	INVERT
LP	LOW POINT
MAX	MAXIMUM
MIN	MINIMUM
MH	MANHOLE
PVI	POINT OF VERTICAL INTERSECTION
PL	PROPERTY LINE
RL	RIDGELINE
R/W	RIGHT OF WAY
STA	STATION
TC	TOP OF CURB
TG	TOP OF GRADE
TRANS.	TRANSITION
TYP	TYPICAL
UGE	UNDERGROUND ELECTRIC
VC	VERTICAL CURVE



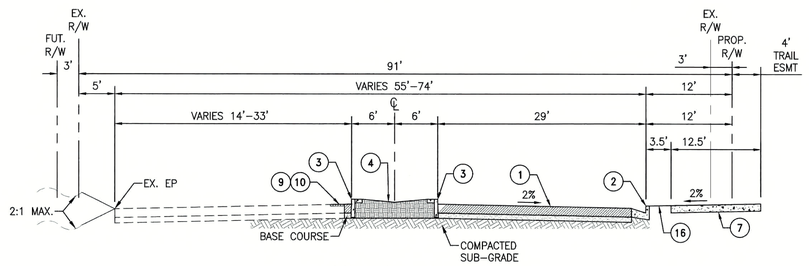
REDLANDS AVENUE
STA. 171+97.89 – 175+10.24
SECONDARY ARTERIAL; T.I.=10
PRELIMINARY R–VALUE=30, AC=0.54', AB=1.17'
SEE SHEET 4



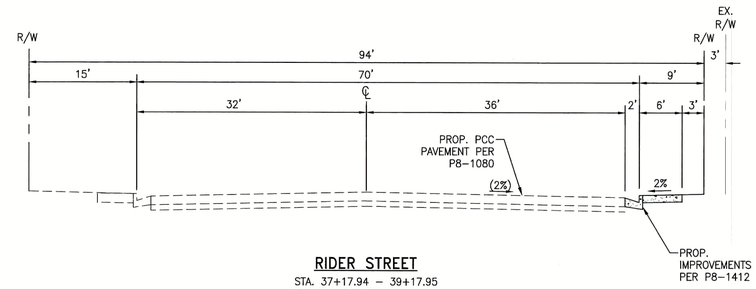
REDLANDS AVENUE
STA. 175+10.24 – 177+90.83
SECONDARY ARTERIAL; T.I.=10
PRELIMINARY R–VALUE=30, AC=0.54', AB=1.17'
SEE SHEET 4



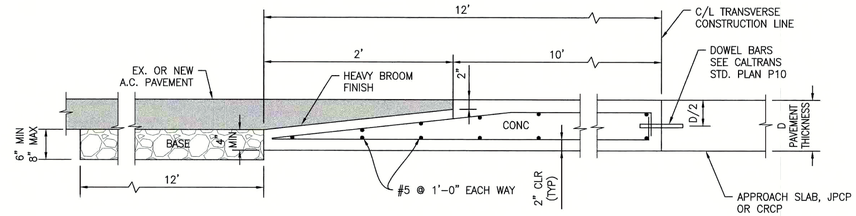
REDLANDS AVENUE
STA. 177+90.83 – 180+58.60
SECONDARY ARTERIAL; T.I.=10
PRELIMINARY R–VALUE=30, AC=0.54', AB=1.17'
SEE SHEETS 4 & 5



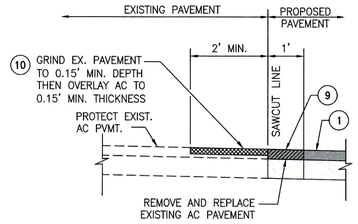
REDLANDS AVENUE
STA. 180+58.60 – 182+96.90
SECONDARY ARTERIAL; T.I.=10
PRELIMINARY R–VALUE=30, AC=0.54', AB=1.17'
SEE SHEET 5



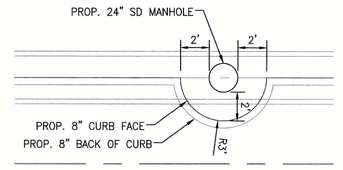
RIDER STREET
STA. 37+17.94 – 39+17.95
SECONDARY ARTERIAL; T.I.=10
PRELIMINARY R–VALUE=30, AC=0.54', AB=1.17'



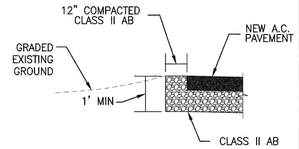
(19) CONCRETE PAVEMENT TO AC TRANSITION DETAIL
NTS



(9) (10) OVERLAY JOIN DETAIL
NTS



TYPICAL MEDIAN/MANHOLE CUT–OUT DETAIL
NTS



(15) TYP. EDGE OF PAVEMENT DETAIL
NTS

CONSTRUCTION NOTES

(1)	CONSTRUCT MIN. 0.54' AC PAVEMENT OVER 1.17' CLASS II BASE
(2)	CONSTRUCT TYPE "A–8" CURB AND GUTTER PER RIV. CO. STD. 201
(3)	CONSTRUCT CONCRETE CURB TYPE D (8" CF) PER RIV. CO. STD. 204
(4)	CONSTRUCT MEDIAN PER RIV. CO. STD. 113
(7)	CONSTRUCT 12.5' WIDE WALKWAY AND BIKE PATH PER LANDSCAPE PLANS
(9)	SAWCUT EXISTING PAVEMENT PER "OVERLAY JOIN DETAIL" ON SHEET 2
(10)	GRIND 0.15' AND CONSTRUCT 0.15' MIN. AC OVERLAY TO JOIN EXISTING PER "OVERLAY JOIN DETAIL" ON SHEET 2
(15)	CONSTRUCT 1.0' CLASS II AB @ EP PER TYPICAL EDGE OF PAVEMENT DETAIL ON SHEET 2
(16)	PROPOSED LANDSCAPE PARKWAY PER LANDSCAPE PLANS

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ENGINEER				CITY	

CITY OF PERRIS
APPROVED BY:
CONTRACT CITY ENGINEER
10-24-2022
DATE

SEAL – ENGINEER
REGISTERED PROFESSIONAL ENGINEER JOSHUA S. LESINSKI NO. C92605 CIVIL STATE OF CALIFORNIA

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PREPARED UNDER THE SUPERVISION OF:
JOSHUA S. LESINSKI
DESIGNED BY: JSL CHECKED BY: TMG
R.C.E. NO.: C92605
10/13/22
DATE

BENCHMARK:
SEE SHEET 1

SCALE:
H: N/A V: N/A

CITY OF PERRIS
DEVELOPMENT PLAN NO. 19–00016
FIRST INDUSTRIAL REALTY – RIDER STREET
STREET IMPROVEMENT PLAN – REDLANDS AVE
SECTIONS & DETAILS

SHEET NO. 2 OF 10 SHEETS

FOR: FIRST INDUSTRIAL
W.O. 19–0137
CITY FILE NO. P8–1412A

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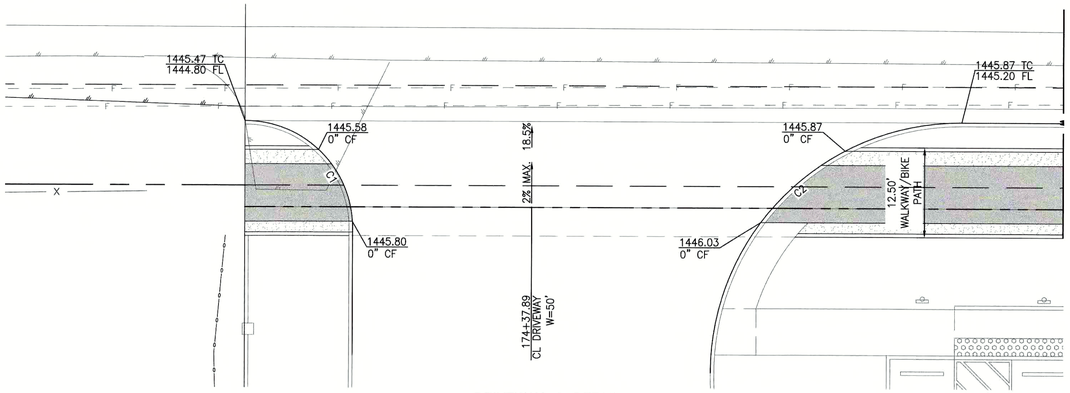
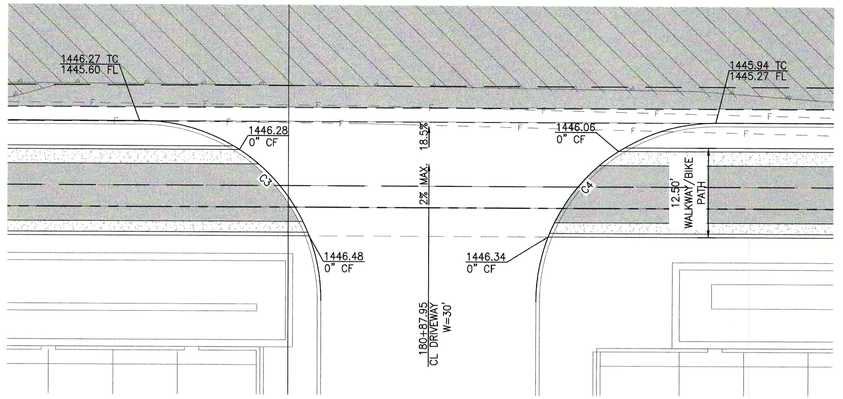


DRIVEWAY 1 DETAIL
REDLANDS AVE
1" = 10'



DRIVEWAY 2 DETAIL
REDLANDS AVE
1" = 10'

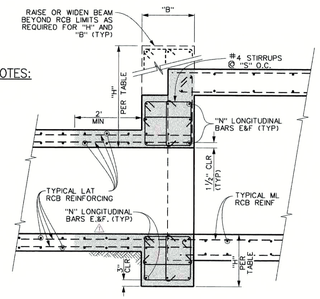
CURVE TABLE			
CURVE #	DELTA	RADIUS	LENGTH
C1	90°00'00"	15.00	23.56
C2	90°00'00"	35.00	54.98
C3	90°00'00"	25.00	39.27
C4	90°00'00"	25.00	39.27

CONSTRUCTION NOTES

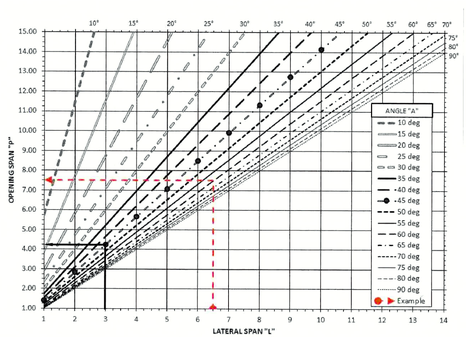
(12) REMOVE AND DISPOSE OF EXISTING 24" RCP BY CONTRACTOR

BM8P6 STRUCTURAL NOTES:

B= 12"
H= 14"
N= 2
S= 8"



N>1, WITHOUT "X" BARS
NTS



EQUATION
P = L / SIN (A)

"P" SPAN NOMOGRAPH

(12) EDGE BEAM DETAIL
JS #5 PER RCFC&WCD
NTS

WDID# 8 33C395823

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MARK	BY	DATE	REVISIONS	APPR.	DATE
	ENGINEER			CITY	

CITY OF PERRIS
APPROVED BY:
CONTRACT CITY ENGINEER
10-24-2022
DATE

SEAL – ENGINEER
REGISTERED PROFESSIONAL ENGINEER JOSHUA S. LESINSKI NO. C92605 CIVIL STATE OF CALIFORNIA

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

PREPARED UNDER THE SUPERVISION OF:
JOSHUA S. LESINSKI
DESIGNED BY: JSL CHECKED BY: TMG
R.C.E. NO.: C92605
10/13/22
DATE

BENCHMARK:
SEE SHEET 1

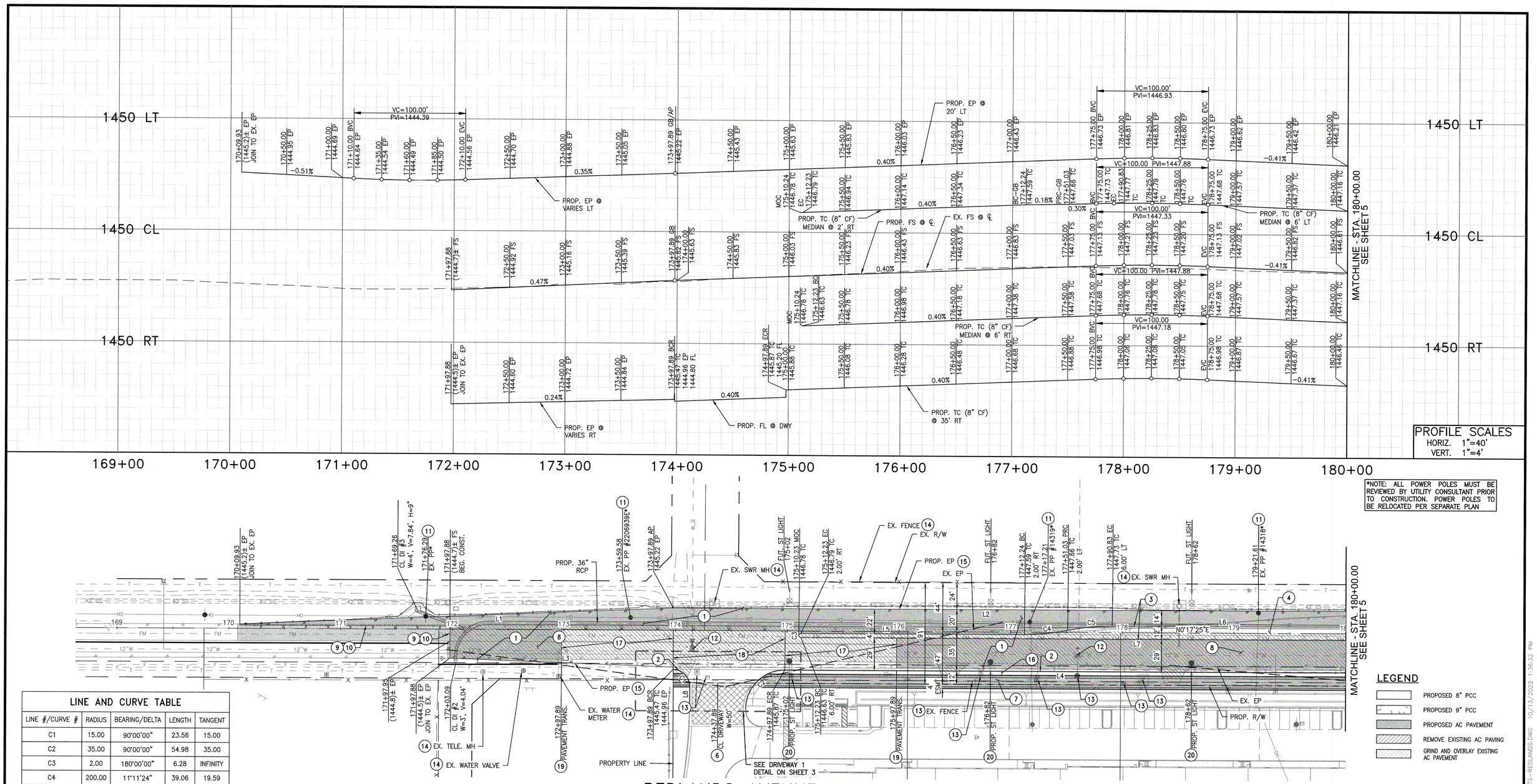
SCALE:
H: 1" = 10' V: N/A

CITY OF PERRIS
DEVELOPMENT PLAN NO. 19-00016
FIRST INDUSTRIAL REALTY – RIDER STREET
STREET IMPROVEMENT PLAN – REDLANDS AVE
DRIVEWAY DETAILS

SHEET NO. 3
OF 10 SHEETS

FOR: FIRST INDUSTRIAL
W.O. 19-0137
CITY FILE NO. P8-1412A

H:\2019\19-0137\DRAWINGS\PLAN SHEETS\ST\19-0137-C-ST SHEETS-REDLANDS.DWG 10/13/2022 1:36:32 PM



*NOTE: ALL POWER POLES MUST BE REVIEWED BY UTILITY CONSULTANT PRIOR TO CONSTRUCTION. POWER POLES TO BE RELOCATED PER SEPARATE PLAN

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

LINE AND CURVE TABLE				
LINE #/CURVE #	RADIUS	BEARING/DELTA	LENGTH	TANGENT
C1	15.00	90°00'00"	23.56	15.00
C2	35.00	90°00'00"	54.98	35.00
C3	2.00	180°00'00"	6.28	INFINITY
C4	200.00	11°11'24"	39.06	19.59
C5	200.00	11°28'49"	40.07	20.10
L1		S02°04'36"E	388.29	
L2		S00°17'25"W	602.12	
L3		N02°17'41"E	200.11	
L4		S00°17'25"W	502.11	
L5		N00°17'25"E	200.00	
L6		N00°17'25"E	209.17	
L7		S00°17'25"W	487.77	
L8		S89°42'35"E	17.54	

CONSTRUCTION NOTES

1. CONSTRUCT MIN. 0.54' AC PAVEMENT OVER 1.17' CLASS II BASE
2. CONSTRUCT TYPE "A-8" CURB AND GUTTER PER RIV. CO. STD. 201
3. CONSTRUCT CONCRETE CURB TYPE D (8" CF) PER RIV. CO. STD. 204
4. CONSTRUCT MEDIAN PER RIV. CO. STD. 113
6. CONSTRUCT COMMERCIAL DRIVEWAY APPROACH PER RIV. CO. STD. 207A
7. CONSTRUCT 12.5' WIDE WALKWAY AND BIKE PATH PER LANDSCAPE PLANS
8. REMOVE EXISTING PAVEMENT BY CONTRACTOR
9. SAWCUT EXISTING PAVEMENT PER "OVERLAY JOIN DETAIL" ON SHEET 2
10. GRIND 0.15' AND CONSTRUCT 0.15' MIN. AC OVERLAY TO JOIN EXISTING PER "OVERLAY JOIN DETAIL" ON SHEET 2
11. RELOCATE POWER POLE PER SEPARATE PLAN
12. ADJUST EXISTING VALVE, MANHOLE, OR STRUCTURE TO GRADE BY CONTRACTOR
13. REMOVE OR RELOCATE EXISTING APPURTENANCES, ELECTRICAL STRUCTURES, OR STRUCTURES IN CONFLICT BY CONTRACTOR. CONTRACTOR TO COORDINATE RELOCATION WITH APPROPRIATE UTILITY PURVEYOR.
14. PROTECT IN PLACE
15. CONSTRUCT 1.0' CLASS II AB @ EP PER TYPICAL EDGE OF PAVEMENT DETAIL ON SHEET 2
16. PROPOSED LANDSCAPE PARKWAY PER LANDSCAPE PLANS
17. CONSTRUCT MIN. 8" (4000 PSI) PCC OVER 16" CLASS II AB (C.J. @ 20' OC)
18. CONSTRUCT MIN. 9" (4000 PSI) PCC OVER 16" CLASS II AB (C.J. @ 20' OC)
19. CONSTRUCT CONCRETE TO AC PAVEMENT TRANSITION PER DETAIL SHEET 2
20. INSTALL STREET LIGHT PER SEPARATE ELECTRICAL PLAN

LEGEND

- PROPOSED 8" PCC
- PROPOSED 9" PCC
- PROPOSED AC PAVEMENT
- REMOVE EXISTING AC PAVING
- GRIND AND OVERLAY EXISTING AC PAVEMENT

1" = 40'
40 0 40 80 120

WDID# 8 33C395823

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	ENGINEER			CITY	

CITY OF PERRIS
APPROVED BY:
CONTRACT CITY ENGINEER
10-24-2022
DATE

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REGISTERED PROFESSIONAL ENGINEER JOSHUA S. LESINSKI NO. C92605 CIVIL STATE OF CALIFORNIA

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PREPARED UNDER THE SUPERVISION OF:
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DESIGNED BY: JSL CHECKED BY: TMG
R.C.E. NO.: C92605
10/13/22
DATE

BENCHMARK:
SEE SHEET 1

SCALE:
H: 1" = 40' V: 1" = 4'

CITY OF PERRIS
DEVELOPMENT PLAN NO. 19-00016
FIRST INDUSTRIAL REALTY – RIDER STREET
STREET IMPROVEMENT PLAN – REDLANDS AVE
REDLANDS AVE STA 171+97.89 – 180+00.00

SHEET NO. 4 OF 10 SHEETS

FOR: FIRST INDUSTRIAL
W.O. 19-0137
CITY FILE NO. P8-1412A

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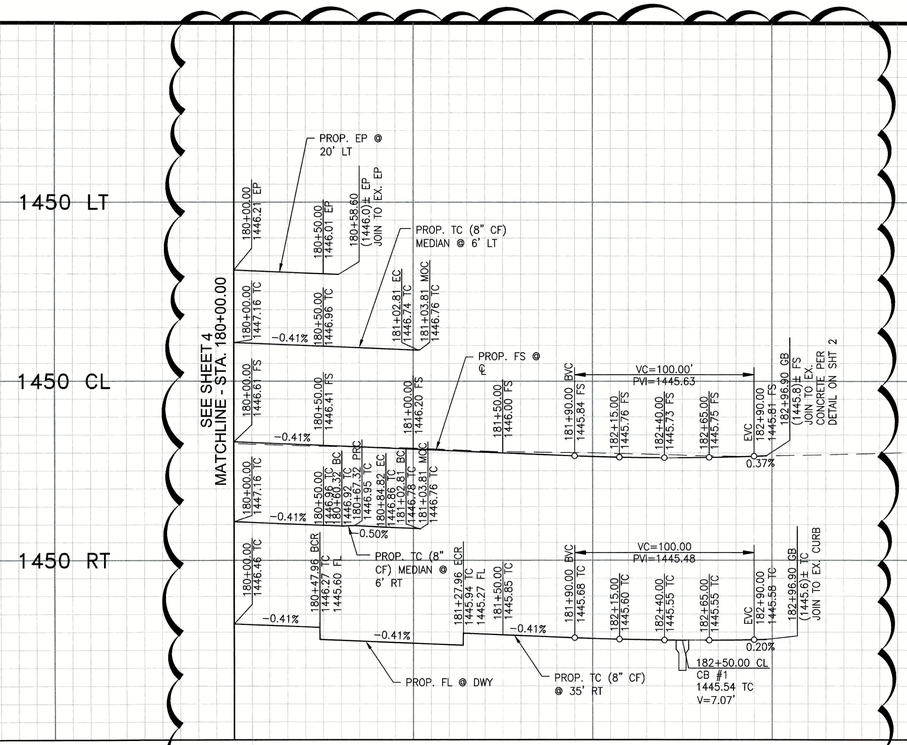

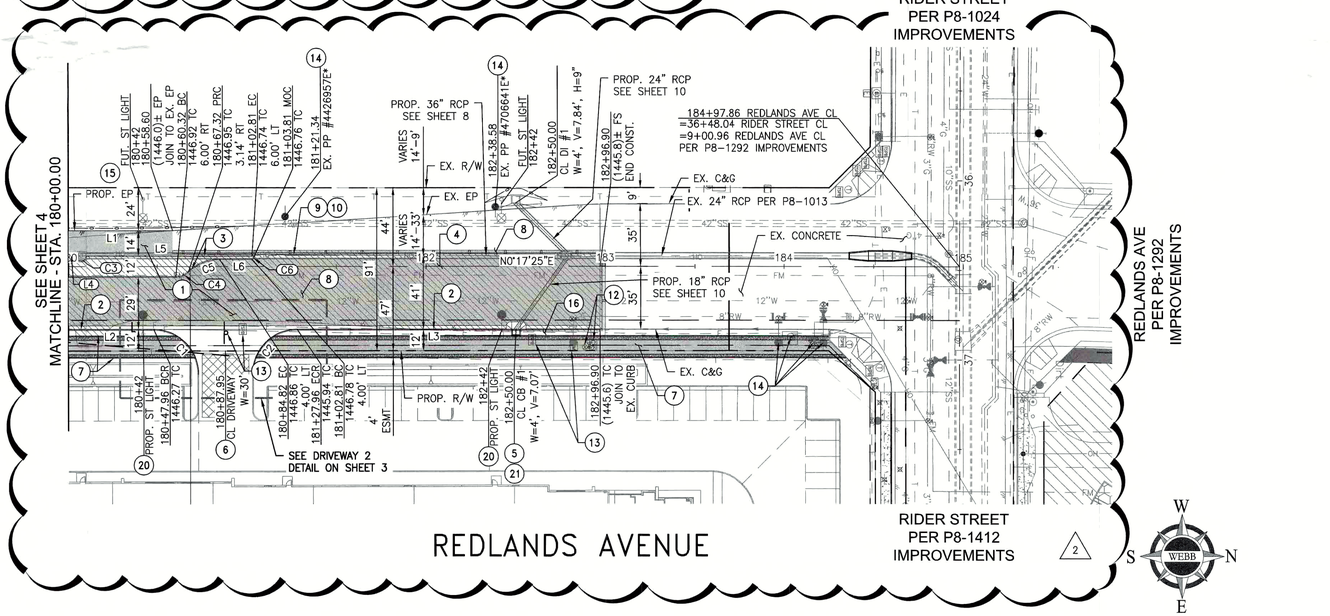

LINE AND CURVE TABLE				
LINE #/CURVE #	RADIUS	BEARING/DELTA	LENGTH	TANGENT
C1	25.00	90°00'00"	39.27	25.00
C2	25.00	90°00'00"	39.27	25.00
C3	3.00	180°00'00"	9.42	INFINITY
C4	10.00	44°24'55"	7.75	4.08
C5	25.00	44°24'55"	19.38	10.21
C6	1.00	179°58'15"	3.14	3939.39
L1		S00°17'25"W	58.60	
L2		S00°17'25"W	47.96	
L3		S00°17'25"W	169.07	
L4		N00°17'25"E	4.09	
L5		N00°17'25"E	1237.88	
L6		N00°17'25"E	18.00	

LEGEND

- PROPOSED 8" PCC
- PROPOSED 9" PCC
- PROPOSED AC PAVEMENT
- REMOVE EXISTING AC PAVING
- GRIND AND OVERLAY EXISTING AC PAVEMENT

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

*NOTE: ALL POWER POLES MUST BE REVIEWED BY UTILITY CONSULTANT PRIOR TO CONSTRUCTION. POWER POLES TO BE RELOCATED PER SEPARATE PLAN

CONSTRUCTION NOTES

1. CONSTRUCT MIN. 0.54' AC PAVEMENT OVER 1.17' CLASS II BASE
2. CONSTRUCT TYPE "A-8" CURB AND GUTTER PER RIV. CO. STD. 201
3. CONSTRUCT CONCRETE CURB TYPE D (8" CF) PER RIV. CO. STD. 204
4. CONSTRUCT MEDIAN PER RIV. CO. STD. 113
5. CONSTRUCT LOCAL DEPRESSION PER RIV. CO. STD. 311 (SIZE PER PLAN)
6. CONSTRUCT COMMERCIAL DRIVEWAY APPROACH PER RIV. CO. STD. 207A
7. CONSTRUCT 12.5' WIDE WALKWAY AND BIKE PATH PER LANDSCAPE PLANS
8. REMOVE EXISTING PAVEMENT BY CONTRACTOR
9. SAWCUT EXISTING PAVEMENT PER "OVERLAY JOIN DETAIL" ON SHEET 2
10. GRIND 0.15' AND CONSTRUCT 0.15' MIN. AC OVERLAY TO JOIN EXISTING PER "OVERLAY JOIN DETAIL" ON SHEET 2
12. ADJUST EXISTING VALVE, MANHOLE, OR STRUCTURE TO GRADE BY CONTRACTOR
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14. PROTECT IN PLACE
15. CONSTRUCT 1.0' CLASS II AB @ EP PER TYPICAL EDGE OF PAVEMENT DETAIL ON SHEET 2
16. PROPOSED LANDSCAPE PARKWAY PER LANDSCAPE PLANS
20. INSTALL STREET LIGHT PER SEPARATE ELECTRICAL PLAN
21. CONSTRUCT CATCH BASIN PER RCTD STD. DWG. NO. 300 (SIZE PER PLAN)

1" = 40'
40 0 40 80 120

WDID# 8 33C395823

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MARK	BY	DATE	REVISIONS	APPR.	DATE
2	MN	03/23	RVSD MEDIAN AND PROFILE VIEW		
	ENGINEER			CITY	

CITY OF PERRIS
APPROVED BY:
CONTRACT CITY ENGINEER
4/5/2023
DATE

SEAL – ENGINEER
REGISTERED PROFESSIONAL ENGINEER JOSHUA S. LESINSKI NO. C92605 CIVIL STATE OF CALIFORNIA

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DESIGNED BY: JSL CHECKED BY: TMG
R.C.E. NO.: C92605
3/22/23
DATE

BENCHMARK:
SEE SHEET 1

SCALE:
H: 1" = 40' V: 1" = 4'

CITY OF PERRIS
DEVELOPMENT PLAN NO. 19-00016
FIRST INDUSTRIAL REALTY – RIDER STREET
STREET IMPROVEMENT PLAN – REDLANDS AVE
REDLANDS AVE STA 180+00.00 – 182+96.90

SHEET NO. 5 OF 10 SHEETS

FOR: FIRST INDUSTRIAL
W.O. 19-0137
CITY FILE NO. P8-1412A

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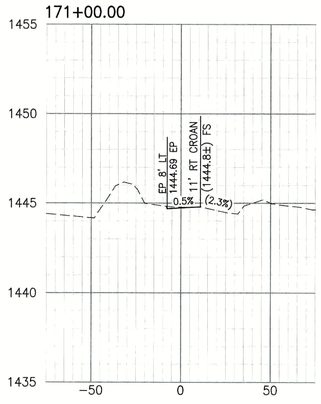

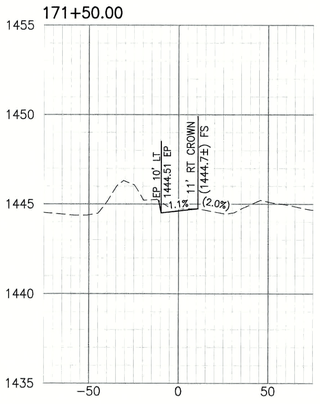

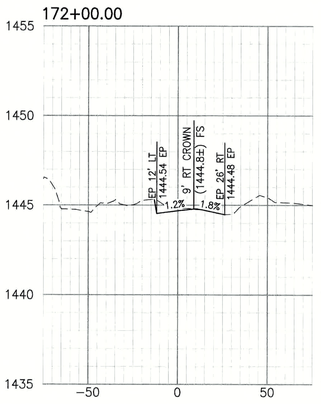

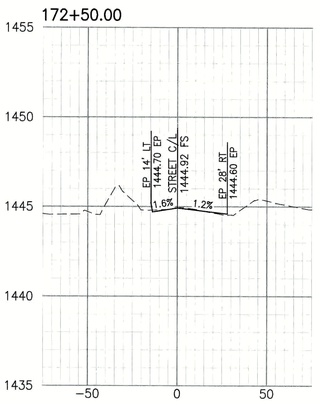

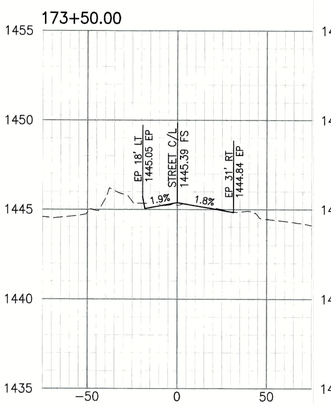

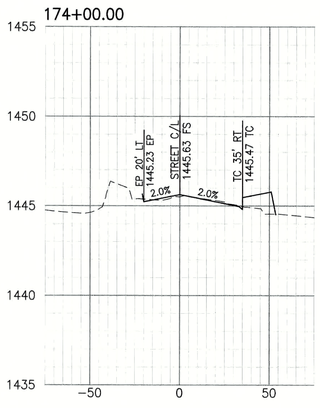

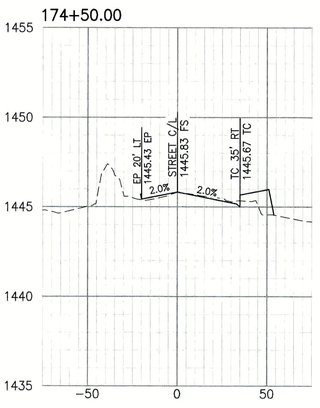

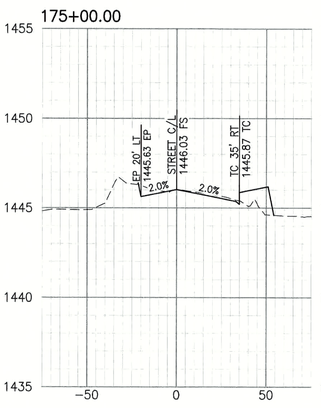

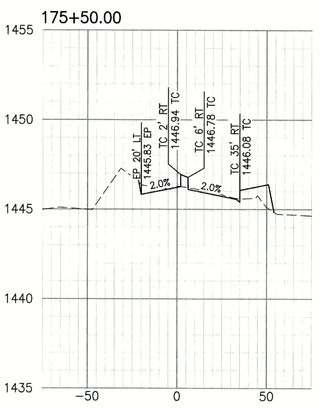

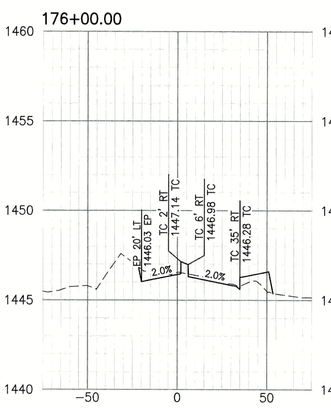

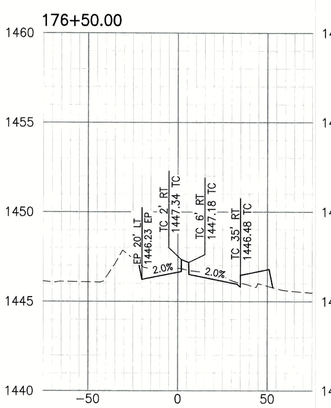

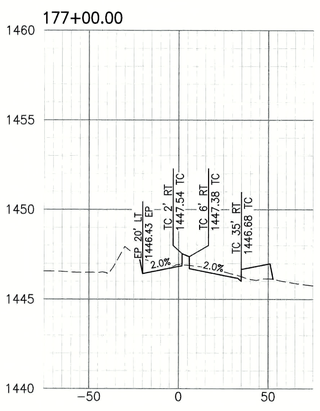

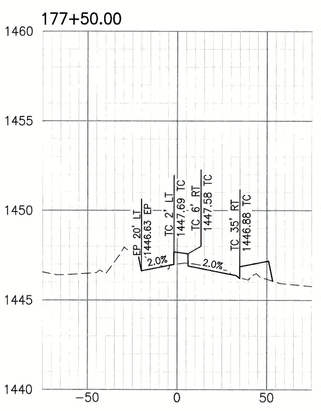

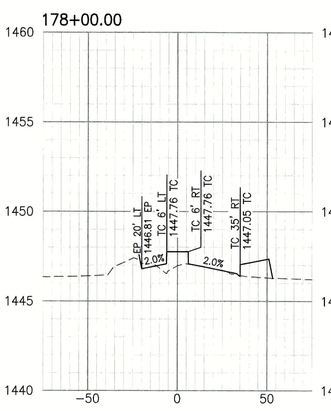

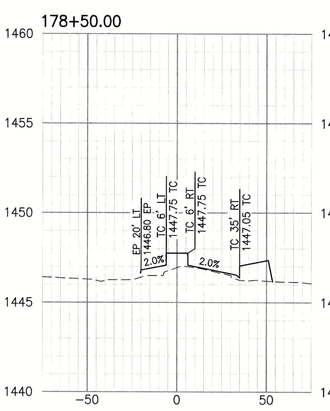

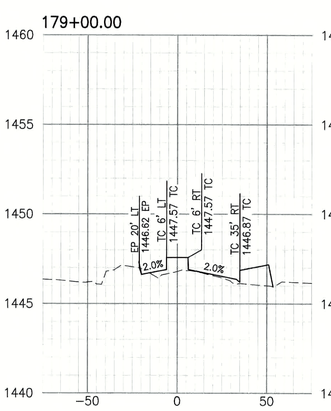

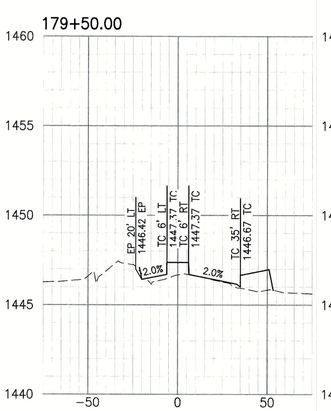

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	ENGINEER			CITY	

CITY OF PERRIS

APPROVED BY:

Stuart E. McKibbin

CONTRACT CITY ENGINEER

10-24-2022

DATE

SEAL – ENGINEER

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JOSHUA S. LESINSKI

DESIGNED BY: JSL CHECKED BY: TMG

R.C.E. NO.: C92605

10/13/22

DATE

BENCHMARK:

SEE SHEET 1

SCALE:

H: 1" = 40' V: 1" = 4'

CITY OF PERRIS

DEVELOPMENT PLAN NO. 19-00016

FIRST INDUSTRIAL REALTY – RIDER STREET

STREET IMPROVEMENT PLAN – REDLANDS AVE

REDLANDS AVE CROSS SECTIONS

SHEET NO. 6 OF 10 SHEETS

FOR: FIRST INDUSTRIAL

W.O. 19-0137

CITY FILE NO. P8-1412A

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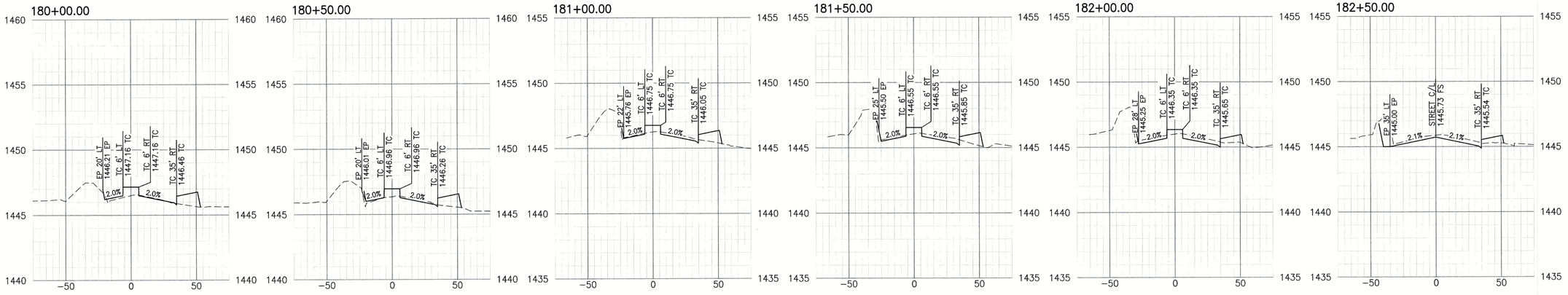

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ENGINEER				CITY	

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DATE

BENCHMARK:
SEE SHEET 1

SCALE:
H: 1" = 40' V: 1" = 4'

CITY OF PERRIS
DEVELOPMENT PLAN NO. 19-00016
FIRST INDUSTRIAL REALTY – RIDER STREET
STREET IMPROVEMENT PLAN – REDLANDS AVE
REDLANDS AVE CROSS SECTIONS

SHEET NO. 7 OF 10 SHEETS

FOR: FIRST INDUSTRIAL
W.O. 19-0137
CITY FILE NO. P8-1412A

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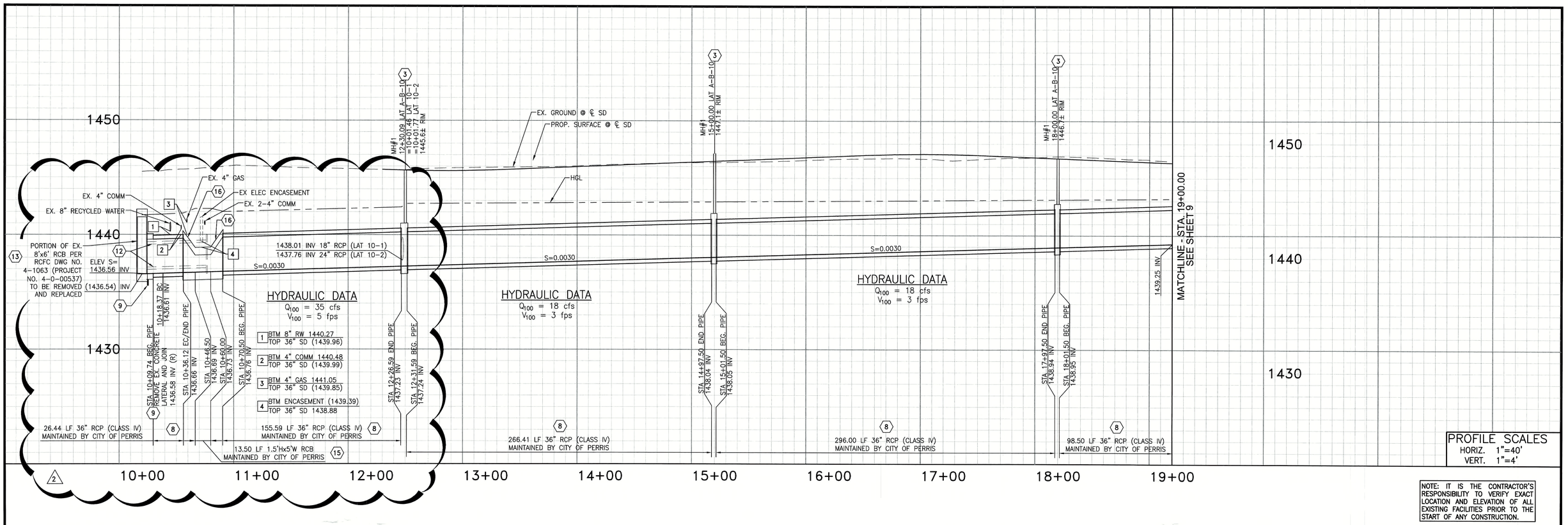
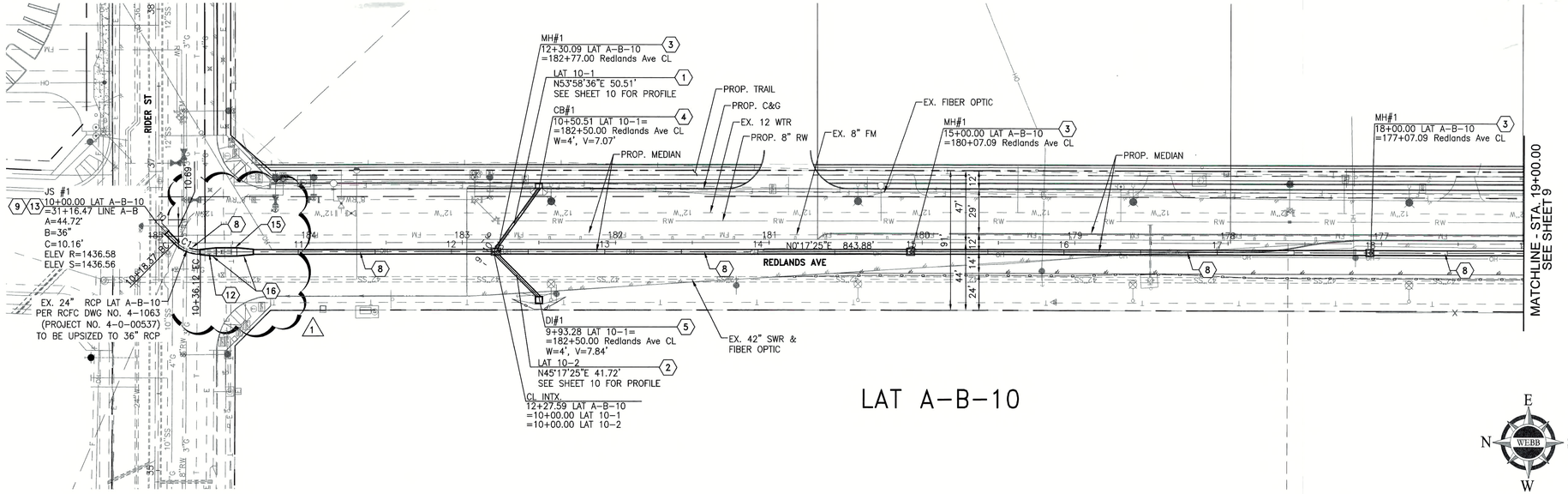


PROFILE SCALES
HORIZ. 1"=40'
VERT. 1"=4'

NOTE: IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY EXACT LOCATION AND ELEVATION OF ALL EXISTING FACILITIES PRIOR TO THE START OF ANY CONSTRUCTION.

NOTE 1: THE CONTRACTOR SHALL EXPOSE INNER AND OUTER REINFORCMENT OF ADJACENT PRE-CAST STRUCTURES TO TIE INTO CAST-IN-PLACE BOX. A MINIMUM OF TWO CROSS WIRES SHALL BE EXPOSED ON ALL SIDES. REFERENCE 'PRECAST RCB TERMINOLOGY' DETAIL IN CALTRANS STANDARD PLAN D83B FOR EXAMPLE OF CROSS WIRES.



LAT A-B-10

1" = 40'
40 0 40 80 120

CONSTRUCTION NOTES

1. CONSTRUCT 18" RCP (CLASS IV)
2. CONSTRUCT 24" RCP (CLASS IV)
3. CONSTRUCT MANHOLE #1 PER RCFC & WCD STD. DWG. NO. MH251
4. CONSTRUCT CATCH BASIN PER RCTD STD. DWG. NO. 300 (SIZE PER PLAN)
5. CONSTRUCT CONCRETE DROP INLET PER RCFC & WCD STD. DWG. NO. CB110
8. CONSTRUCT 36" RCP (CLASS IV)
9. CONSTRUCT 8'W X 6'H RCB BOX PER CALTRANS STD. PLAN D80 (MAXIMUM EARTH COVER = 3') & JUNCTION STRUCTURE #1 PER RCFC & WCD STD. DWG. JS226 W/ SPECIAL EDGE BEAM PER JS#5 CASE BM8P6 AND DETAIL ON SHEET 3. (SEE NOTE 1)
12. REMOVE AND DISPOSE OF EXISTING 24" RCP BY CONTRACTOR
13. REMOVE EXISTING PRE-CAST 6'X8' RCB FROM STA. 36+63.02 TO 36+52.33
15. CONSTRUCT 1.5'W X 5'H RCB BOX PER CALTRANS STD. PLAN D80
16. CONSTRUCT TRANSITION STRUCTURE #1 PER RCFC & WCD STD. DWG. NO. TS301

CURVE TABLE

CURVE #	DELTA	RADIUS	LENGTH	TANGENT
C1	45°11'56"	22.50	17.75	9.37

WDID# 8 33C395823

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NOTE:
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MARK	BY	DATE	REVISIONS	APPR.	DATE
2	EA	3/7/22	ADDED PORTION OF RCB FOR EXISTING ENCASEMENT CROSSING	JP	4/5/23
	ENGINEER				CITY

CITY OF PERRIS
APPROVED BY:
CONTRACT CITY ENGINEER
4/5/2023
DATE

SEAL – ENGINEER
REGISTERED PROFESSIONAL ENGINEER JOSHUA S. LESINSKI NO. C92605 CIVIL STATE OF CALIFORNIA

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

PREPARED UNDER THE SUPERVISION OF:
JOSHUA S. LESINSKI
DESIGNED BY: JSL CHECKED BY: TMG
R.C.E. NO.: C92605
3/22/23
DATE

BENCHMARK:
SEE SHEET 1

SCALE:
H: 1" = 40' V: 1" = 4'

CITY OF PERRIS
DEVELOPMENT PLAN NO. 19-00016
FIRST INDUSTRIAL REALTY – RIDER STREET
STORM DRAIN IMPROVEMENT PLAN – REDLANDS AVE
LATERAL A-B-10 STA 10+00.00 – 19+00.00

FOR: FIRST INDUSTRIAL
W.O. 19-0137
CITY FILE NO. P8-1412A

SHEET NO. 8 OF 10 SHEETS

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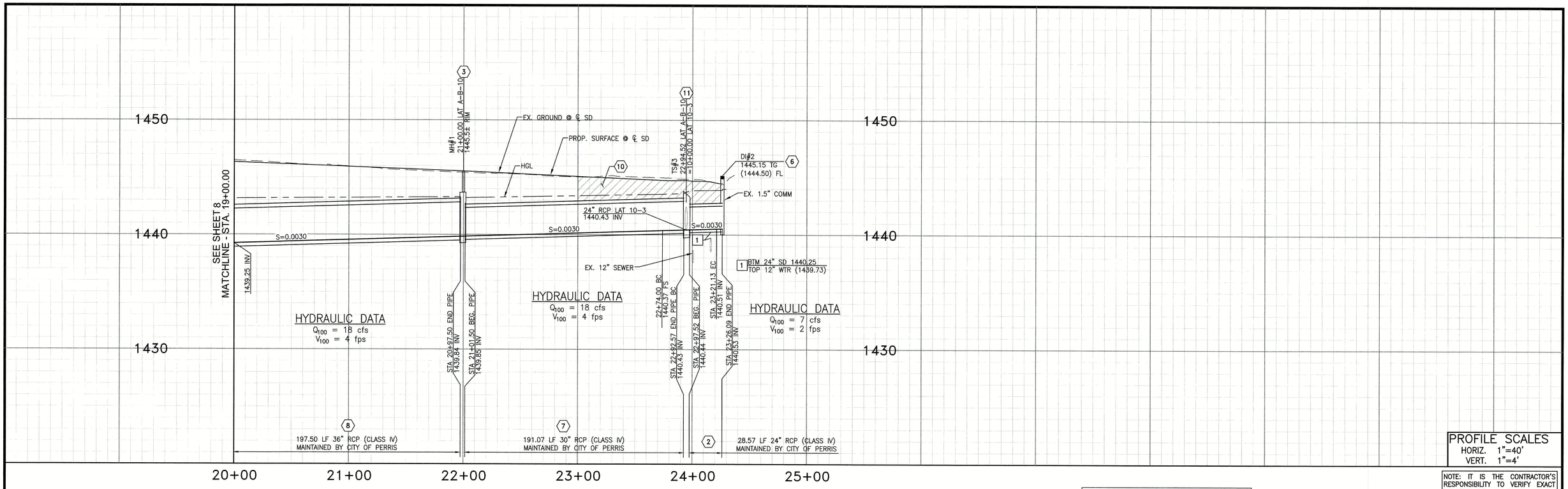
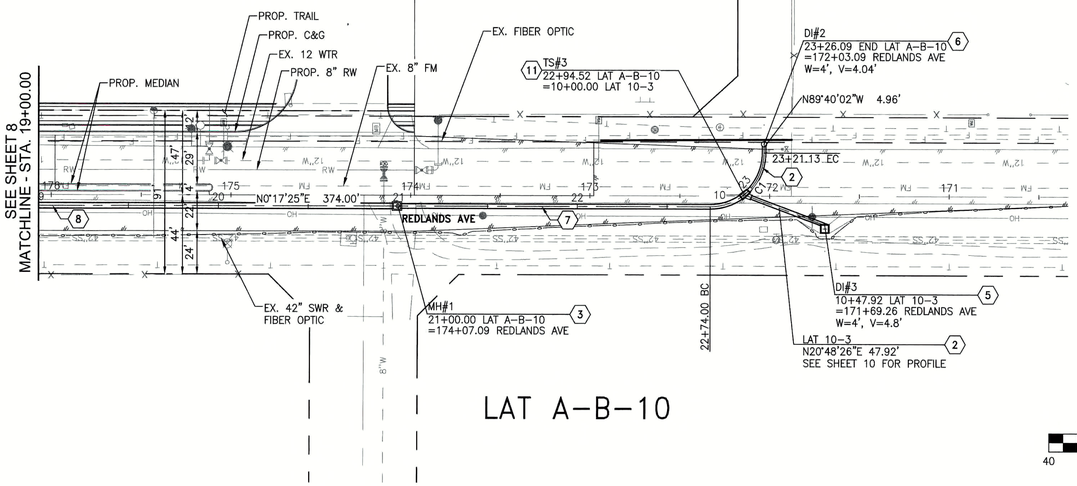


PROFILE SCALES
HORIZ. 1"=40'
VERT. 1"=4'

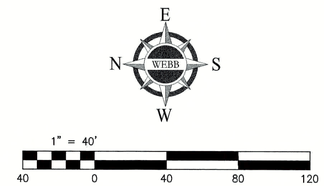
NOTE: IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY EXACT LOCATION AND ELEVATION OF ALL EXISTING FACILITIES PRIOR TO THE START OF ANY CONSTRUCTION.

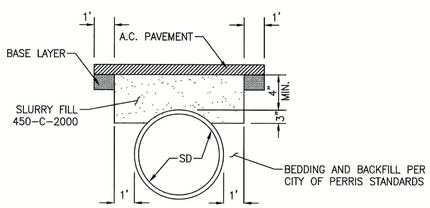
CURVE TABLE				
CURVE #	DELTA	RADIUS	LENGTH	TANGENT
C1	90°00'00"	30.00	47.12	30.00



CONSTRUCTION NOTES

2. CONSTRUCT 24" RCP (CLASS IV)
3. CONSTRUCT MANHOLE #1 PER RCFC & WCD STD. DWG. NO. MH251
5. CONSTRUCT CONCRETE DROP INLET PER RCFC & WCD STD. DWG. NO. CB110
6. CONSTRUCT INLET TYPE X PER RCFC & WCD STD. DWG. NO. CB108
7. CONSTRUCT 30" RCP (CLASS IV)
8. CONSTRUCT 36" RCP (CLASS IV)
10. PLACE SLURRY BACKFILL PER DETAIL ON SHEET 9
11. CONSTRUCT TRANSITION STRUCTURE #3 PER RCFC & WCD STD. DWG. NO. TS303





10 SLURRY FILL CROSS SECTION
NTS

WDID# 8 33C395823

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MARK	BY	DATE	REVISIONS	APPR.	DATE
	ENGINEER			CITY	

CITY OF PERRIS
APPROVED BY:
CONTRACT CITY ENGINEER
10-24-2022
DATE

SEAL – ENGINEER
REGISTERED PROFESSIONAL ENGINEER
JOSHUA S. LESINSKI
NO. C92605
CIVIL
STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
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3788 McCRAY STREET
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FAX (951) 788-1256

PREPARED UNDER THE SUPERVISION OF:
JOSHUA S. LESINSKI
DESIGNED BY: JSL CHECKED BY: TMG
R.C.E. NO.: C92605
10/13/22
DATE

BENCHMARK:
SEE SHEET 1

SCALE: H: 1" = 40' V: 1" = 4'

CITY OF PERRIS
DEVELOPMENT PLAN NO. 19-00016
FIRST INDUSTRIAL REALTY – RIDER STREET
STORM DRAIN IMPROVEMENT PLAN – REDLANDS AVE
LATERAL A-B-10 STA 19+00.00 – 23+28.31

SHEET NO. 9 OF 10 SHEETS

FOR: FIRST INDUSTRIAL
W.O. 19-0137
CITY FILE NO. P8-1412A

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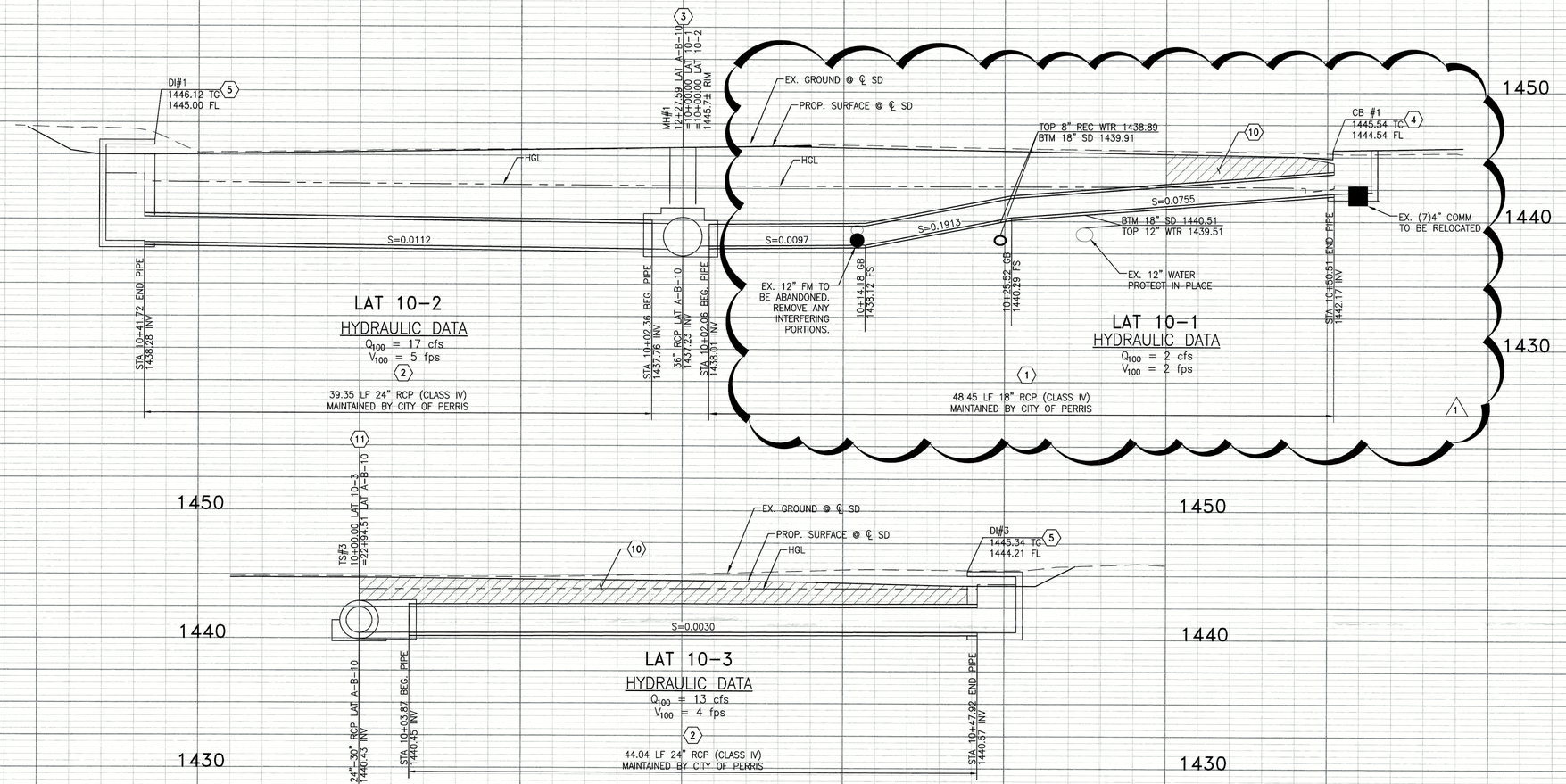

PROFILE
HORIZ: 1" = 5'
VERT: 1" = 5'

NOTE: IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY EXACT LOCATION AND ELEVATION OF ALL EXISTING FACILITIES PRIOR TO THE START OF ANY CONSTRUCTION.

CONSTRUCTION NOTES

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4. CONSTRUCT CATCH BASIN PER RCTD STD. DWG. NO. 300 (SIZE PER PLAN)
5. CONSTRUCT CONCRETE DROP INLET PER RCFC & WCD STD. DWG. NO. CB110
10. PLACE SLURRY BACKFILL PER DETAIL ON SHEET 9
11. CONSTRUCT TRANSITION STRUCTURE #3 PER RCFC & WCD STD. DWG. NO. TS303

1" = 5'
5 0 5 10 15

WDID# 8 33C395823

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MARK	BY	DATE	REVISIONS	APPR.	DATE
1	EA	11/22/22	REVISED LAT 10-1 PROFILE DESIGN AND SLURRY FILL	SEM	12-8-22
ENGINEER				CITY	

CITY OF PERRIS
APPROVED BY:
CONTRACT CITY ENGINEER
12-8-2022
DATE

SEAL – ENGINEER
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JOSHUA S. LESINSKI
NO. C92605
CIVIL
STATE OF CALIFORNIA

ALBERT A. WEBB ASSOCIATES
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PREPARED UNDER THE SUPERVISION OF:
JOSHUA S. LESINSKI
DESIGNED BY: JSL CHECKED BY: TMG
R.C.E. NO.: C92605
11/30/22
DATE

BENCHMARK:
SEE SHEET 1

SCALE:
H: 1" = 5' V: 1" = 5'

CITY OF PERRIS
DEVELOPMENT PLAN NO. 19-00016
FIRST INDUSTRIAL REALTY – RIDER STREET
STORM DRAIN IMPROVEMENT PLAN – REDLANDS AVE
SD LATERAL PROFILES

SHEET NO. 10 OF 10 SHEETS

FOR: FIRST INDUSTRIAL
W.O. 19-0137
CITY FILE NO. P8-1412A

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REDLANDS EAST HYDROLOGY MAPS

PRELIMINARY HYDROLOGY MAP
REDLANDS EAST

REDLANDS AVE.

PROP LAT A–B–10 EXTENSION

EX MDP LINE A–B

NOTES

– NODES 450, 455, AND 460 ARE SHOWN FOR REFERENCE. RATIONAL METHOD CALCULATIONS COMBINING THE FLOW RATES OF THE REDLANDS EAST AND REDLANDS WEST PROJECTS CAN BE FOUND IN THE RATIONAL METHOD HYDROLOGY.

– PEAK MITIGATED FLOW RATES HAVE BEEN CALCULATED ONLY FOR THE 100–YEAR STORM EVENT. PEAK MITIGATED FLOW RATES FOR THE 10–YEAR STORM EVENT WILL BE CONSIDERABLY LOWER THAN THE 100–YEAR PEAK MITIGATED FLOW RATES. MAP FOR THE REDLANDS WEST PROJECT.

– UNDERGROUND CHAMBERS ARE PROPOSED WITH A PROPOSED PUMP IN ORDER TO CONVEY A MAXIMUM OF 5.0 CFS TOWARDS THE PROP LAT A–B–10 ALONG REDLANDS AVENUE.

LEGEND

NODE / ELEV – NODE NU
– ELEVATION (FT)

AC / FT – AREA (AC
– LENGTH (
– DRAINAGE
– FLOWLINE (PROPOSED)
– NRCS SOIL BOUNDARY

1436.75 ADS GEOSYNTHETICS 60IT NON-WOVEN GEOTEXTILE ALL AROUND CLEAN, CRUSHED EMBEDMENT STONE

1434.75 TOP OF 45" MC-3500 CHAMBER

COMPACTED FILL

TOP OF PAVEMENT

EMBEDMENT STONE

1431.00 CHAMBER BTM

1430.25 BTM OF 9" STONE BASE STORAGE LAYER

EX. SOIL

UNDERDRAIN

UNDERGROUND STORAGE CROSS SECTION

N.T.S.

CITY OF IS, CALIFORNIA

DS EAST

DEVELOPED RATIO METHOD HYDROLOGY MAP

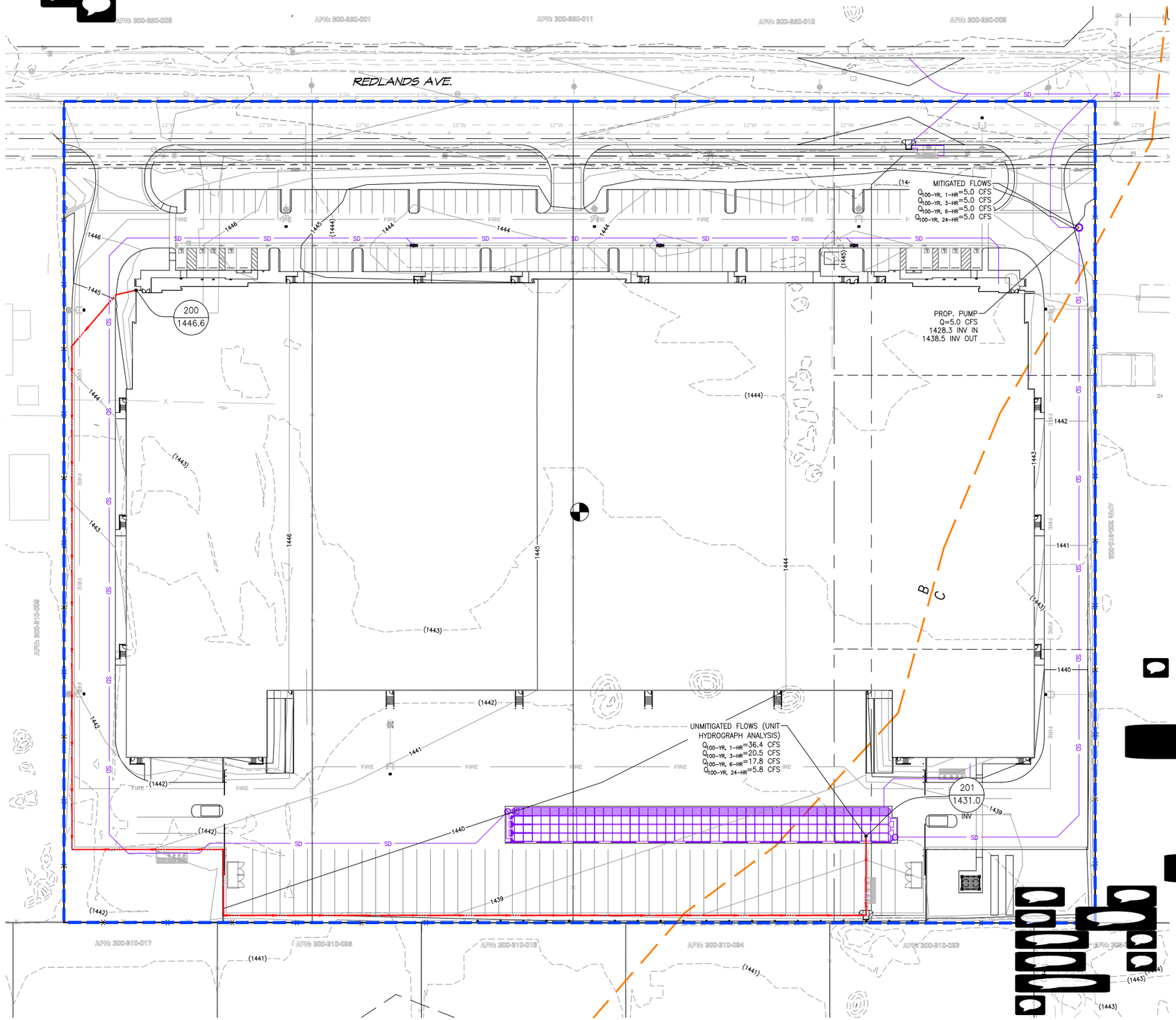
SCALE:	1"=40'	W.O.	20–0181
DATE:	11/9/2020	SHEET	1
DESIGNED:	AYS	OF	1 SHEETS
CHECKED:	JRG	DWG. NO.	
PLN CK REF:			
F.B.			

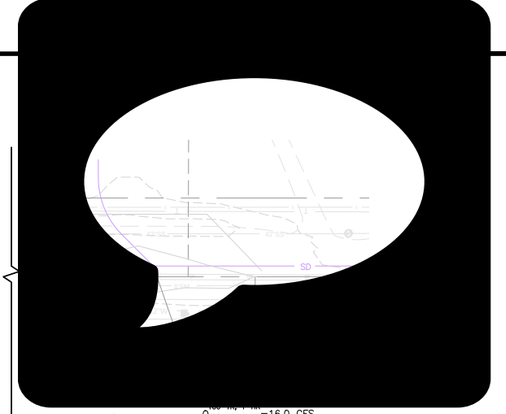
ALBERT A. WEBB ASSOCIATES
ENGINEERING CONSULTANTS
3788 McCRAY STREET
RIVERSIDE, CA. 92506
PH. (951) 686–1070
FAX (951) 788–1256

1" = 40'

H:\2020\20-0181\DRAINAGE\PHYDLDWG FOLDER\20-0181-G-RATIONAL METHOD MAPS.DWG 5/13/2021 5:32:45 PM

PRELIMINARY UNIT HYDROGRAPH MAP
REDLANDS EAST





PROPOSED	
TOTAL AREA	12.6 AC
L_T	1235 Ft
L_{CA}	300 Ft
ΔH	15.6 Ft

LEGEND

- NODE / ELEV — NODE NUMBER / ELEVATION (FT)
- AC / FT — AREA (AC) / LENGTH (FT)
- DRAINAGE AREA BOUNDARY (PROPOSED)
- FLOWLINE (PROPOSED)
- NRCS SOIL BOUNDARY

W S E N WEBB

40 0 40 80 120

CITY OF [illegible], CALIFORNIA

[illegible] EAST

DEVELOPED CONDITION
UNIT HYDROGRAPH EXHIBIT

SCALE:	1"=40'	ALBERT A. WEBB ASSOCIATES	W.O. 20-0181
DATE:	11/9/2020	ENGINEERING CONSULTANTS 3788 McCRAY STREET RIVERSIDE, CA. 92506 PH. (951) 686-1070 FAX (951) 788-1256	SHEET 1
DESIGNED:	AYS		OF 1 SHEETS
CHECKED:	JRG		DWG. NO.
PLN CK REF:			
F.B.			

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