

FINAL HYDROLOGY REPORT

For

Rockefeller – Patterson Commerce Center Development Plan Review 22-00003 Vesting Parcel Map 38384

PROJECT LOCATION

Between Patterson Avenue, Nance Street, Wade Avenue, and Washington Street
City of Perris, CA

DEVELOPER

Rockefeller Group Development
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PREPARED BY

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PREPARATION DATE

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HZ PROJECT NUMBER

R312995.01



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Introduction

This preliminary hydrology report has been prepared for Rockefeller Group Development. The project is located between Patterson Avenue, Nance Street, Wade Avenue, and Washington Street in the City of Perris, California. This project is a new development of an industrial warehouse building proposed on approximately 16.1 gross acres and 14.2 net acres of mostly undeveloped land.

Purpose

The purpose of this report is to present the drainage concept for the project and to determine the design flow rates for the project site while addressing the offsite runoff condition. The hydrology map and calculations reflect the tributary areas and the 100-year (Q_{100}) flows.

Existing Condition

The runoff from the existing onsite areas flows from west to the east in a sheet flow condition. The existing site grades range from a maximum elevation of ± 1512 mean sea level (msl) in the west region of the site to a minimum elevation of ± 1500 msl in the east region of the site, an approximately 1.4% gradient. Existing topography results in the north half of the site draining onto Patterson Avenue and flowing to the north. While the south half of the site drains onto Patterson Avenue and flows to the south. In order to accurately compare unit hydrographs of the existing site and proposed site (for mitigation purposes), the existing drainage condition will be split into two areas. See the Existing Condition Hydrology Map in Appendix A for drainage area.

Based on the Riverside County Flood Control record improvement plans, drawing 4-1121, Lateral B-5.2 continues west on Markham Street to Patterson Avenue where the line ends at a catch basin approximately 300 feet north of Markham Street. According to the Hydrology and Hydraulic Map for Optimus Logistic Center II prepared by Thienes Engineering, Inc. the north half of the project site is Tributary to Lateral B-6 and the south half of the project site is tributary to Lateral B-5.2. Additionally, the south half of the site accepts run-on from the adjacent portion of the 215 Freeway and Wade Avenue, **see Appendix H for off-site drainage maps and analysis**. Since Lateral B-5.2 of the Master Drainage Plan does not include the tributary area of the north half of the site, additional storm water will be detained onsite in order to mitigate down to existing runoff levels.

Proposed Condition

In the proposed condition, the site has been designed to generally drain in the same direction as the existing undeveloped condition. In compliance with the county and state water quality guidelines the site has been designed to incorporate a bio-retention basin to treat the storm water. The site will generally be graded to drain toward the east side of the project site. The storm water will discharge to the open bio-retention basin and disperse into the filter media within the bottom of the basin. The basin has been sized to capture and treat the WQMP storm water

volume while providing additional volume for peak storm mitigation. The onsite bio-retention basin will reduce the storm water rate of runoff during the 100-year storm event for the 1-hour, 3-hour, 6-hour, and 24-hour durations to rates below the existing undeveloped conditions.

The runoff from the southern half of the roof, truck docks and aisle, southern drive aisle, and southeast parking lot will be intercepted by area drains that connect to the proposed storm drain Line A and then directed to the basin.

The runoff from the northwestern drive aisle, northern landscaping, and parking lot and northern half of the roof will be intercepted by the proposed storm drain Line B and then directed to the basin.

The runoff from the eastern drive aisle and parking lot will be intercepted by an area drain that connects to the proposed storm drain Line C and then directed to the basin.

The basin outlet is located six inches above the top of media. Excess volume beyond the design capture volume will be detained and released at a controlled rate. The outlet size will be restricted to mitigate the peak storm and restrict post-development flow from exceeding pre-development flow. The overflow from the basin will be collected by a 12-inch riser and flow to a proposed 6 inch storm drain Line D line that drains to a proposed 24 inch public storm drain in Patterson Avenue. See Appendix A for the Proposed Condition Hydrology Map.

The proposed bio-retention basin will be used to provide water quality treatment and peak storm mitigation. Our basin routing calculations demonstrate that a maximum of 2.4 cfs will leave the site which is less than the maximum existing 3.0 cfs.

Hydrologic Analysis

The hydrologic analysis has been prepared in accordance with the Riverside County Flood Control & Water Conservation District (RCFC&WCD) Hydrology Manual Rational method using CIVILD software version 7.1. CIVILD hydrology calculations are included in Appendix B and indicate flow data at each node. Unit hydrograph and detention routing calculations are included in Appendices C and D.

The 100-year 1 hour rainfall and the 2-year 1 hour rainfall rates were taken from the isohyetal maps in the Hydrology Manual. The hydrologic soil type for the site is “B” and was taken from the soils map in the Hydrology Manual. See Appendix G for reference maps. A “commercial” land use was used for the project site with AMC III for the proposed condition.

Results

The required design capture volume is 22,238 cubic feet of storm water per the current water quality management plan guidance material. The basin has been sized to capture and treat 39,516 cubic feet of storm water. Unit hydrograph calculations were prepared to establish existing condition flow (Q's) for the south half of the site for the 100-year storm at 1-hour, 3-hour, 6-hour, and 24-hour durations, see Appendix C. Results from the detention routing calculations in Appendix D indicate the proposed peak Q's from the entire site are mitigated utilizing a 6-inch outlet pipe. The highest water surface elevation in the basin occurs during the 24-hour storm and is 1499.27 msl, which is 1.73 feet lower than the top of the basin and drains within 24 hours in all cases.

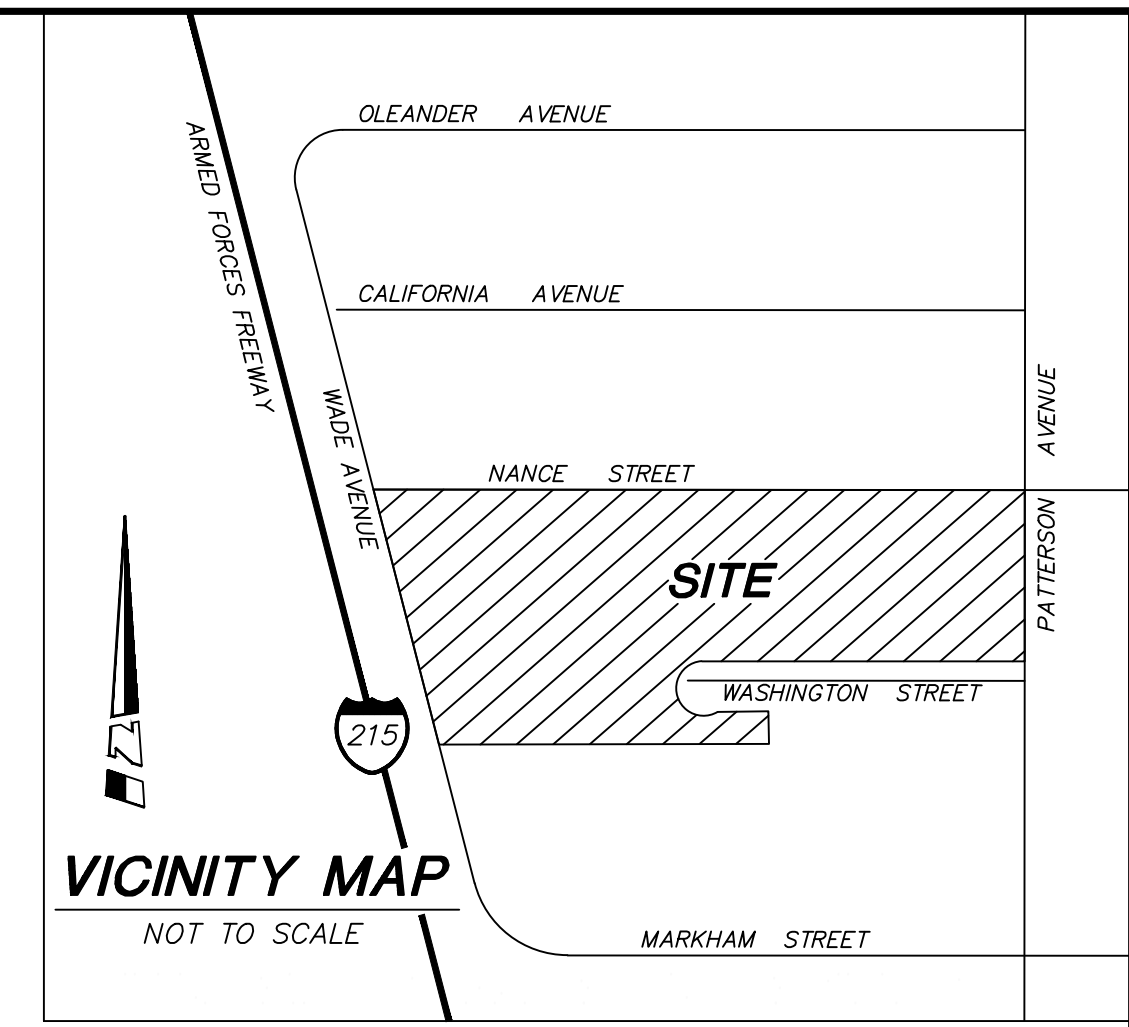
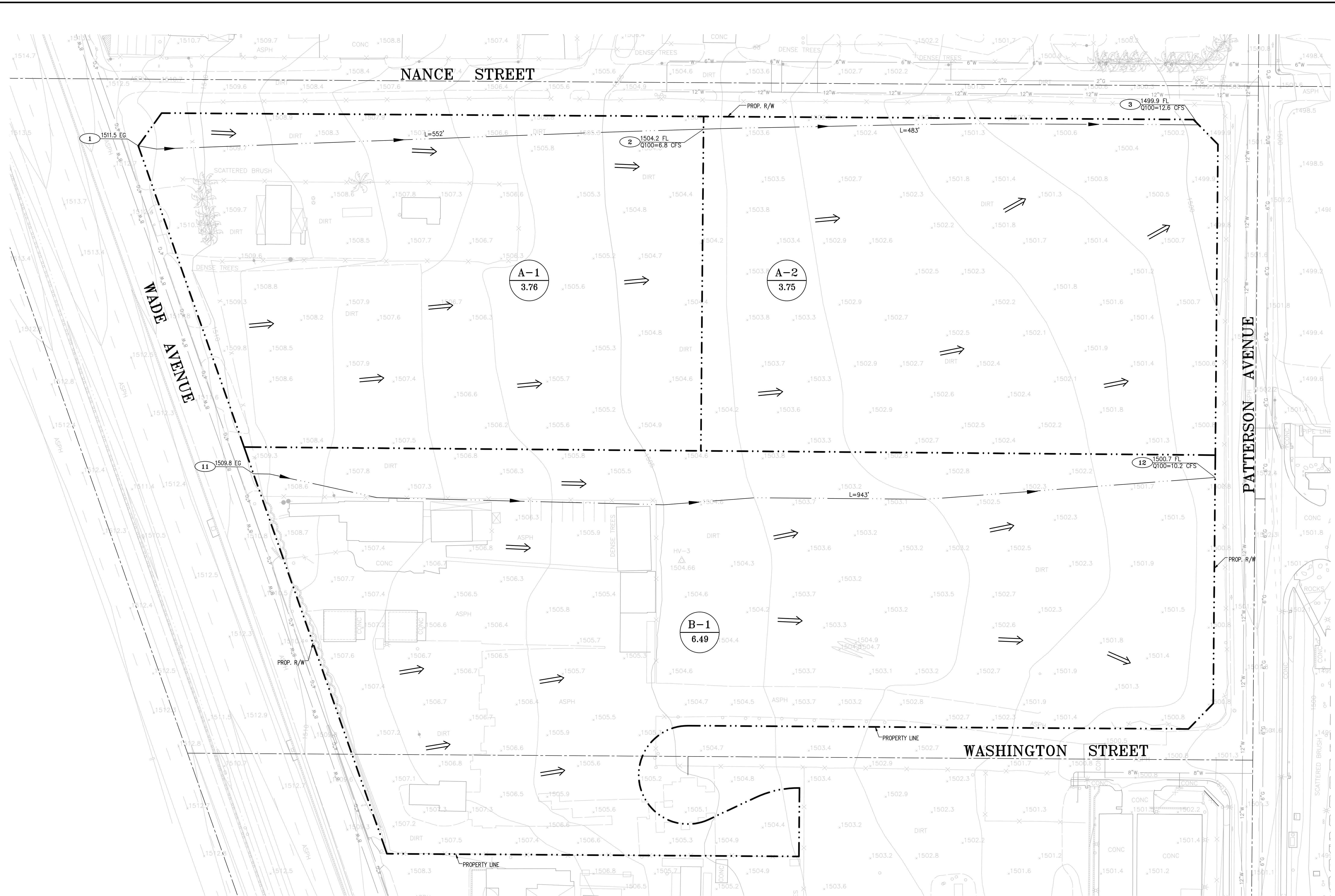
100 YEAR STORM	1 Hour	3 Hour	6 Hour	24 Hour
Existing Condition Q Out (CFS) From Unit Hydrograph Study for Existing Condition	10.3	7.7	6.6	3.0
Proposed Condition Max. Q Out (CFS) after Routing From Routing Study	2.3	2.4	2.4	2.4
WSE	1498.33	1498.92	1499.09	1499.27

All proposed project site drainage and storm drain facilities are sized adequately for 100-year storm event. On-site storm drain hydraulics and catch basin sizing are included in Appendices E and F.

Since both Lateral B-6 and Lateral B-5.2 ultimately drain to Line B (Perris Valley Channel) all portions of the site are in the same watershed. At the request of the City Lateral B-5.2 was analyzed to determine if the existing pipe has capacity to accept unmitigated runoff from the north half of the site. Appendix H includes maps, calculations, and plans of the existing storm drain showing that the pipe does in fact have capacity for the additional runoff.

As an added measure to ensure downstream flooding is avoided, we are proposing on-site mitigation to limit the runoff.

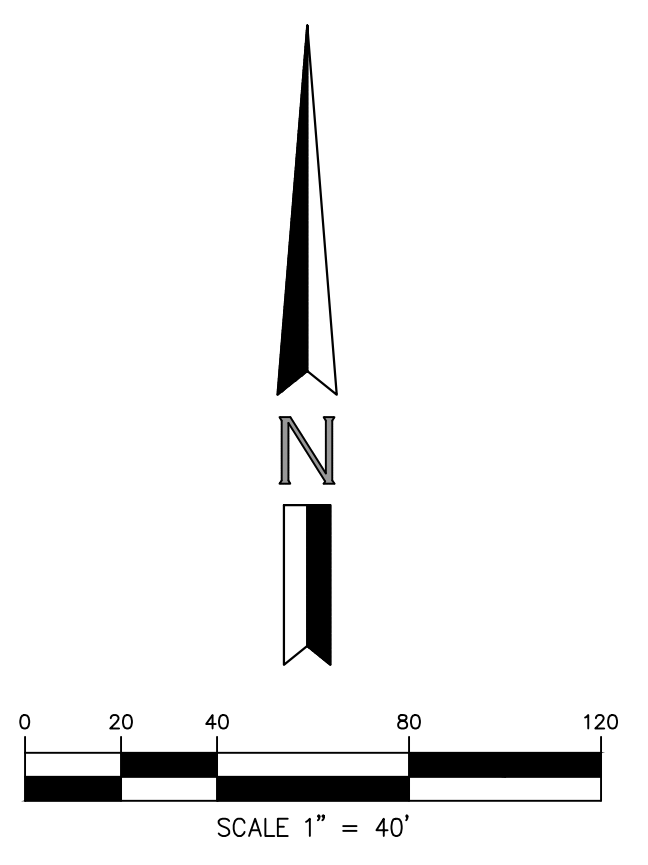
Appendix A
Existing Condition Hydrology Map
Proposed Condition Hydrology Map



- LEGEND**
- NO. HYDROLOGY MODEL NODE NUMBER
 - A-1 7.40 AC TRIBUTARY AREA IN ACRES
 - 673' LENGTH OF FLOW
 - DRAINAGE BOUNDARY
 - FLOW LINE
 - ← FLOW DIRECTION

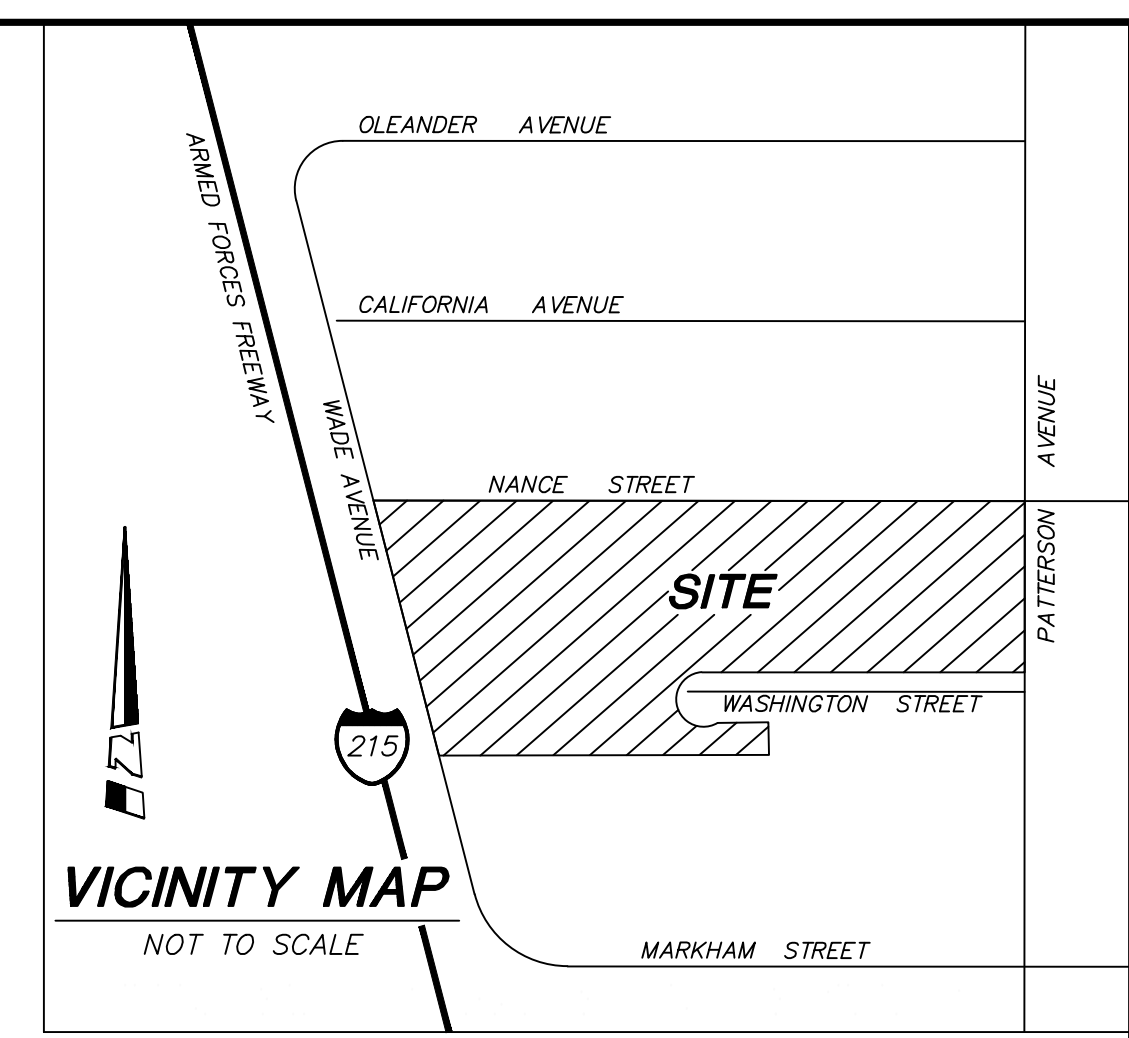
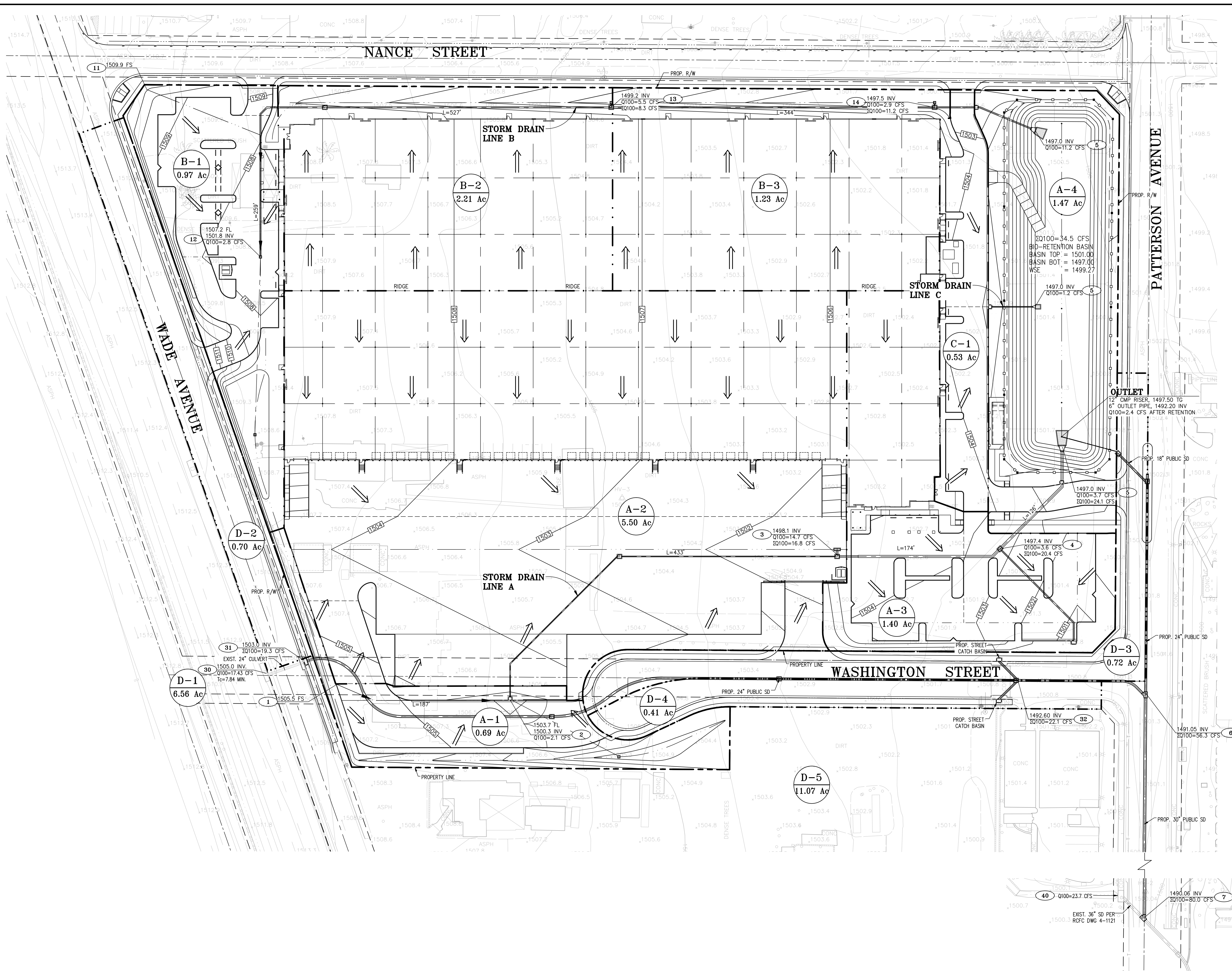
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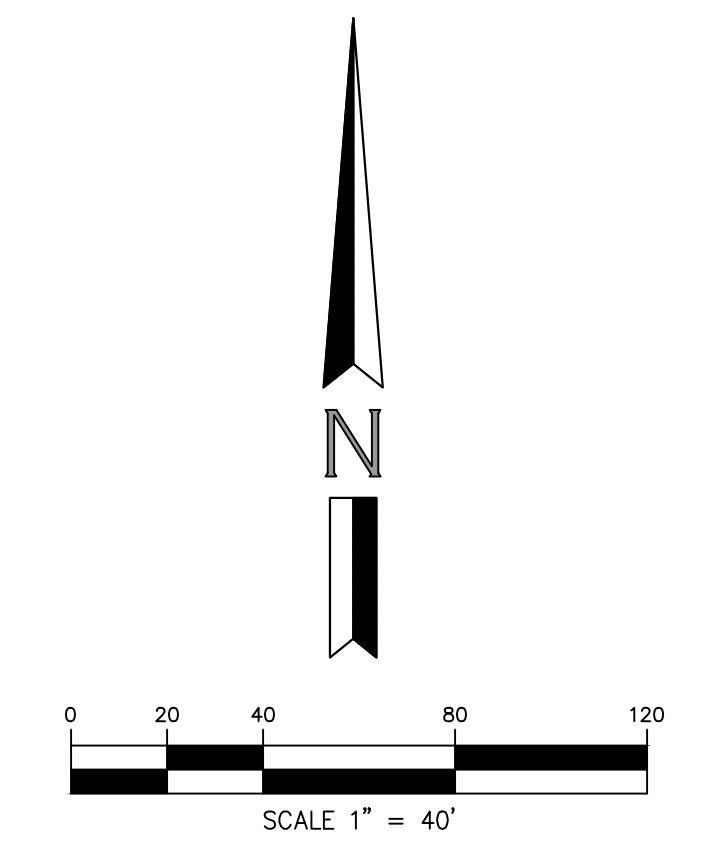
CITY OF PERRIS
 EXIST. CONDITION HYDROLOGY MAP
 ROCKEFELLER - PATTERSON COMMERCE CENTER
SHEET 1 OF 1



- LEGEND**
- NO. HYDROLOGY MODEL NODE NUMBER
 - A-11 7.40 Ac TRIBUTARY AREA IN ACRES
 - 673' LENGTH OF FLOW
 - DRAINAGE BOUNDARY
 - FLOW LINE
 - FLOW DIRECTION
 - DRAINAGE INLET/CATCH BASIN (CB)
 - PROPOSED STORM DRAIN

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CITY OF PERRIS
PROPOSED CONDITION
HYDROLOGY MAP
 ROCKEFELLER - PATTERSON COMMERCE CENTER
SHEET 1 OF 1

Appendix B
100-year Rational Method Hydrologic Analysis
-Existing Condition
-Proposed Condition

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2005 Version 7.1
Rational Hydrology Study Date: 02/04/22 File:2995q100ea.out

Rockefeller - Patterson Commercial Center
100 Year Storm Event - Existing Condition Area A
2995Q100EA
CB

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

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

Program License Serial Number 6145

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

Storm event (year) = 100.00 Antecedent Moisture Condition = 3

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 1.000 to Point/Station 2.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 552.000(Ft.)
Top (of initial area) elevation = 1511.500(Ft.)
Bottom (of initial area) elevation = 1504.200(Ft.)
Difference in elevation = 7.300(Ft.)
Slope = 0.01322 s(percent)= 1.32
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 15.732 min.
Rainfall intensity = 2.158(In/Hr) for a 100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.841
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 3) = 89.80
Pervious area fraction = 1.000; Impervious fraction = 0.000

Initial subarea runoff = 6.824(CFS)
Total initial stream area = 3.760(Ac.)
Pervious area fraction = 1.000

++++
Process from Point/Station 2.000 to Point/Station 3.000
**** IRREGULAR CHANNEL FLOW TRAVEL TIME ****

Estimated mean flow rate at midpoint of channel = 9.758(CFS)
Depth of flow = 0.260(Ft.), Average velocity = 1.440(Ft/s)
***** Irregular Channel Data *****

Information entered for subchannel number 1 :
Point number 'X' coordinate 'Y' coordinate
1 0.00 1.00
2 100.00 0.00
3 200.00 1.00
Manning's 'N' friction factor = 0.025

Sub-Channel flow = 9.759(CFS)
' ' flow top width = 52.059(Ft.)
' ' velocity = 1.440(Ft/s)
' ' area = 6.775(Sq.Ft)
' ' Froude number = 0.704

Upstream point elevation = 1504.200(Ft.)
Downstream point elevation = 1499.900(Ft.)
Flow length = 483.000(Ft.)
Travel time = 5.59 min.
Time of concentration = 21.32 min.
Depth of flow = 0.260(Ft.)
Average velocity = 1.440(Ft/s)
Total irregular channel flow = 9.758(CFS)
Irregular channel normal depth above invert elev. = 0.260(Ft.)
Average velocity of channel(s) = 1.440(Ft/s)
Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.832
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 3) = 89.80
Pervious area fraction = 1.000; Impervious fraction = 0.000
Rainfall intensity = 1.860(In/Hr) for a 100.0 year storm
Subarea runoff = 5.803(CFS) for 3.750(Ac.)
Total runoff = 12.628(CFS) Total area = 7.510(Ac.)
Depth of flow = 0.287(Ft.), Average velocity = 1.536(Ft/s)
End of computations, total study area = 7.51 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number = 78.0

Riverside County Rational Hydrology Program

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989 - 2005 Version 7.1
Rational Hydrology Study Date: 07/18/22 File:2995q100p.out

ROCKEFELLER - PATTERSON COMMERCE CENTER
100 YEAR STORM EVENT - PROPOSED CONDITION
2995Q100P
CB

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

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

Program License Serial Number 6145

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

Storm event (year) = 100.00 Antecedent Moisture Condition = 3

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 1.000 to Point/Station 2.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 187.000(Ft.)
Top (of initial area) elevation = 1505.500(Ft.)
Bottom (of initial area) elevation = 1503.500(Ft.)
Difference in elevation = 2.000(Ft.)
Slope = 0.01070 s(percent)= 1.07
TC = k(0.300)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 6.026 min.
Rainfall intensity = 3.454(In/Hr) for a 100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.890
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3) = 74.80
Pervious area fraction = 0.100; Impervious fraction = 0.900

Initial subarea runoff = 2.120(CFS)
Total initial stream area = 0.690(Ac.)
Pervious area fraction = 0.100

++++
Process from Point/Station 2.000 to Point/Station 3.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 1500.300(Ft.)
Downstream point/station elevation = 1498.100(Ft.)
Pipe length = 433.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 2.120(CFS)
Nearest computed pipe diameter = 12.00(In.)
Calculated individual pipe flow = 2.120(CFS)
Normal flow depth in pipe = 8.38(In.)
Flow top width inside pipe = 11.02(In.)
Critical Depth = 7.46(In.)
Pipe flow velocity = 3.62(Ft/s)
Travel time through pipe = 1.99 min.
Time of concentration (TC) = 8.02 min.

++++
Process from Point/Station 3.000 to Point/Station 3.000
**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Runoff Coefficient = 0.888
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 3) = 74.80
Pervious area fraction = 0.100; Impervious fraction = 0.900
Time of concentration = 8.02 min.
Rainfall intensity = 3.002(In/Hr) for a 100.0 year storm
Subarea runoff = 14.668(CFS) for 5.500(Ac.)
Total runoff = 16.788(CFS) Total area = 6.190(Ac.)

++++
Process from Point/Station 3.000 to Point/Station 4.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 1498.100(Ft.)
Downstream point/station elevation = 1497.400(Ft.)
Pipe length = 174.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 16.788(CFS)
Nearest computed pipe diameter = 27.00(In.)
Calculated individual pipe flow = 16.788(CFS)
Normal flow depth in pipe = 19.20(In.)
Flow top width inside pipe = 24.48(In.)
Critical Depth = 17.15(In.)
Pipe flow velocity = 5.55(Ft/s)
Travel time through pipe = 0.52 min.
Time of concentration (TC) = 8.54 min.

++++
Process from Point/Station 4.000 to Point/Station 4.000
**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Runoff Coefficient = 0.888
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 3) = 74.80
Pervious area fraction = 0.100; Impervious fraction = 0.900
Time of concentration = 8.54 min.
Rainfall intensity = 2.911(In/Hr) for a 100.0 year storm
Subarea runoff = 3.619(CFS) for 1.400(Ac.)
Total runoff = 20.407(CFS) Total area = 7.590(Ac.)

+++++
Process from Point/Station 4.000 to Point/Station 5.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 1497.400(Ft.)
Downstream point/station elevation = 1497.000(Ft.)
Pipe length = 126.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 20.407(CFS)
Nearest computed pipe diameter = 30.00(In.)
Calculated individual pipe flow = 20.407(CFS)
Normal flow depth in pipe = 21.89(In.)
Flow top width inside pipe = 26.65(In.)
Critical Depth = 18.40(In.)
Pipe flow velocity = 5.31(Ft/s)
Travel time through pipe = 0.40 min.
Time of concentration (TC) = 8.94 min.

+++++
Process from Point/Station 5.000 to Point/Station 5.000
**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Runoff Coefficient = 0.888
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 3) = 74.80
Pervious area fraction = 0.100; Impervious fraction = 0.900
Time of concentration = 8.94 min.
Rainfall intensity = 2.847(In/Hr) for a 100.0 year storm
Subarea runoff = 3.715(CFS) for 1.470(Ac.)
Total runoff = 24.123(CFS) Total area = 9.060(Ac.)

+++++
Process from Point/Station 5.000 to Point/Station 5.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 1
Stream flow area = 9.060(Ac.)
Runoff from this stream = 24.123(CFS)
Time of concentration = 8.94 min.
Rainfall intensity = 2.847(In/Hr)
Program is now starting with Main Stream No. 2

Process from Point/Station 11.000 to Point/Station 12.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 258.000 (Ft.)
Top (of initial area) elevation = 1509.900 (Ft.)
Bottom (of initial area) elevation = 1507.400 (Ft.)
Difference in elevation = 2.500 (Ft.)
Slope = 0.00969 s(percent) = 0.97
TC = $k(0.300)*[(length^3)/(elevation\ change)]^{0.2}$
Initial area time of concentration = 6.990 min.
Rainfall intensity = 3.211 (In/Hr) for a 100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.889
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 3) = 74.80
Pervious area fraction = 0.100; Impervious fraction = 0.900
Initial subarea runoff = 2.769 (CFS)
Total initial stream area = 0.970 (Ac.)
Pervious area fraction = 0.100

Process from Point/Station 12.000 to Point/Station 13.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 1501.800 (Ft.)
Downstream point/station elevation = 1499.200 (Ft.)
Pipe length = 527.00 (Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 2.769 (CFS)
Nearest computed pipe diameter = 15.00 (In.)
Calculated individual pipe flow = 2.769 (CFS)
Normal flow depth in pipe = 8.46 (In.)
Flow top width inside pipe = 14.88 (In.)
Critical Depth = 8.02 (In.)
Pipe flow velocity = 3.88 (Ft/s)
Travel time through pipe = 2.26 min.
Time of concentration (TC) = 9.25 min.

Process from Point/Station 13.000 to Point/Station 13.000
**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Runoff Coefficient = 0.888
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 3) = 74.80
Pervious area fraction = 0.100; Impervious fraction = 0.900
Time of concentration = 9.25 min.
Rainfall intensity = 2.799 (In/Hr) for a 100.0 year storm
Subarea runoff = 5.490 (CFS) for 2.210 (Ac.)
Total runoff = 8.259 (CFS) Total area = 3.180 (Ac.)

Process from Point/Station 13.000 to Point/Station 14.000

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

Upstream point/station elevation = 1499.200(Ft.)
Downstream point/station elevation = 1497.500(Ft.)
Pipe length = 344.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 8.259(CFS)
Nearest computed pipe diameter = 21.00(In.)
Calculated individual pipe flow = 8.259(CFS)
Normal flow depth in pipe = 13.45(In.)
Flow top width inside pipe = 20.15(In.)
Critical Depth = 12.80(In.)
Pipe flow velocity = 5.07(Ft/s)
Travel time through pipe = 1.13 min.
Time of concentration (TC) = 10.39 min.

+++++
Process from Point/Station 14.000 to Point/Station 14.000
**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Runoff Coefficient = 0.887
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 3) = 74.80
Pervious area fraction = 0.100; Impervious fraction = 0.900
Time of concentration = 10.39 min.
Rainfall intensity = 2.645(In/Hr) for a 100.0 year storm
Subarea runoff = 2.886(CFS) for 1.230(Ac.)
Total runoff = 11.145(CFS) Total area = 4.410(Ac.)

+++++
Process from Point/Station 14.000 to Point/Station 5.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 1497.500(Ft.)
Downstream point/station elevation = 1497.000(Ft.)
Pipe length = 95.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 11.145(CFS)
Nearest computed pipe diameter = 21.00(In.)
Calculated individual pipe flow = 11.145(CFS)
Normal flow depth in pipe = 16.66(In.)
Flow top width inside pipe = 17.00(In.)
Critical Depth = 14.93(In.)
Pipe flow velocity = 5.45(Ft/s)
Travel time through pipe = 0.29 min.
Time of concentration (TC) = 10.68 min.

+++++
Process from Point/Station 5.000 to Point/Station 5.000
**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Runoff Coefficient = 0.887
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 3) = 74.80

Pervious area fraction = 0.100; Impervious fraction = 0.900
 Time of concentration = 10.68 min.
 Rainfall intensity = 2.610(In/Hr) for a 100.0 year storm
 Subarea runoff = 1.227(CFS) for 0.530(Ac.)
 Total runoff = 12.372(CFS) Total area = 4.940(Ac.)

++++
 Process from Point/Station 5.000 to Point/Station 5.000
 **** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2
 Stream flow area = 4.940(Ac.)
 Runoff from this stream = 12.372(CFS)
 Time of concentration = 10.68 min.
 Rainfall intensity = 2.610(In/Hr)
 Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	24.123	8.94	2.847
2	12.372	10.68	2.610

Largest stream flow has longer or shorter time of concentration

Qp = 24.123 + sum of
 Qa Tb/Ta
 12.372 * 0.837 = 10.357
 Qp = 34.480

Total of 2 main streams to confluence:

Flow rates before confluence point:
 24.123 12.372
 Area of streams before confluence:
 9.060 4.940

Results of confluence:

Total flow rate = 34.480(CFS)
 Time of concentration = 8.938 min.
 Effective stream area after confluence = 14.000(Ac.)

++++
 Process from Point/Station 5.000 to Point/Station 6.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 1492.200(Ft.)
 Downstream point/station elevation = 1490.820(Ft.)
 Pipe length = 345.00(Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 34.480(CFS)
 Nearest computed pipe diameter = 33.00(In.)
 Calculated individual pipe flow = 34.480(CFS)
 Normal flow depth in pipe = 28.03(In.)
 Flow top width inside pipe = 23.60(In.)
 Critical Depth = 23.46(In.)
 Pipe flow velocity = 6.41(Ft/s)
 Travel time through pipe = 0.90 min.
 Time of concentration (TC) = 9.84 min.

++++

Process from Point/Station 6.000 to Point/Station 6.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 1
Stream flow area = 14.000 (Ac.)
Runoff from this stream = 34.480 (CFS)
Time of concentration = 9.84 min.
Rainfall intensity = 2.717 (In/Hr)
Program is now starting with Main Stream No. 2

Process from Point/Station 30.000 to Point/Station 31.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****

Rainfall intensity = 3.036 (In/Hr) for a 100.0 year storm
COMMERCIAL subarea type
Runoff Coefficient = 0.888
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 1.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 0.000
RI index for soil (AMC 3) = 74.80
Pervious area fraction = 0.100; Impervious fraction = 0.900
User specified values are as follows:
TC = 7.84 min. Rain intensity = 3.04 (In/Hr)
Total area = 6.56 (Ac.) Total runoff = 17.43 (CFS)

Process from Point/Station 31.000 to Point/Station 31.000
**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Runoff Coefficient = 0.888
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 3) = 74.80
Pervious area fraction = 0.100; Impervious fraction = 0.900
Time of concentration = 7.84 min.
Rainfall intensity = 3.036 (In/Hr) for a 100.0 year storm
Subarea runoff = 1.888 (CFS) for 0.700 (Ac.)
Total runoff = 19.318 (CFS) Total area = 7.260 (Ac.)

Process from Point/Station 31.000 to Point/Station 32.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 1503.000 (Ft.)
Downstream point/station elevation = 1492.600 (Ft.)
Pipe length = 775.00 (Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 19.318 (CFS)
Nearest computed pipe diameter = 24.00 (In.)
Calculated individual pipe flow = 19.318 (CFS)
Normal flow depth in pipe = 15.33 (In.)
Flow top width inside pipe = 23.06 (In.)
Critical Depth = 18.96 (In.)
Pipe flow velocity = 9.12 (Ft/s)
Travel time through pipe = 1.42 min.

Time of concentration (TC) = 9.26 min.

+++++
Process from Point/Station 32.000 to Point/Station 32.000
**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Runoff Coefficient = 0.888
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 3) = 74.80
Pervious area fraction = 0.100; Impervious fraction = 0.900
Time of concentration = 9.26 min.
Rainfall intensity = 2.799(In/Hr) for a 100.0 year storm
Subarea runoff = 1.789(CFS) for 0.720(Ac.)
Total runoff = 21.107(CFS) Total area = 7.980(Ac.)

+++++
Process from Point/Station 32.000 to Point/Station 32.000
**** SUBAREA FLOW ADDITION ****

COMMERCIAL subarea type
Runoff Coefficient = 0.888
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 3) = 74.80
Pervious area fraction = 0.100; Impervious fraction = 0.900
Time of concentration = 9.26 min.
Rainfall intensity = 2.799(In/Hr) for a 100.0 year storm
Subarea runoff = 1.018(CFS) for 0.410(Ac.)
Total runoff = 22.125(CFS) Total area = 8.390(Ac.)

+++++
Process from Point/Station 32.000 to Point/Station 6.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 1492.600(Ft.)
Downstream point/station elevation = 1490.820(Ft.)
Pipe length = 160.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 22.125(CFS)
Nearest computed pipe diameter = 24.00(In.)
Calculated individual pipe flow = 22.125(CFS)
Normal flow depth in pipe = 18.26(In.)
Flow top width inside pipe = 20.48(In.)
Critical Depth = 20.16(In.)
Pipe flow velocity = 8.62(Ft/s)
Travel time through pipe = 0.31 min.
Time of concentration (TC) = 9.56 min.

+++++
Process from Point/Station 6.000 to Point/Station 6.000
**** CONFLUENCE OF MAIN STREAMS ****

The following data inside Main Stream is listed:

In Main Stream number: 2

Stream flow area = 8.390 (Ac.)
 Runoff from this stream = 22.125 (CFS)
 Time of concentration = 9.56 min.
 Rainfall intensity = 2.754 (In/Hr)
 Summary of stream data:

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

1	34.480	9.84	2.717
2	22.125	9.56	2.754

Largest stream flow has longer time of concentration

Qp = 34.480 + sum of
 Qb Ia/Ib
 22.125 * 0.986 = 21.825
 Qp = 56.305

Total of 2 main streams to confluence:

Flow rates before confluence point:

34.480 22.125

Area of streams before confluence:

14.000 8.390

Results of confluence:

Total flow rate = 56.305 (CFS)

Time of concentration = 9.835 min.

Effective stream area after confluence = 22.390 (Ac.)

 Process from Point/Station 6.000 to Point/Station 7.000
 **** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 1490.820 (Ft.)
 Downstream point/station elevation = 1489.780 (Ft.)
 Pipe length = 332.00 (Ft.) Manning's N = 0.013
 No. of pipes = 1 Required pipe flow = 56.305 (CFS)
 Nearest computed pipe diameter = 42.00 (In.)
 Calculated individual pipe flow = 56.305 (CFS)
 Normal flow depth in pipe = 34.41 (In.)
 Flow top width inside pipe = 32.33 (In.)
 Critical Depth = 28.19 (In.)
 Pipe flow velocity = 6.67 (Ft/s)
 Travel time through pipe = 0.83 min.
 Time of concentration (TC) = 10.66 min.

 Process from Point/Station 40.000 to Point/Station 7.000
 **** SUBAREA FLOW ADDITION ****

SINGLE FAMILY (1/2 Acre Lot)
 Runoff Coefficient = 0.821
 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 3) = 74.80
 Pervious area fraction = 0.600; Impervious fraction = 0.400
 Time of concentration = 10.66 min.
 Rainfall intensity = 2.611 (In/Hr) for a 100.0 year storm

Subarea runoff = 23.723(CFS) for 11.070(Ac.)
Total runoff = 80.027(CFS) Total area = 33.460(Ac.)
End of computations, total study area = 33.46 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(A_p) = 0.265
Area averaged RI index number = 56.0

Appendix C

Unit Hydrograph Calculations

- Existing Condition: 1, 3, 6, 24 HR
- Proposed Condition: 1, 3, 6, 24 HR

Unit Hydrograph Analysis

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Study date 02/04/22 File: 2995q100UHE1100.out

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

Program License Serial Number 6145

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

English Units used in output format

Rockefeller - Patterson Commerce Center
Unit Hydrograph for 1 Hour 100 Year Storm Event - Existing Condition
2995q100uhe
cb

Drainage Area = 6.49(Ac.) = 0.010 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 6.49(Ac.) = 0.010 Sq. Mi.
USER Entry of lag time in hours
Lag time = 0.277 Hr.
Lag time = 16.61 Min.
25% of lag time = 4.15 Min.
40% of lag time = 6.64 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]
6.49	0.47	3.05

100 YEAR Area rainfall data:

Area(Ac.) [1]	Rainfall(In) [2]	Weighting[1*2]
6.49	1.24	8.05

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.470 (In)
Area Averaged 100-Year Rainfall = 1.240 (In)

Point rain (area averaged) = 1.240 (In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 1.240 (In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
6.490	78.00	0.000
Total Area Entered = 6.49 (Ac.)		

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
78.0	89.8	0.132	0.000	0.132	1.000	0.132
						Sum (F) = 0.132

Area averaged mean soil loss (F) (In/Hr) = 0.132

Minimum soil loss rate ((In/Hr)) = 0.066

(for 24 hour storm duration)

Soil low loss rate (decimal) = 0.900

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 (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	30.110	2.914
2	0.167	60.221	10.702
3	0.250	90.331	18.680
4	0.333	120.441	20.183
5	0.417	150.552	12.756
6	0.500	180.662	7.329
7	0.583	210.772	4.748
8	0.667	240.883	3.703
9	0.750	270.993	2.990
10	0.833	301.103	2.485
11	0.917	331.214	1.979
12	1.000	361.324	1.773
13	1.083	391.434	1.419
14	1.167	421.545	1.232
15	1.250	451.655	0.978
16	1.333	481.765	0.930
17	1.417	511.876	0.885
18	1.500	541.986	0.707
19	1.583	572.096	0.630
20	1.667	602.206	0.546
21	1.750	632.317	0.473
22	1.833	662.427	0.411
23	1.917	692.537	0.322
24	2.000	722.648	0.301
25	2.083	752.758	0.301
26	2.167	782.868	0.301
27	2.250	812.979	0.322
Sum = 100.000			Sum= 6.541

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr)		Effective (In/Hr)
				Max	Low	
1	0.08	4.20	0.625	0.132	---	0.49
2	0.17	4.30	0.640	0.132	---	0.51
3	0.25	5.00	0.744	0.132	---	0.61
4	0.33	5.00	0.744	0.132	---	0.61
5	0.42	5.80	0.863	0.132	---	0.73
6	0.50	6.50	0.967	0.132	---	0.83
7	0.58	7.40	1.101	0.132	---	0.97
8	0.67	8.60	1.280	0.132	---	1.15
9	0.75	12.30	1.830	0.132	---	1.70

10	0.83	29.10	4.330	0.132	---	4.20
11	0.92	6.80	1.012	0.132	---	0.88
12	1.00	5.00	0.744	0.132	---	0.61
Sum =		100.0				Sum = 13.3

Flood volume = Effective rainfall 1.11 (In)
times area 6.5 (Ac.) / [(In) / (Ft.)] = 0.6 (Ac.Ft)
Total soil loss = 0.13 (In)
Total soil loss = 0.072 (Ac.Ft)
Total rainfall = 1.24 (In)
Flood volume = 26094.7 Cubic Feet
Total soil loss = 3116.3 Cubic Feet

Peak flow rate of this hydrograph = 10.307 (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	5.0	10.0	15.0	20.0
0+ 5	0.0006	0.09	Q				
0+10	0.0037	0.44	Q				
0+15	0.0111	1.07	V Q				
0+20	0.0236	1.82	V Q				
0+25	0.0401	2.40	V Q				
0+30	0.0600	2.89	VQ				
0+35	0.0832	3.38	VQ				
0+40	0.1105	3.96	Q				
0+45	0.1431	4.73	Q				
0+50	0.1861	6.24	Q	Q			
0+55	0.2449	8.55		VQ			
1+ 0	0.3159	10.31			QV		
1+ 5	0.3844	9.94			Q	V	
1+10	0.4349	7.34		Q		V	
1+15	0.4693	4.98		Q		V	
1+20	0.4926	3.39		Q		V	
1+25	0.5101	2.54		Q		V	
1+30	0.5241	2.03		Q		V	
1+35	0.5356	1.68		Q		V	
1+40	0.5452	1.39	Q			V	
1+45	0.5534	1.19	Q			V	
1+50	0.5603	1.00	Q			V	
1+55	0.5662	0.86	Q			V	
2+ 0	0.5712	0.73	Q			V	
2+ 5	0.5757	0.65	Q			V	
2+10	0.5797	0.59	Q			V	
2+15	0.5832	0.51	Q			V	
2+20	0.5862	0.44	Q			V	
2+25	0.5888	0.37	Q			V	
2+30	0.5910	0.32	Q			V	
2+35	0.5929	0.27	Q			V	
2+40	0.5944	0.22	Q			V	
2+45	0.5957	0.19	Q			V	
2+50	0.5969	0.17	Q			V	
2+55	0.5979	0.15	Q			V	
3+ 0	0.5988	0.12	Q			V	
3+ 5	0.5990	0.03	Q			V	
3+10	0.5991	0.01	Q			V	

Unit Hydrograph Analysis

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Study date 02/04/22 File: 2995Q100UHE3100.out

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

Program License Serial Number 6145

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

English Units used in output format

Rockefeller - Patterson Commerce Center
Unit Hydrograph for 3 Hour 100 Year Storm Event - Existing Condition
2995q100uhe
cb

Drainage Area = 6.49(Ac.) = 0.010 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 6.49(Ac.) = 0.010 Sq. Mi.
USER Entry of lag time in hours
Lag time = 0.277 Hr.
Lag time = 16.61 Min.
25% of lag time = 4.15 Min.
40% of lag time = 6.64 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]
6.49	0.79	5.13

100 YEAR Area rainfall data:

Area(Ac.) [1]	Rainfall(In) [2]	Weighting[1*2]
6.49	1.90	12.33

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.790 (In)
Area Averaged 100-Year Rainfall = 1.900 (In)

Point rain (area averaged) = 1.900 (In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 1.900 (In)

Sub-Area Data:
Area(Ac.) Runoff Index Impervious %

6.490 78.00 0.000
 Total Area Entered = 6.49(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
78.0	89.8	0.132	0.000	0.132	1.000	0.132
						Sum (F) = 0.132

Area averaged mean soil loss (F) (In/Hr) = 0.132
 Minimum soil loss rate ((In/Hr)) = 0.066
 (for 24 hour storm duration)
 Soil low loss rate (decimal) = 0.900

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

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	30.110	2.914
2	0.167	60.221	10.702
3	0.250	90.331	18.680
4	0.333	120.441	20.183
5	0.417	150.552	12.756
6	0.500	180.662	7.329
7	0.583	210.772	4.748
8	0.667	240.883	3.703
9	0.750	270.993	2.990
10	0.833	301.103	2.485
11	0.917	331.214	1.979
12	1.000	361.324	1.773
13	1.083	391.434	1.419
14	1.167	421.545	1.232
15	1.250	451.655	0.978
16	1.333	481.765	0.930
17	1.417	511.876	0.885
18	1.500	541.986	0.707
19	1.583	572.096	0.630
20	1.667	602.206	0.546
21	1.750	632.317	0.473
22	1.833	662.427	0.411
23	1.917	692.537	0.322
24	2.000	722.648	0.301
25	2.083	752.758	0.301
26	2.167	782.868	0.301
27	2.250	812.979	0.322
Sum = 100.000			Sum= 6.541

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max Low	Effective (In/Hr)
1	0.08	1.30	0.296 0.132	0.16
2	0.17	1.30	0.296 0.132	0.16
3	0.25	1.10	0.251 0.132	0.12
4	0.33	1.50	0.342 0.132	0.21
5	0.42	1.50	0.342 0.132	0.21
6	0.50	1.80	0.410 0.132	0.28
7	0.58	1.50	0.342 0.132	0.21
8	0.67	1.80	0.410 0.132	0.28

9	0.75	1.80	0.410	0.132	---	0.28
10	0.83	1.50	0.342	0.132	---	0.21
11	0.92	1.60	0.365	0.132	---	0.23
12	1.00	1.80	0.410	0.132	---	0.28
13	1.08	2.20	0.502	0.132	---	0.37
14	1.17	2.20	0.502	0.132	---	0.37
15	1.25	2.20	0.502	0.132	---	0.37
16	1.33	2.00	0.456	0.132	---	0.32
17	1.42	2.60	0.593	0.132	---	0.46
18	1.50	2.70	0.616	0.132	---	0.48
19	1.58	2.40	0.547	0.132	---	0.41
20	1.67	2.70	0.616	0.132	---	0.48
21	1.75	3.30	0.752	0.132	---	0.62
22	1.83	3.10	0.707	0.132	---	0.57
23	1.92	2.90	0.661	0.132	---	0.53
24	2.00	3.00	0.684	0.132	---	0.55
25	2.08	3.10	0.707	0.132	---	0.57
26	2.17	4.20	0.958	0.132	---	0.83
27	2.25	5.00	1.140	0.132	---	1.01
28	2.33	3.50	0.798	0.132	---	0.67
29	2.42	6.80	1.550	0.132	---	1.42
30	2.50	7.30	1.664	0.132	---	1.53
31	2.58	8.20	1.870	0.132	---	1.74
32	2.67	5.90	1.345	0.132	---	1.21
33	2.75	2.00	0.456	0.132	---	0.32
34	2.83	1.80	0.410	0.132	---	0.28
35	2.92	1.80	0.410	0.132	---	0.28
36	3.00	0.60	0.137	0.132	---	0.00
Sum =	100.0					Sum = 18.0

Flood volume = Effective rainfall 1.50 (In)
times area 6.5(Ac.)/[(In)/(Ft.)] = 0.8(Ac.Ft)
Total soil loss = 0.40 (In)
Total soil loss = 0.215(Ac.Ft)
Total rainfall = 1.90 (In)
Flood volume = 35411.2 Cubic Feet
Total soil loss = 9349.0 Cubic Feet

Peak flow rate of this hydrograph = 7.678(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	2.5	5.0	7.5	10.0
0+ 5	0.0002	0.03	Q				
0+10	0.0012	0.15	Q				
0+15	0.0036	0.34	VQ				
0+20	0.0073	0.54	V Q				
0+25	0.0120	0.69	V Q				
0+30	0.0177	0.83	V Q				
0+35	0.0246	1.00	V Q				
0+40	0.0324	1.14	V Q				
0+45	0.0411	1.26	V Q				
0+50	0.0503	1.34	V Q				
0+55	0.0599	1.39	V Q				
1+ 0	0.0696	1.41	V Q				
1+ 5	0.0796	1.45	V Q				
1+10	0.0904	1.58	V Q				
1+15	0.1026	1.77	V Q				

1+20	0.1159	1.93	V Q				
1+25	0.1300	2.04	V Q				
1+30	0.1448	2.15	VQ				
1+35	0.1608	2.31	V Q				
1+40	0.1779	2.49	VQ				
1+45	0.1960	2.63	VQ				
1+50	0.2154	2.81	VQ				
1+55	0.2363	3.04	VQ				
2+ 0	0.2585	3.21	Q				
2+ 5	0.2811	3.28	Q				
2+10	0.3044	3.38	QV				
2+15	0.3296	3.67	Q V				
2+20	0.3579	4.11	QV				
2+25	0.3897	4.62	QV				
2+30	0.4258	5.24	Q				
2+35	0.4680	6.13		VQ			
2+40	0.5176	7.21		V			
2+45	0.5705	7.68			Q		
2+50	0.6197	7.14			Q	V	
2+55	0.6596	5.79			Q		V
3+ 0	0.6899	4.40					V
3+ 5	0.7133	3.40		Q			V
3+10	0.7315	2.64		Q			V
3+15	0.7453	2.01		Q			V
3+20	0.7562	1.58		Q			V
3+25	0.7651	1.29		Q			V
3+30	0.7726	1.09		Q			V
3+35	0.7790	0.92		Q			V
3+40	0.7844	0.78		Q			V
3+45	0.7890	0.67		Q			V
3+50	0.7930	0.58		Q			V
3+55	0.7965	0.51		Q			V
4+ 0	0.7995	0.43	Q				V
4+ 5	0.8020	0.37	Q				V
4+10	0.8042	0.32	Q				V
4+15	0.8061	0.27	Q				V
4+20	0.8077	0.23	Q				V
4+25	0.8090	0.19	Q				V
4+30	0.8101	0.16	Q				V
4+35	0.8111	0.14	Q				V
4+40	0.8119	0.11	Q				V
4+45	0.8124	0.08	Q				V
4+50	0.8127	0.04	Q				V
4+55	0.8128	0.02	Q				V
5+ 0	0.8129	0.01	Q				V
5+ 5	0.8129	0.01	Q				V
5+10	0.8129	0.00	Q				V

Unit Hydrograph Analysis

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Study date 02/04/22 File: 2995Q100UHE6100.out

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

Program License Serial Number 6145

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

English Units used in output format

Rockefeller - Patterson Commerce Center
Unit Hydrograph for 6 Hour 100 Year Storm Event - Existing Condition
2995q100uhe
cb

Drainage Area = 6.49(Ac.) = 0.010 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 6.49(Ac.) = 0.010 Sq. Mi.
USER Entry of lag time in hours
Lag time = 0.277 Hr.
Lag time = 16.61 Min.
25% of lag time = 4.15 Min.
40% of lag time = 6.64 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]
6.49	1.05	6.81

100 YEAR Area rainfall data:

Area(Ac.) [1]	Rainfall(In) [2]	Weighting[1*2]
6.49	2.50	16.23

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.050 (In)
Area Averaged 100-Year Rainfall = 2.500 (In)

Point rain (area averaged) = 2.500 (In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 2.500 (In)

Sub-Area Data:
Area(Ac.) Runoff Index Impervious %

6.490 78.00 0.000
 Total Area Entered = 6.49(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
78.0	89.8	0.132	0.000	0.132	1.000	0.132
						Sum (F) = 0.132

Area averaged mean soil loss (F) (In/Hr) = 0.132
 Minimum soil loss rate ((In/Hr)) = 0.066
 (for 24 hour storm duration)
 Soil low loss rate (decimal) = 0.900

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

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)

1	0.083	30.110	2.914
2	0.167	60.221	10.702
3	0.250	90.331	18.680
4	0.333	120.441	20.183
5	0.417	150.552	12.756
6	0.500	180.662	7.329
7	0.583	210.772	4.748
8	0.667	240.883	3.703
9	0.750	270.993	2.990
10	0.833	301.103	2.485
11	0.917	331.214	1.979
12	1.000	361.324	1.773
13	1.083	391.434	1.419
14	1.167	421.545	1.232
15	1.250	451.655	0.978
16	1.333	481.765	0.930
17	1.417	511.876	0.885
18	1.500	541.986	0.707
19	1.583	572.096	0.630
20	1.667	602.206	0.546
21	1.750	632.317	0.473
22	1.833	662.427	0.411
23	1.917	692.537	0.322
24	2.000	722.648	0.301
25	2.083	752.758	0.301
26	2.167	782.868	0.301
27	2.250	812.979	0.322
Sum = 100.000			Sum= 6.541

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr)		Effective (In/Hr)
				Max	Low	
1	0.08	0.50	0.150	0.132	---	0.02
2	0.17	0.60	0.180	0.132	---	0.05
3	0.25	0.60	0.180	0.132	---	0.05
4	0.33	0.60	0.180	0.132	---	0.05
5	0.42	0.60	0.180	0.132	---	0.05
6	0.50	0.70	0.210	0.132	---	0.08
7	0.58	0.70	0.210	0.132	---	0.08
8	0.67	0.70	0.210	0.132	---	0.08

9	0.75	0.70	0.210	0.132	---	0.08
10	0.83	0.70	0.210	0.132	---	0.08
11	0.92	0.70	0.210	0.132	---	0.08
12	1.00	0.80	0.240	0.132	---	0.11
13	1.08	0.80	0.240	0.132	---	0.11
14	1.17	0.80	0.240	0.132	---	0.11
15	1.25	0.80	0.240	0.132	---	0.11
16	1.33	0.80	0.240	0.132	---	0.11
17	1.42	0.80	0.240	0.132	---	0.11
18	1.50	0.80	0.240	0.132	---	0.11
19	1.58	0.80	0.240	0.132	---	0.11
20	1.67	0.80	0.240	0.132	---	0.11
21	1.75	0.80	0.240	0.132	---	0.11
22	1.83	0.80	0.240	0.132	---	0.11
23	1.92	0.80	0.240	0.132	---	0.11
24	2.00	0.90	0.270	0.132	---	0.14
25	2.08	0.80	0.240	0.132	---	0.11
26	2.17	0.90	0.270	0.132	---	0.14
27	2.25	0.90	0.270	0.132	---	0.14
28	2.33	0.90	0.270	0.132	---	0.14
29	2.42	0.90	0.270	0.132	---	0.14
30	2.50	0.90	0.270	0.132	---	0.14
31	2.58	0.90	0.270	0.132	---	0.14
32	2.67	0.90	0.270	0.132	---	0.14
33	2.75	1.00	0.300	0.132	---	0.17
34	2.83	1.00	0.300	0.132	---	0.17
35	2.92	1.00	0.300	0.132	---	0.17
36	3.00	1.00	0.300	0.132	---	0.17
37	3.08	1.00	0.300	0.132	---	0.17
38	3.17	1.10	0.330	0.132	---	0.20
39	3.25	1.10	0.330	0.132	---	0.20
40	3.33	1.10	0.330	0.132	---	0.20
41	3.42	1.20	0.360	0.132	---	0.23
42	3.50	1.30	0.390	0.132	---	0.26
43	3.58	1.40	0.420	0.132	---	0.29
44	3.67	1.40	0.420	0.132	---	0.29
45	3.75	1.50	0.450	0.132	---	0.32
46	3.83	1.50	0.450	0.132	---	0.32
47	3.92	1.60	0.480	0.132	---	0.35
48	4.00	1.60	0.480	0.132	---	0.35
49	4.08	1.70	0.510	0.132	---	0.38
50	4.17	1.80	0.540	0.132	---	0.41
51	4.25	1.90	0.570	0.132	---	0.44
52	4.33	2.00	0.600	0.132	---	0.47
53	4.42	2.10	0.630	0.132	---	0.50
54	4.50	2.10	0.630	0.132	---	0.50
55	4.58	2.20	0.660	0.132	---	0.53
56	4.67	2.30	0.690	0.132	---	0.56
57	4.75	2.40	0.720	0.132	---	0.59
58	4.83	2.40	0.720	0.132	---	0.59
59	4.92	2.50	0.750	0.132	---	0.62
60	5.00	2.60	0.780	0.132	---	0.65
61	5.08	3.10	0.930	0.132	---	0.80
62	5.17	3.60	1.080	0.132	---	0.95
63	5.25	3.90	1.170	0.132	---	1.04
64	5.33	4.20	1.260	0.132	---	1.13
65	5.42	4.70	1.410	0.132	---	1.28
66	5.50	5.60	1.680	0.132	---	1.55
67	5.58	1.90	0.570	0.132	---	0.44
68	5.67	0.90	0.270	0.132	---	0.14
69	5.75	0.60	0.180	0.132	---	0.05
70	5.83	0.50	0.150	0.132	---	0.02
71	5.92	0.30	0.090	0.132	0.081	0.01

72 6.00 0.20 0.060 0.132 0.054 0.01
 Sum = 100.0 Sum = 20.6
 Flood volume = Effective rainfall 1.72 (In)
 times area 6.5(Ac.)/[(In)/(Ft.)] = 0.9(Ac.Ft)
 Total soil loss = 0.78(In)
 Total soil loss = 0.423(Ac.Ft)
 Total rainfall = 2.50(In)
 Flood volume = 40451.7 Cubic Feet
 Total soil loss = 18443.7 Cubic Feet

 Peak flow rate of this hydrograph = 6.570(CFS)

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 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	2.5	5.0	7.5	10.0
0+ 5	0.0000	0.00	Q				
0+10	0.0002	0.02	Q				
0+15	0.0006	0.06	Q				
0+20	0.0015	0.12	Q				
0+25	0.0027	0.18	Q				
0+30	0.0042	0.22	Q				
0+35	0.0060	0.26	VQ				
0+40	0.0081	0.31	VQ				
0+45	0.0106	0.36	VQ				
0+50	0.0133	0.39	VQ				
0+55	0.0162	0.41	VQ				
1+ 0	0.0192	0.44	VQ				
1+ 5	0.0224	0.47	VQ				
1+10	0.0259	0.52	VQ				
1+15	0.0298	0.56	VQ				
1+20	0.0339	0.60	VQ				
1+25	0.0382	0.62	VQ				
1+30	0.0425	0.63	VQ				
1+35	0.0470	0.64	Q				
1+40	0.0514	0.65	Q				
1+45	0.0560	0.66	Q				
1+50	0.0606	0.67	Q				
1+55	0.0652	0.67	Q				
2+ 0	0.0700	0.68	QV				
2+ 5	0.0748	0.70	QV				
2+10	0.0798	0.73	QV				
2+15	0.0851	0.76	Q				
2+20	0.0904	0.78	Q				
2+25	0.0960	0.81	QV				
2+30	0.1018	0.84	QV				
2+35	0.1077	0.85	QV				
2+40	0.1136	0.86	QV				
2+45	0.1196	0.87	Q V				
2+50	0.1258	0.90	Q V				
2+55	0.1322	0.94	Q V				
3+ 0	0.1390	0.98	Q V				
3+ 5	0.1460	1.01	Q V				
3+10	0.1531	1.03	Q V				
3+15	0.1604	1.07	Q V				
3+20	0.1681	1.11	Q V				
3+25	0.1761	1.17	Q V				
3+30	0.1846	1.22	Q V				

3+35	0.1936	1.31	Q	V				
3+40	0.2033	1.42	Q	V				
3+45	0.2139	1.54	Q	V				
3+50	0.2253	1.65	Q	V				
3+55	0.2373	1.74	Q	V				
4+ 0	0.2500	1.84	Q	V				
4+ 5	0.2633	1.94	Q	V				
4+10	0.2774	2.04	Q	V				
4+15	0.2922	2.16	Q	V				
4+20	0.3081	2.30	Q	V				
4+25	0.3250	2.45	Q	V				
4+30	0.3430	2.61	Q	V				
4+35	0.3620	2.76	Q	V				
4+40	0.3820	2.90	Q	V				
4+45	0.4029	3.04	Q	V				
4+50	0.4249	3.19	Q	V				
4+55	0.4479	3.34	Q	V				
5+ 0	0.4719	3.48	Q	V				
5+ 5	0.4970	3.65	Q	V				
5+10	0.5240	3.91	Q	V				
5+15	0.5537	4.32	Q	V				
5+20	0.5872	4.86	Q	V				
5+25	0.6247	5.44	Q	V				
5+30	0.6664	6.06	Q	V				
5+35	0.7117	6.57	Q	V				
5+40	0.7564	6.49	Q	V				
5+45	0.7946	5.55	Q	V				
5+50	0.8227	4.07	Q	V				
5+55	0.8426	2.89	Q	V				
6+ 0	0.8574	2.15	Q	V				
6+ 5	0.8692	1.70	Q	V				
6+10	0.8787	1.39	Q	V				
6+15	0.8866	1.15	Q	V				
6+20	0.8932	0.96	Q	V				
6+25	0.8989	0.82	Q	V				
6+30	0.9036	0.69	Q	V				
6+35	0.9077	0.59	Q	V				
6+40	0.9112	0.51	Q	V				
6+45	0.9143	0.45	Q	V				
6+50	0.9170	0.39	Q	V				
6+55	0.9192	0.33	Q	V				
7+ 0	0.9211	0.28	Q	V				
7+ 5	0.9228	0.24	Q	V				
7+10	0.9241	0.20	Q	V				
7+15	0.9253	0.17	Q	V				
7+20	0.9263	0.14	Q	V				
7+25	0.9271	0.12	Q	V				
7+30	0.9277	0.09	Q	V				
7+35	0.9282	0.07	Q	V				
7+40	0.9285	0.05	Q	V				
7+45	0.9286	0.01	Q	V				
7+50	0.9286	0.00	Q	V				
7+55	0.9286	0.00	Q	V				
8+ 0	0.9286	0.00	Q	V				
8+ 5	0.9286	0.00	Q	V				
8+10	0.9286	0.00	Q	V				

Unit Hydrograph Analysis

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Study date 02/04/22 File: 2995Q100UHE24100.out

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

Program License Serial Number 6145

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

English Units used in output format

Rockefeller - Patterson Commerce Center
Unit Hydrograph for 24 Hour 100 Year Storm Event - Existing Condition
2995q100uhe
cb

Drainage Area = 6.49(Ac.) = 0.010 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 6.49(Ac.) = 0.010 Sq. Mi.
USER Entry of lag time in hours
Lag time = 0.277 Hr.
Lag time = 16.61 Min.
25% of lag time = 4.15 Min.
40% of lag time = 6.64 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]
6.49	1.77	11.49

100 YEAR Area rainfall data:

Area(Ac.) [1]	Rainfall(In) [2]	Weighting[1*2]
6.49	4.50	29.21

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.770 (In)
Area Averaged 100-Year Rainfall = 4.500 (In)

Point rain (area averaged) = 4.500 (In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 4.500 (In)

Sub-Area Data:
Area(Ac.) Runoff Index Impervious %

6.490 78.00 0.000
 Total Area Entered = 6.49(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
78.0	89.8	0.132	0.000	0.132	1.000	0.132
						Sum (F) = 0.132

Area averaged mean soil loss (F) (In/Hr) = 0.132
 Minimum soil loss rate ((In/Hr)) = 0.066
 (for 24 hour storm duration)
 Soil low loss rate (decimal) = 0.900

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

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	30.110	2.914
2	0.167	60.221	10.702
3	0.250	90.331	18.680
4	0.333	120.441	20.183
5	0.417	150.552	12.756
6	0.500	180.662	7.329
7	0.583	210.772	4.748
8	0.667	240.883	3.703
9	0.750	270.993	2.990
10	0.833	301.103	2.485
11	0.917	331.214	1.979
12	1.000	361.324	1.773
13	1.083	391.434	1.419
14	1.167	421.545	1.232
15	1.250	451.655	0.978
16	1.333	481.765	0.930
17	1.417	511.876	0.885
18	1.500	541.986	0.707
19	1.583	572.096	0.630
20	1.667	602.206	0.546
21	1.750	632.317	0.473
22	1.833	662.427	0.411
23	1.917	692.537	0.322
24	2.000	722.648	0.301
25	2.083	752.758	0.301
26	2.167	782.868	0.301
27	2.250	812.979	0.322
		Sum = 100.000	Sum= 6.541

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr)		Effective (In/Hr)
			Max	Low	
1	0.08	0.036	0.234	0.032	0.00
2	0.17	0.036	0.234	0.032	0.00
3	0.25	0.036	0.233	0.032	0.00
4	0.33	0.054	0.232	0.049	0.01
5	0.42	0.054	0.231	0.049	0.01
6	0.50	0.054	0.230	0.049	0.01
7	0.58	0.054	0.229	0.049	0.01
8	0.67	0.054	0.228	0.049	0.01

9	0.75	0.10	0.054	0.227	0.049	0.01
10	0.83	0.13	0.072	0.226	0.065	0.01
11	0.92	0.13	0.072	0.226	0.065	0.01
12	1.00	0.13	0.072	0.225	0.065	0.01
13	1.08	0.10	0.054	0.224	0.049	0.01
14	1.17	0.10	0.054	0.223	0.049	0.01
15	1.25	0.10	0.054	0.222	0.049	0.01
16	1.33	0.10	0.054	0.221	0.049	0.01
17	1.42	0.10	0.054	0.220	0.049	0.01
18	1.50	0.10	0.054	0.219	0.049	0.01
19	1.58	0.10	0.054	0.218	0.049	0.01
20	1.67	0.10	0.054	0.218	0.049	0.01
21	1.75	0.10	0.054	0.217	0.049	0.01
22	1.83	0.13	0.072	0.216	0.065	0.01
23	1.92	0.13	0.072	0.215	0.065	0.01
24	2.00	0.13	0.072	0.214	0.065	0.01
25	2.08	0.13	0.072	0.213	0.065	0.01
26	2.17	0.13	0.072	0.212	0.065	0.01
27	2.25	0.13	0.072	0.211	0.065	0.01
28	2.33	0.13	0.072	0.211	0.065	0.01
29	2.42	0.13	0.072	0.210	0.065	0.01
30	2.50	0.13	0.072	0.209	0.065	0.01
31	2.58	0.17	0.090	0.208	0.081	0.01
32	2.67	0.17	0.090	0.207	0.081	0.01
33	2.75	0.17	0.090	0.206	0.081	0.01
34	2.83	0.17	0.090	0.206	0.081	0.01
35	2.92	0.17	0.090	0.205	0.081	0.01
36	3.00	0.17	0.090	0.204	0.081	0.01
37	3.08	0.17	0.090	0.203	0.081	0.01
38	3.17	0.17	0.090	0.202	0.081	0.01
39	3.25	0.17	0.090	0.201	0.081	0.01
40	3.33	0.17	0.090	0.200	0.081	0.01
41	3.42	0.17	0.090	0.200	0.081	0.01
42	3.50	0.17	0.090	0.199	0.081	0.01
43	3.58	0.17	0.090	0.198	0.081	0.01
44	3.67	0.17	0.090	0.197	0.081	0.01
45	3.75	0.17	0.090	0.196	0.081	0.01
46	3.83	0.20	0.108	0.195	0.097	0.01
47	3.92	0.20	0.108	0.195	0.097	0.01
48	4.00	0.20	0.108	0.194	0.097	0.01
49	4.08	0.20	0.108	0.193	0.097	0.01
50	4.17	0.20	0.108	0.192	0.097	0.01
51	4.25	0.20	0.108	0.191	0.097	0.01
52	4.33	0.23	0.126	0.191	0.113	0.01
53	4.42	0.23	0.126	0.190	0.113	0.01
54	4.50	0.23	0.126	0.189	0.113	0.01
55	4.58	0.23	0.126	0.188	0.113	0.01
56	4.67	0.23	0.126	0.187	0.113	0.01
57	4.75	0.23	0.126	0.186	0.113	0.01
58	4.83	0.27	0.144	0.186	0.130	0.01
59	4.92	0.27	0.144	0.185	0.130	0.01
60	5.00	0.27	0.144	0.184	0.130	0.01
61	5.08	0.20	0.108	0.183	0.097	0.01
62	5.17	0.20	0.108	0.182	0.097	0.01
63	5.25	0.20	0.108	0.182	0.097	0.01
64	5.33	0.23	0.126	0.181	0.113	0.01
65	5.42	0.23	0.126	0.180	0.113	0.01
66	5.50	0.23	0.126	0.179	0.113	0.01
67	5.58	0.27	0.144	0.179	0.130	0.01
68	5.67	0.27	0.144	0.178	0.130	0.01
69	5.75	0.27	0.144	0.177	0.130	0.01
70	5.83	0.27	0.144	0.176	0.130	0.01
71	5.92	0.27	0.144	0.175	0.130	0.01

72	6.00	0.27	0.144	0.175	0.130	0.01
73	6.08	0.30	0.162	0.174	0.146	0.02
74	6.17	0.30	0.162	0.173	0.146	0.02
75	6.25	0.30	0.162	0.172	0.146	0.02
76	6.33	0.30	0.162	0.172	0.146	0.02
77	6.42	0.30	0.162	0.171	0.146	0.02
78	6.50	0.30	0.162	0.170	0.146	0.02
79	6.58	0.33	0.180	0.169	---	0.01
80	6.67	0.33	0.180	0.168	---	0.01
81	6.75	0.33	0.180	0.168	---	0.01
82	6.83	0.33	0.180	0.167	---	0.01
83	6.92	0.33	0.180	0.166	---	0.01
84	7.00	0.33	0.180	0.165	---	0.01
85	7.08	0.33	0.180	0.165	---	0.02
86	7.17	0.33	0.180	0.164	---	0.02
87	7.25	0.33	0.180	0.163	---	0.02
88	7.33	0.37	0.198	0.162	---	0.04
89	7.42	0.37	0.198	0.162	---	0.04
90	7.50	0.37	0.198	0.161	---	0.04
91	7.58	0.40	0.216	0.160	---	0.06
92	7.67	0.40	0.216	0.159	---	0.06
93	7.75	0.40	0.216	0.159	---	0.06
94	7.83	0.43	0.234	0.158	---	0.08
95	7.92	0.43	0.234	0.157	---	0.08
96	8.00	0.43	0.234	0.157	---	0.08
97	8.08	0.50	0.270	0.156	---	0.11
98	8.17	0.50	0.270	0.155	---	0.11
99	8.25	0.50	0.270	0.154	---	0.12
100	8.33	0.50	0.270	0.154	---	0.12
101	8.42	0.50	0.270	0.153	---	0.12
102	8.50	0.50	0.270	0.152	---	0.12
103	8.58	0.53	0.288	0.152	---	0.14
104	8.67	0.53	0.288	0.151	---	0.14
105	8.75	0.53	0.288	0.150	---	0.14
106	8.83	0.57	0.306	0.149	---	0.16
107	8.92	0.57	0.306	0.149	---	0.16
108	9.00	0.57	0.306	0.148	---	0.16
109	9.08	0.63	0.342	0.147	---	0.19
110	9.17	0.63	0.342	0.147	---	0.20
111	9.25	0.63	0.342	0.146	---	0.20
112	9.33	0.67	0.360	0.145	---	0.21
113	9.42	0.67	0.360	0.144	---	0.22
114	9.50	0.67	0.360	0.144	---	0.22
115	9.58	0.70	0.378	0.143	---	0.23
116	9.67	0.70	0.378	0.142	---	0.24
117	9.75	0.70	0.378	0.142	---	0.24
118	9.83	0.73	0.396	0.141	---	0.25
119	9.92	0.73	0.396	0.140	---	0.26
120	10.00	0.73	0.396	0.140	---	0.26
121	10.08	0.50	0.270	0.139	---	0.13
122	10.17	0.50	0.270	0.138	---	0.13
123	10.25	0.50	0.270	0.138	---	0.13
124	10.33	0.50	0.270	0.137	---	0.13
125	10.42	0.50	0.270	0.136	---	0.13
126	10.50	0.50	0.270	0.136	---	0.13
127	10.58	0.67	0.360	0.135	---	0.22
128	10.67	0.67	0.360	0.134	---	0.23
129	10.75	0.67	0.360	0.134	---	0.23
130	10.83	0.67	0.360	0.133	---	0.23
131	10.92	0.67	0.360	0.132	---	0.23
132	11.00	0.67	0.360	0.132	---	0.23
133	11.08	0.63	0.342	0.131	---	0.21
134	11.17	0.63	0.342	0.130	---	0.21

135	11.25	0.63	0.342	0.130	---	0.21
136	11.33	0.63	0.342	0.129	---	0.21
137	11.42	0.63	0.342	0.129	---	0.21
138	11.50	0.63	0.342	0.128	---	0.21
139	11.58	0.57	0.306	0.127	---	0.18
140	11.67	0.57	0.306	0.127	---	0.18
141	11.75	0.57	0.306	0.126	---	0.18
142	11.83	0.60	0.324	0.125	---	0.20
143	11.92	0.60	0.324	0.125	---	0.20
144	12.00	0.60	0.324	0.124	---	0.20
145	12.08	0.83	0.450	0.123	---	0.33
146	12.17	0.83	0.450	0.123	---	0.33
147	12.25	0.83	0.450	0.122	---	0.33
148	12.33	0.87	0.468	0.122	---	0.35
149	12.42	0.87	0.468	0.121	---	0.35
150	12.50	0.87	0.468	0.120	---	0.35
151	12.58	0.93	0.504	0.120	---	0.38
152	12.67	0.93	0.504	0.119	---	0.38
153	12.75	0.93	0.504	0.119	---	0.39
154	12.83	0.97	0.522	0.118	---	0.40
155	12.92	0.97	0.522	0.117	---	0.40
156	13.00	0.97	0.522	0.117	---	0.41
157	13.08	1.13	0.612	0.116	---	0.50
158	13.17	1.13	0.612	0.116	---	0.50
159	13.25	1.13	0.612	0.115	---	0.50
160	13.33	1.13	0.612	0.114	---	0.50
161	13.42	1.13	0.612	0.114	---	0.50
162	13.50	1.13	0.612	0.113	---	0.50
163	13.58	0.77	0.414	0.113	---	0.30
164	13.67	0.77	0.414	0.112	---	0.30
165	13.75	0.77	0.414	0.112	---	0.30
166	13.83	0.77	0.414	0.111	---	0.30
167	13.92	0.77	0.414	0.110	---	0.30
168	14.00	0.77	0.414	0.110	---	0.30
169	14.08	0.90	0.486	0.109	---	0.38
170	14.17	0.90	0.486	0.109	---	0.38
171	14.25	0.90	0.486	0.108	---	0.38
172	14.33	0.87	0.468	0.108	---	0.36
173	14.42	0.87	0.468	0.107	---	0.36
174	14.50	0.87	0.468	0.107	---	0.36
175	14.58	0.87	0.468	0.106	---	0.36
176	14.67	0.87	0.468	0.105	---	0.36
177	14.75	0.87	0.468	0.105	---	0.36
178	14.83	0.83	0.450	0.104	---	0.35
179	14.92	0.83	0.450	0.104	---	0.35
180	15.00	0.83	0.450	0.103	---	0.35
181	15.08	0.80	0.432	0.103	---	0.33
182	15.17	0.80	0.432	0.102	---	0.33
183	15.25	0.80	0.432	0.102	---	0.33
184	15.33	0.77	0.414	0.101	---	0.31
185	15.42	0.77	0.414	0.101	---	0.31
186	15.50	0.77	0.414	0.100	---	0.31
187	15.58	0.63	0.342	0.100	---	0.24
188	15.67	0.63	0.342	0.099	---	0.24
189	15.75	0.63	0.342	0.099	---	0.24
190	15.83	0.63	0.342	0.098	---	0.24
191	15.92	0.63	0.342	0.098	---	0.24
192	16.00	0.63	0.342	0.097	---	0.24
193	16.08	0.13	0.072	0.097	0.065	0.01
194	16.17	0.13	0.072	0.096	0.065	0.01
195	16.25	0.13	0.072	0.096	0.065	0.01
196	16.33	0.13	0.072	0.095	0.065	0.01
197	16.42	0.13	0.072	0.095	0.065	0.01

198	16.50	0.13	0.072	0.094	0.065	0.01
199	16.58	0.10	0.054	0.094	0.049	0.01
200	16.67	0.10	0.054	0.093	0.049	0.01
201	16.75	0.10	0.054	0.093	0.049	0.01
202	16.83	0.10	0.054	0.092	0.049	0.01
203	16.92	0.10	0.054	0.092	0.049	0.01
204	17.00	0.10	0.054	0.091	0.049	0.01
205	17.08	0.17	0.090	0.091	0.081	0.01
206	17.17	0.17	0.090	0.090	0.081	0.01
207	17.25	0.17	0.090	0.090	---	0.00
208	17.33	0.17	0.090	0.090	---	0.00
209	17.42	0.17	0.090	0.089	---	0.00
210	17.50	0.17	0.090	0.089	---	0.00
211	17.58	0.17	0.090	0.088	---	0.00
212	17.67	0.17	0.090	0.088	---	0.00
213	17.75	0.17	0.090	0.087	---	0.00
214	17.83	0.13	0.072	0.087	0.065	0.01
215	17.92	0.13	0.072	0.086	0.065	0.01
216	18.00	0.13	0.072	0.086	0.065	0.01
217	18.08	0.13	0.072	0.086	0.065	0.01
218	18.17	0.13	0.072	0.085	0.065	0.01
219	18.25	0.13	0.072	0.085	0.065	0.01
220	18.33	0.13	0.072	0.084	0.065	0.01
221	18.42	0.13	0.072	0.084	0.065	0.01
222	18.50	0.13	0.072	0.084	0.065	0.01
223	18.58	0.10	0.054	0.083	0.049	0.01
224	18.67	0.10	0.054	0.083	0.049	0.01
225	18.75	0.10	0.054	0.082	0.049	0.01
226	18.83	0.07	0.036	0.082	0.032	0.00
227	18.92	0.07	0.036	0.082	0.032	0.00
228	19.00	0.07	0.036	0.081	0.032	0.00
229	19.08	0.10	0.054	0.081	0.049	0.01
230	19.17	0.10	0.054	0.080	0.049	0.01
231	19.25	0.10	0.054	0.080	0.049	0.01
232	19.33	0.13	0.072	0.080	0.065	0.01
233	19.42	0.13	0.072	0.079	0.065	0.01
234	19.50	0.13	0.072	0.079	0.065	0.01
235	19.58	0.10	0.054	0.079	0.049	0.01
236	19.67	0.10	0.054	0.078	0.049	0.01
237	19.75	0.10	0.054	0.078	0.049	0.01
238	19.83	0.07	0.036	0.078	0.032	0.00
239	19.92	0.07	0.036	0.077	0.032	0.00
240	20.00	0.07	0.036	0.077	0.032	0.00
241	20.08	0.10	0.054	0.076	0.049	0.01
242	20.17	0.10	0.054	0.076	0.049	0.01
243	20.25	0.10	0.054	0.076	0.049	0.01
244	20.33	0.10	0.054	0.075	0.049	0.01
245	20.42	0.10	0.054	0.075	0.049	0.01
246	20.50	0.10	0.054	0.075	0.049	0.01
247	20.58	0.10	0.054	0.075	0.049	0.01
248	20.67	0.10	0.054	0.074	0.049	0.01
249	20.75	0.10	0.054	0.074	0.049	0.01
250	20.83	0.07	0.036	0.074	0.032	0.00
251	20.92	0.07	0.036	0.073	0.032	0.00
252	21.00	0.07	0.036	0.073	0.032	0.00
253	21.08	0.10	0.054	0.073	0.049	0.01
254	21.17	0.10	0.054	0.072	0.049	0.01
255	21.25	0.10	0.054	0.072	0.049	0.01
256	21.33	0.07	0.036	0.072	0.032	0.00
257	21.42	0.07	0.036	0.072	0.032	0.00
258	21.50	0.07	0.036	0.071	0.032	0.00
259	21.58	0.10	0.054	0.071	0.049	0.01
260	21.67	0.10	0.054	0.071	0.049	0.01

261	21.75	0.10	0.054	0.071	0.049	0.01
262	21.83	0.07	0.036	0.070	0.032	0.00
263	21.92	0.07	0.036	0.070	0.032	0.00
264	22.00	0.07	0.036	0.070	0.032	0.00
265	22.08	0.10	0.054	0.070	0.049	0.01
266	22.17	0.10	0.054	0.069	0.049	0.01
267	22.25	0.10	0.054	0.069	0.049	0.01
268	22.33	0.07	0.036	0.069	0.032	0.00
269	22.42	0.07	0.036	0.069	0.032	0.00
270	22.50	0.07	0.036	0.069	0.032	0.00
271	22.58	0.07	0.036	0.068	0.032	0.00
272	22.67	0.07	0.036	0.068	0.032	0.00
273	22.75	0.07	0.036	0.068	0.032	0.00
274	22.83	0.07	0.036	0.068	0.032	0.00
275	22.92	0.07	0.036	0.068	0.032	0.00
276	23.00	0.07	0.036	0.067	0.032	0.00
277	23.08	0.07	0.036	0.067	0.032	0.00
278	23.17	0.07	0.036	0.067	0.032	0.00
279	23.25	0.07	0.036	0.067	0.032	0.00
280	23.33	0.07	0.036	0.067	0.032	0.00
281	23.42	0.07	0.036	0.067	0.032	0.00
282	23.50	0.07	0.036	0.067	0.032	0.00
283	23.58	0.07	0.036	0.067	0.032	0.00
284	23.67	0.07	0.036	0.066	0.032	0.00
285	23.75	0.07	0.036	0.066	0.032	0.00
286	23.83	0.07	0.036	0.066	0.032	0.00
287	23.92	0.07	0.036	0.066	0.032	0.00
288	24.00	0.07	0.036	0.066	0.032	0.00

Sum = 100.0 Sum = 27.6

Flood volume = Effective rainfall 2.30 (In)
times area 6.5(Ac.)/[(In)/(Ft.)] = 1.2 (Ac.Ft)
Total soil loss = 2.20 (In)
Total soil loss = 1.189 (Ac.Ft)
Total rainfall = 4.50 (In)
Flood volume = 54228.6 Cubic Feet
Total soil loss = 51784.2 Cubic Feet

Peak flow rate of this hydrograph = 3.010 (CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0000	0.00	Q				
0+10	0.0000	0.00	Q				
0+15	0.0001	0.01	Q				
0+20	0.0002	0.01	Q				
0+25	0.0003	0.02	Q				
0+30	0.0004	0.02	Q				
0+35	0.0006	0.02	Q				
0+40	0.0008	0.03	Q				
0+45	0.0010	0.03	Q				
0+50	0.0012	0.03	Q				
0+55	0.0014	0.03	Q				
1+ 0	0.0016	0.03	Q				
1+ 5	0.0019	0.04	Q				
1+10	0.0022	0.04	Q				
1+15	0.0024	0.04	Q				

1+20	0.0027	0.04	Q
1+25	0.0029	0.04	Q
1+30	0.0032	0.04	Q
1+35	0.0034	0.04	Q
1+40	0.0036	0.04	Q
1+45	0.0039	0.04	Q
1+50	0.0041	0.04	Q
1+55	0.0044	0.04	Q
2+ 0	0.0047	0.04	Q
2+ 5	0.0049	0.04	Q
2+10	0.0052	0.04	Q
2+15	0.0055	0.04	Q
2+20	0.0058	0.04	Q
2+25	0.0062	0.05	Q
2+30	0.0065	0.05	Q
2+35	0.0068	0.05	Q
2+40	0.0071	0.05	Q
2+45	0.0075	0.05	Q
2+50	0.0078	0.05	Q
2+55	0.0082	0.05	Q
3+ 0	0.0086	0.06	Q
3+ 5	0.0090	0.06	Q
3+10	0.0093	0.06	Q
3+15	0.0097	0.06	Q
3+20	0.0101	0.06	Q
3+25	0.0105	0.06	Q
3+30	0.0109	0.06	Q
3+35	0.0113	0.06	Q
3+40	0.0117	0.06	Q
3+45	0.0121	0.06	Q
3+50	0.0125	0.06	Q
3+55	0.0129	0.06	Q
4+ 0	0.0134	0.06	Q
4+ 5	0.0138	0.06	Q
4+10	0.0143	0.07	Q
4+15	0.0147	0.07	Q
4+20	0.0152	0.07	Q
4+25	0.0157	0.07	Q
4+30	0.0162	0.07	Q
4+35	0.0167	0.08	Q
4+40	0.0172	0.08	Q
4+45	0.0178	0.08	Q
4+50	0.0183	0.08	Q
4+55	0.0189	0.08	Q
5+ 0	0.0194	0.08	Q
5+ 5	0.0200	0.09	Q
5+10	0.0206	0.09	Q
5+15	0.0212	0.08	Q
5+20	0.0217	0.08	Q
5+25	0.0222	0.08	Q
5+30	0.0228	0.08	Q
5+35	0.0233	0.08	Q
5+40	0.0239	0.08	Q
5+45	0.0245	0.09	Q
5+50	0.0251	0.09	Q
5+55	0.0257	0.09	Q
6+ 0	0.0263	0.09	Q
6+ 5	0.0270	0.09	Q
6+10	0.0276	0.09	Q
6+15	0.0283	0.10	Q
6+20	0.0289	0.10	Q
6+25	0.0296	0.10	Q
6+30	0.0303	0.10	Q

6+35	0.0310	0.10	Q				
6+40	0.0317	0.10	QV				
6+45	0.0323	0.09	QV				
6+50	0.0329	0.09	QV				
6+55	0.0335	0.09	QV				
7+ 0	0.0341	0.09	QV				
7+ 5	0.0348	0.09	QV				
7+10	0.0354	0.09	QV				
7+15	0.0360	0.09	QV				
7+20	0.0367	0.10	QV				
7+25	0.0376	0.12	QV				
7+30	0.0385	0.14	QV				
7+35	0.0397	0.18	QV				
7+40	0.0412	0.21	QV				
7+45	0.0428	0.24	QV				
7+50	0.0448	0.28	Q				
7+55	0.0469	0.32	Q				
8+ 0	0.0494	0.35	Q				
8+ 5	0.0521	0.40	Q				
8+10	0.0552	0.45	Q				
8+15	0.0587	0.51	VQ				
8+20	0.0627	0.57	Q				
8+25	0.0669	0.62	Q				
8+30	0.0714	0.65	Q				
8+35	0.0760	0.67	Q				
8+40	0.0808	0.70	Q				
8+45	0.0859	0.74	Q				
8+50	0.0913	0.78	VQ				
8+55	0.0969	0.82	Q				
9+ 0	0.1028	0.86	Q				
9+ 5	0.1091	0.91	Q				
9+10	0.1157	0.96	Q				
9+15	0.1228	1.03	VQ				
9+20	0.1304	1.10	Q				
9+25	0.1383	1.15	Q				
9+30	0.1466	1.21	Q				
9+35	0.1552	1.26	VQ				
9+40	0.1642	1.30	Q				
9+45	0.1735	1.35	Q				
9+50	0.1831	1.40	Q				
9+55	0.1930	1.44	QV				
10+ 0	0.2033	1.49	QV				
10+ 5	0.2137	1.51	Q				
10+10	0.2236	1.45	Q V				
10+15	0.2327	1.32	Q V				
10+20	0.2408	1.17	Q V				
10+25	0.2482	1.08	Q V				
10+30	0.2553	1.03	Q V				
10+35	0.2624	1.02	Q V				
10+40	0.2697	1.07	Q V				
10+45	0.2778	1.16	Q V				
10+50	0.2865	1.27	Q V				
10+55	0.2957	1.34	Q V				
11+ 0	0.3052	1.38	Q V				
11+ 5	0.3148	1.40	Q V				
11+10	0.3245	1.40	Q V				
11+15	0.3341	1.40	Q V				
11+20	0.3436	1.38	Q V				
11+25	0.3531	1.38	Q V				
11+30	0.3626	1.38	Q V				
11+35	0.3721	1.38	Q V				
11+40	0.3814	1.36	Q V				
11+45	0.3905	1.31	Q V				

11+50	0.3993	1.27	Q	V		
11+55	0.4080	1.26	Q	V		
12+ 0	0.4167	1.27	Q	V		
12+ 5	0.4257	1.31	Q	V		
12+10	0.4354	1.41	Q	V		
12+15	0.4462	1.57	Q	V		
12+20	0.4582	1.74	Q	V		
12+25	0.4711	1.86	Q	V		
12+30	0.4845	1.95	Q	V		
12+35	0.4985	2.03	Q	V		
12+40	0.5129	2.10	Q	V		
12+45	0.5280	2.18	Q	V		
12+50	0.5436	2.26	Q	V		
12+55	0.5596	2.33	Q	V		
13+ 0	0.5761	2.39	Q	V		
13+ 5	0.5930	2.46	Q	V		
13+10	0.6107	2.56	Q	V		
13+15	0.6293	2.70	Q	V		
13+20	0.6489	2.85	Q	V		
13+25	0.6691	2.94	Q	V		
13+30	0.6898	3.00	Q	V		
13+35	0.7105	3.01	Q	V		
13+40	0.7306	2.91	Q	V		
13+45	0.7491	2.70	Q	V		
13+50	0.7661	2.46	Q	V		
13+55	0.7821	2.32	Q	V		
14+ 0	0.7975	2.24	Q	V		
14+ 5	0.8128	2.21	Q	V		
14+10	0.8281	2.23	Q	V		
14+15	0.8439	2.30	Q	V		
14+20	0.8602	2.37	Q	V		
14+25	0.8768	2.40	Q	V		
14+30	0.8933	2.40	Q	V		
14+35	0.9097	2.39	Q	V		
14+40	0.9261	2.38	Q	V		
14+45	0.9425	2.38	Q	V		
14+50	0.9589	2.38	Q	V		
14+55	0.9752	2.37	Q	V		
15+ 0	0.9913	2.34	Q	V		
15+ 5	1.0073	2.32	Q	V		
15+10	1.0231	2.29	Q	V		
15+15	1.0387	2.26	Q	V		
15+20	1.0541	2.23	Q	V		
15+25	1.0692	2.20	Q	V		
15+30	1.0842	2.17	Q	V		
15+35	1.0988	2.12	Q	V		
15+40	1.1129	2.05	Q	V		
15+45	1.1264	1.95	Q	V		
15+50	1.1391	1.85	Q	V		
15+55	1.1515	1.79	Q	V		
16+ 0	1.1635	1.75	Q	V		
16+ 5	1.1751	1.68	Q	V		
16+10	1.1854	1.50	Q	V		
16+15	1.1936	1.19	Q	V		
16+20	1.1995	0.86	Q	V		
16+25	1.2040	0.65	Q	V		
16+30	1.2077	0.53	Q	V		
16+35	1.2108	0.45	Q	V		
16+40	1.2134	0.38	Q	V		
16+45	1.2156	0.33	Q	V		
16+50	1.2175	0.28	Q	V		
16+55	1.2192	0.24	Q	V		
17+ 0	1.2206	0.21	Q	V		

17+ 5	1.2219	0.18	Q				V
17+10	1.2230	0.16	Q				V
17+15	1.2241	0.15	Q				V
17+20	1.2250	0.13	Q				V
17+25	1.2257	0.11	Q				V
17+30	1.2263	0.08	Q				V
17+35	1.2267	0.07	Q				V
17+40	1.2271	0.06	Q				V
17+45	1.2274	0.05	Q				V
17+50	1.2277	0.04	Q				V
17+55	1.2280	0.04	Q				V
18+ 0	1.2283	0.04	Q				V
18+ 5	1.2286	0.04	Q				V
18+10	1.2289	0.04	Q				V
18+15	1.2292	0.04	Q				V
18+20	1.2295	0.04	Q				V
18+25	1.2298	0.04	Q				V
18+30	1.2301	0.04	Q				V
18+35	1.2304	0.04	Q				V
18+40	1.2307	0.04	Q				V
18+45	1.2309	0.04	Q				V
18+50	1.2312	0.04	Q				V
18+55	1.2314	0.04	Q				V
19+ 0	1.2317	0.03	Q				V
19+ 5	1.2319	0.03	Q				V
19+10	1.2321	0.03	Q				V
19+15	1.2323	0.03	Q				V
19+20	1.2325	0.03	Q				V
19+25	1.2328	0.04	Q				V
19+30	1.2331	0.04	Q				V
19+35	1.2333	0.04	Q				V
19+40	1.2336	0.04	Q				V
19+45	1.2339	0.04	Q				V
19+50	1.2341	0.04	Q				V
19+55	1.2344	0.04	Q				V
20+ 0	1.2346	0.03	Q				V
20+ 5	1.2348	0.03	Q				V
20+10	1.2350	0.03	Q				V
20+15	1.2353	0.03	Q				V
20+20	1.2355	0.03	Q				V
20+25	1.2357	0.03	Q				V
20+30	1.2359	0.03	Q				V
20+35	1.2362	0.03	Q				V
20+40	1.2364	0.03	Q				V
20+45	1.2367	0.03	Q				V
20+50	1.2369	0.03	Q				V
20+55	1.2371	0.03	Q				V
21+ 0	1.2373	0.03	Q				V
21+ 5	1.2375	0.03	Q				V
21+10	1.2377	0.03	Q				V
21+15	1.2380	0.03	Q				V
21+20	1.2382	0.03	Q				V
21+25	1.2384	0.03	Q				V
21+30	1.2386	0.03	Q				V
21+35	1.2388	0.03	Q				V
21+40	1.2390	0.03	Q				V
21+45	1.2392	0.03	Q				V
21+50	1.2394	0.03	Q				V
21+55	1.2396	0.03	Q				V
22+ 0	1.2398	0.03	Q				V
22+ 5	1.2400	0.03	Q				V
22+10	1.2402	0.03	Q				V
22+15	1.2404	0.03	Q				V

22+20	1.2406	0.03	Q	V
22+25	1.2409	0.03	Q	V
22+30	1.2411	0.03	Q	V
22+35	1.2412	0.03	Q	V
22+40	1.2414	0.03	Q	V
22+45	1.2416	0.03	Q	V
22+50	1.2418	0.03	Q	V
22+55	1.2419	0.02	Q	V
23+ 0	1.2421	0.02	Q	V
23+ 5	1.2423	0.02	Q	V
23+10	1.2425	0.02	Q	V
23+15	1.2426	0.02	Q	V
23+20	1.2428	0.02	Q	V
23+25	1.2430	0.02	Q	V
23+30	1.2431	0.02	Q	V
23+35	1.2433	0.02	Q	V
23+40	1.2434	0.02	Q	V
23+45	1.2436	0.02	Q	V
23+50	1.2438	0.02	Q	V
23+55	1.2439	0.02	Q	V
24+ 0	1.2441	0.02	Q	V
24+ 5	1.2443	0.02	Q	V
24+10	1.2444	0.02	Q	V
24+15	1.2445	0.02	Q	V
24+20	1.2446	0.01	Q	V
24+25	1.2446	0.01	Q	V
24+30	1.2447	0.01	Q	V
24+35	1.2447	0.01	Q	V
24+40	1.2448	0.00	Q	V
24+45	1.2448	0.00	Q	V
24+50	1.2448	0.00	Q	V
24+55	1.2448	0.00	Q	V
25+ 0	1.2448	0.00	Q	V
25+ 5	1.2449	0.00	Q	V
25+10	1.2449	0.00	Q	V
25+15	1.2449	0.00	Q	V
25+20	1.2449	0.00	Q	V
25+25	1.2449	0.00	Q	V
25+30	1.2449	0.00	Q	V
25+35	1.2449	0.00	Q	V
25+40	1.2449	0.00	Q	V
25+45	1.2449	0.00	Q	V
25+50	1.2449	0.00	Q	V
25+55	1.2449	0.00	Q	V
26+ 0	1.2449	0.00	Q	V
26+ 5	1.2449	0.00	Q	V
26+10	1.2449	0.00	Q	V

Unit Hydrograph Analysis

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Study date 07/18/22 File: 2995q100uhp1100.out

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

Program License Serial Number 6145

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

English Units used in output format

Rockefeller - Patterson Commerce Center
Unit Hydrograph for 1 Hour 100 Year Storm Event - Proposed Condition
2995q100uhp
CB

Drainage Area = 14.00 (Ac.) = 0.022 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 14.00 (Ac.) = 0.022 Sq. Mi.
USER Entry of lag time in hours
Lag time = 0.142 Hr.
Lag time = 8.54 Min.
25% of lag time = 2.14 Min.
40% of lag time = 3.42 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]
14.00	0.47	6.58

100 YEAR Area rainfall data:

Area(Ac.) [1]	Rainfall(In) [2]	Weighting[1*2]
14.00	1.24	17.36

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.470 (In)
Area Averaged 100-Year Rainfall = 1.240 (In)

Point rain (area averaged) = 1.240 (In)
Areal adjustment factor = 99.99 %
Adjusted average point rain = 1.240 (In)

Sub-Area Data:
Area(Ac.) Runoff Index Impervious %

14.000 56.00 0.750
 Total Area Entered = 14.00(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	74.8	0.305	0.750	0.099	1.000	0.099
						Sum (F) = 0.099

Area averaged mean soil loss (F) (In/Hr) = 0.099
 Minimum soil loss rate ((In/Hr)) = 0.050
 (for 24 hour storm duration)
 Soil low loss rate (decimal) = 0.300

 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 (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	58.521	7.883
2	0.167	117.041	32.906
3	0.250	175.562	27.050
4	0.333	234.082	10.583
5	0.417	292.603	6.184
6	0.500	351.124	4.200
7	0.583	409.644	3.021
8	0.667	468.165	2.112
9	0.750	526.685	1.735
10	0.833	585.206	1.314
11	0.917	643.727	1.007
12	1.000	702.247	0.733
13	1.083	760.768	0.587
14	1.167	819.288	0.685
		Sum = 100.000	Sum= 14.109

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max Low	Effective (In/Hr)
1	0.08	4.20	0.099 ---	0.53
2	0.17	4.30	0.099 ---	0.54
3	0.25	5.00	0.099 ---	0.64
4	0.33	5.00	0.099 ---	0.64
5	0.42	5.80	0.099 ---	0.76
6	0.50	6.50	0.099 ---	0.87
7	0.58	7.40	0.099 ---	1.00
8	0.67	8.60	0.099 ---	1.18
9	0.75	12.30	0.099 ---	1.73
10	0.83	29.10	0.099 ---	4.23
11	0.92	6.80	0.099 ---	0.91
12	1.00	5.00	0.099 ---	0.64
Sum =	100.0			Sum = 13.7

Flood volume = Effective rainfall 1.14 (In)
 times area 14.0 (Ac.) / [(In)/(Ft.)] = 1.3 (Ac.Ft)
 Total soil loss = 0.10 (In)
 Total soil loss = 0.116 (Ac.Ft)
 Total rainfall = 1.24 (In)
 Flood volume = 57965.3 Cubic Feet

Total soil loss = 5043.5 Cubic Feet

Peak flow rate of this hydrograph = 31.278(CFS)

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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	10.0	20.0	30.0	40.0
0+ 5	0.0040	0.58	Q				
0+10	0.0250	3.04	V Q				
0+15	0.0610	5.24	V Q				
0+20	0.1062	6.56	V Q				
0+25	0.1584	7.57	V Q				
0+30	0.2184	8.72	V Q				
0+35	0.2882	10.13	V Q				
0+40	0.3692	11.75		Q			
0+45	0.4666	14.14		Q			
0+50	0.6089	20.66			V Q		
0+55	0.8243	31.28			V Q		
1+ 0	1.0056	26.33			Q	V	
1+ 5	1.1171	16.19		Q		V	
1+10	1.1857	9.95		Q		V	
1+15	1.2273	6.05		Q		V	
1+20	1.2563	4.22		Q		V	
1+25	1.2772	3.03		Q		V	
1+30	1.2932	2.32		Q		V	
1+35	1.3052	1.74	Q			V	
1+40	1.3141	1.30	Q			V	
1+45	1.3207	0.94	Q			V	
1+50	1.3255	0.70	Q			V	
1+55	1.3293	0.55	Q			V	
2+ 0	1.3303	0.14	Q			V	
2+ 5	1.3307	0.06	Q			V	V

Unit Hydrograph Analysis

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Study date 07/18/22 File: 2995q100uhp3100.out

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

Program License Serial Number 6145

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

English Units used in output format

Rockefeller - Patterson Commerce Center
Unit Hydrograph for 3 Hour 100 Year Storm Event - Proposed Condition
2995q100uhp
CB

Drainage Area = 14.00 (Ac.) = 0.022 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 14.00 (Ac.) = 0.022 Sq. Mi.
USER Entry of lag time in hours
Lag time = 0.142 Hr.
Lag time = 8.54 Min.
25% of lag time = 2.14 Min.
40% of lag time = 3.42 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]
14.00	0.79	11.06

100 YEAR Area rainfall data:

Area(Ac.) [1]	Rainfall(In) [2]	Weighting[1*2]
14.00	1.90	26.60

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 0.790 (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 %

14.000 56.00 0.750
 Total Area Entered = 14.00(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	74.8	0.305	0.750	0.099	1.000	0.099
						Sum (F) = 0.099

Area averaged mean soil loss (F) (In/Hr) = 0.099
 Minimum soil loss rate ((In/Hr)) = 0.050
 (for 24 hour storm duration)
 Soil low loss rate (decimal) = 0.300

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

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	58.521	7.883
2	0.167	117.041	32.906
3	0.250	175.562	27.050
4	0.333	234.082	10.583
5	0.417	292.603	6.184
6	0.500	351.124	4.200
7	0.583	409.644	3.021
8	0.667	468.165	2.112
9	0.750	526.685	1.735
10	0.833	585.206	1.314
11	0.917	643.727	1.007
12	1.000	702.247	0.733
13	1.083	760.768	0.587
14	1.167	819.288	0.685
		Sum = 100.000	Sum= 14.109

Unit Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr)		Effective (In/Hr)
			Max	Low	
1	0.08	1.30	0.296	0.099	0.20
2	0.17	1.30	0.296	0.099	0.20
3	0.25	1.10	0.251	0.099	0.15
4	0.33	1.50	0.342	0.099	0.24
5	0.42	1.50	0.342	0.099	0.24
6	0.50	1.80	0.410	0.099	0.31
7	0.58	1.50	0.342	0.099	0.24
8	0.67	1.80	0.410	0.099	0.31
9	0.75	1.80	0.410	0.099	0.31
10	0.83	1.50	0.342	0.099	0.24
11	0.92	1.60	0.365	0.099	0.27
12	1.00	1.80	0.410	0.099	0.31
13	1.08	2.20	0.502	0.099	0.40
14	1.17	2.20	0.502	0.099	0.40
15	1.25	2.20	0.502	0.099	0.40
16	1.33	2.00	0.456	0.099	0.36
17	1.42	2.60	0.593	0.099	0.49
18	1.50	2.70	0.616	0.099	0.52
19	1.58	2.40	0.547	0.099	0.45
20	1.67	2.70	0.616	0.099	0.52
21	1.75	3.30	0.752	0.099	0.65

22	1.83	3.10	0.707	0.099	---	0.61
23	1.92	2.90	0.661	0.099	---	0.56
24	2.00	3.00	0.684	0.099	---	0.58
25	2.08	3.10	0.707	0.099	---	0.61
26	2.17	4.20	0.958	0.099	---	0.86
27	2.25	5.00	1.140	0.099	---	1.04
28	2.33	3.50	0.798	0.099	---	0.70
29	2.42	6.80	1.550	0.099	---	1.45
30	2.50	7.30	1.664	0.099	---	1.57
31	2.58	8.20	1.869	0.099	---	1.77
32	2.67	5.90	1.345	0.099	---	1.25
33	2.75	2.00	0.456	0.099	---	0.36
34	2.83	1.80	0.410	0.099	---	0.31
35	2.92	1.80	0.410	0.099	---	0.31
36	3.00	0.60	0.137	0.099	---	0.04

Sum = 100.0 Sum = 19.2

Flood volume = Effective rainfall 1.60 (In)
times area 14.0(Ac.)/[(In)/(Ft.)] = 1.9(Ac.Ft)
Total soil loss = 0.30 (In)
Total soil loss = 0.347(Ac.Ft)
Total rainfall = 1.90 (In)
Flood volume = 81421.7 Cubic Feet
Total soil loss = 15130.4 Cubic Feet

Peak flow rate of this hydrograph = 20.015(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	7.5	15.0	22.5	30.0
0+ 5	0.0015	0.22	Q				
0+10	0.0093	1.14	VQ				
0+15	0.0220	1.84	V Q				
0+20	0.0359	2.02	V Q				
0+25	0.0527	2.44	V Q				
0+30	0.0728	2.92	V Q				
0+35	0.0958	3.34	V Q				
0+40	0.1197	3.47	V Q				
0+45	0.1452	3.71	VQ				
0+50	0.1722	3.92	V Q				
0+55	0.1980	3.75	Q				
1+ 0	0.2237	3.73	Q				
1+ 5	0.2518	4.08	Q				
1+10	0.2843	4.71	Q				
1+15	0.3196	5.13	Q				
1+20	0.3558	5.25	Q				
1+25	0.3923	5.31	QV				
1+30	0.4328	5.87	Q V				
1+35	0.4769	6.41	Q V				
1+40	0.5213	6.45	Q V				
1+45	0.5682	6.82	Q V				
1+50	0.6210	7.66	Q V				
1+55	0.6763	8.03	Q V				
2+ 0	0.7311	7.95	Q V				
2+ 5	0.7863	8.02	Q V				
2+10	0.8448	8.50	Q V				
2+15	0.9138	10.01	Q V				
2+20	0.9929	11.50	Q V				

2+25	1.0746	11.86			Q	V		
2+30	1.1760	14.71				Q	V	
2+35	1.3010	18.16					Q	V
2+40	1.4389	20.02					Q	Q
2+45	1.5640	18.17					Q	
2+50	1.6523	12.82			Q			V
2+55	1.7141	8.98						V
3+ 0	1.7630	7.10			Q			V
3+ 5	1.7969	4.93						V
3+10	1.8186	3.14		Q				V
3+15	1.8338	2.21		Q				V
3+20	1.8449	1.62		Q				V
3+25	1.8530	1.17	Q					V
3+30	1.8590	0.88	Q					V
3+35	1.8633	0.62	Q					V
3+40	1.8662	0.42	Q					V
3+45	1.8678	0.23	Q					V
3+50	1.8685	0.10	Q					V
3+55	1.8689	0.06	Q					V
4+ 0	1.8692	0.03	Q					V
4+ 5	1.8692	0.00	Q					V

Unit Hydrograph Analysis

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Study date 07/18/22 File: 2995q100uhp6100.out

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

Program License Serial Number 6145

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

English Units used in output format

Rockefeller - Patterson Commerce Center
Unit Hydrograph for 6 Hour 100 Year Storm Event - Proposed Condition
2995q100uhp
CB

Drainage Area = 14.00 (Ac.) = 0.022 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 14.00 (Ac.) = 0.022 Sq. Mi.
USER Entry of lag time in hours
Lag time = 0.142 Hr.
Lag time = 8.54 Min.
25% of lag time = 2.14 Min.
40% of lag time = 3.42 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]
14.00	1.05	14.70

100 YEAR Area rainfall data:

Area(Ac.) [1]	Rainfall(In) [2]	Weighting[1*2]
14.00	2.50	35.00

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.050 (In)
Area Averaged 100-Year Rainfall = 2.500 (In)

Point rain (area averaged) = 2.500 (In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 2.500 (In)

Sub-Area Data:
Area(Ac.) Runoff Index Impervious %

14.000 56.00 0.750
 Total Area Entered = 14.00(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	74.8	0.305	0.750	0.099	1.000	0.099
						Sum (F) = 0.099

Area averaged mean soil loss (F) (In/Hr) = 0.099
 Minimum soil loss rate ((In/Hr)) = 0.050
 (for 24 hour storm duration)
 Soil low loss rate (decimal) = 0.300

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

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	58.521	7.883
2	0.167	117.041	32.906
3	0.250	175.562	27.050
4	0.333	234.082	10.583
5	0.417	292.603	6.184
6	0.500	351.124	4.200
7	0.583	409.644	3.021
8	0.667	468.165	2.112
9	0.750	526.685	1.735
10	0.833	585.206	1.314
11	0.917	643.727	1.007
12	1.000	702.247	0.733
13	1.083	760.768	0.587
14	1.167	819.288	0.685
		Sum = 100.000	Sum= 14.109

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr)		Effective (In/Hr)
				Max	Low	
1	0.08	0.50	0.150	0.099	---	0.05
2	0.17	0.60	0.180	0.099	---	0.08
3	0.25	0.60	0.180	0.099	---	0.08
4	0.33	0.60	0.180	0.099	---	0.08
5	0.42	0.60	0.180	0.099	---	0.08
6	0.50	0.70	0.210	0.099	---	0.11
7	0.58	0.70	0.210	0.099	---	0.11
8	0.67	0.70	0.210	0.099	---	0.11
9	0.75	0.70	0.210	0.099	---	0.11
10	0.83	0.70	0.210	0.099	---	0.11
11	0.92	0.70	0.210	0.099	---	0.11
12	1.00	0.80	0.240	0.099	---	0.14
13	1.08	0.80	0.240	0.099	---	0.14
14	1.17	0.80	0.240	0.099	---	0.14
15	1.25	0.80	0.240	0.099	---	0.14
16	1.33	0.80	0.240	0.099	---	0.14
17	1.42	0.80	0.240	0.099	---	0.14
18	1.50	0.80	0.240	0.099	---	0.14
19	1.58	0.80	0.240	0.099	---	0.14
20	1.67	0.80	0.240	0.099	---	0.14
21	1.75	0.80	0.240	0.099	---	0.14

22	1.83	0.80	0.240	0.099	---	0.14
23	1.92	0.80	0.240	0.099	---	0.14
24	2.00	0.90	0.270	0.099	---	0.17
25	2.08	0.80	0.240	0.099	---	0.14
26	2.17	0.90	0.270	0.099	---	0.17
27	2.25	0.90	0.270	0.099	---	0.17
28	2.33	0.90	0.270	0.099	---	0.17
29	2.42	0.90	0.270	0.099	---	0.17
30	2.50	0.90	0.270	0.099	---	0.17
31	2.58	0.90	0.270	0.099	---	0.17
32	2.67	0.90	0.270	0.099	---	0.17
33	2.75	1.00	0.300	0.099	---	0.20
34	2.83	1.00	0.300	0.099	---	0.20
35	2.92	1.00	0.300	0.099	---	0.20
36	3.00	1.00	0.300	0.099	---	0.20
37	3.08	1.00	0.300	0.099	---	0.20
38	3.17	1.10	0.330	0.099	---	0.23
39	3.25	1.10	0.330	0.099	---	0.23
40	3.33	1.10	0.330	0.099	---	0.23
41	3.42	1.20	0.360	0.099	---	0.26
42	3.50	1.30	0.390	0.099	---	0.29
43	3.58	1.40	0.420	0.099	---	0.32
44	3.67	1.40	0.420	0.099	---	0.32
45	3.75	1.50	0.450	0.099	---	0.35
46	3.83	1.50	0.450	0.099	---	0.35
47	3.92	1.60	0.480	0.099	---	0.38
48	4.00	1.60	0.480	0.099	---	0.38
49	4.08	1.70	0.510	0.099	---	0.41
50	4.17	1.80	0.540	0.099	---	0.44
51	4.25	1.90	0.570	0.099	---	0.47
52	4.33	2.00	0.600	0.099	---	0.50
53	4.42	2.10	0.630	0.099	---	0.53
54	4.50	2.10	0.630	0.099	---	0.53
55	4.58	2.20	0.660	0.099	---	0.56
56	4.67	2.30	0.690	0.099	---	0.59
57	4.75	2.40	0.720	0.099	---	0.62
58	4.83	2.40	0.720	0.099	---	0.62
59	4.92	2.50	0.750	0.099	---	0.65
60	5.00	2.60	0.780	0.099	---	0.68
61	5.08	3.10	0.930	0.099	---	0.83
62	5.17	3.60	1.080	0.099	---	0.98
63	5.25	3.90	1.170	0.099	---	1.07
64	5.33	4.20	1.260	0.099	---	1.16
65	5.42	4.70	1.410	0.099	---	1.31
66	5.50	5.60	1.680	0.099	---	1.58
67	5.58	1.90	0.570	0.099	---	0.47
68	5.67	0.90	0.270	0.099	---	0.17
69	5.75	0.60	0.180	0.099	---	0.08
70	5.83	0.50	0.150	0.099	---	0.05
71	5.92	0.30	0.090	0.099	0.027	0.06
72	6.00	0.20	0.060	0.099	0.018	0.04

Sum = 100.0 Sum = 23.0

Flood volume = Effective rainfall 1.92 (In)
times area 14.0 (Ac.) / [(In) / (Ft.)] = 2.2 (Ac.Ft)
Total soil loss = 0.58 (In)
Total soil loss = 0.680 (Ac.Ft)
Total rainfall = 2.50 (In)
Flood volume = 97433.0 Cubic Feet
Total soil loss = 29610.9 Cubic Feet

Peak flow rate of this hydrograph = 17.200 (CFS)

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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	5.0	10.0	15.0	20.0
0+ 5	0.0004		0.06	Q				
0+10	0.0026		0.33	Q				
0+15	0.0072		0.66	VQ				
0+20	0.0130		0.85	VQ				
0+25	0.0195		0.94	VQ				
0+30	0.0266		1.03	V Q				
0+35	0.0349		1.21	V Q				
0+40	0.0442		1.35	V Q				
0+45	0.0539		1.42	V Q				
0+50	0.0640		1.46	VQ				
0+55	0.0742		1.49	VQ				
1+ 0	0.0848		1.54	V Q				
1+ 5	0.0966		1.70	V Q				
1+10	0.1092		1.83	V Q				
1+15	0.1221		1.88	VQ				
1+20	0.1353		1.91	VQ				
1+25	0.1486		1.93	VQ				
1+30	0.1620		1.95	VQ				
1+35	0.1755		1.96	Q				
1+40	0.1891		1.97	Q				
1+45	0.2027		1.97	Q				
1+50	0.2163		1.98	Q				
1+55	0.2300		1.98	QV				
2+ 0	0.2439		2.02	Q				
2+ 5	0.2585		2.13	Q				
2+10	0.2732		2.13	Q				
2+15	0.2884		2.20	QV				
2+20	0.3042		2.30	QV				
2+25	0.3203		2.34	QV				
2+30	0.3366		2.36	Q V				
2+35	0.3529		2.37	Q V				
2+40	0.3693		2.38	Q V				
2+45	0.3860		2.42	Q V				
2+50	0.4037		2.57	Q V				
2+55	0.4222		2.69	Q V				
3+ 0	0.4411		2.74	Q V				
3+ 5	0.4601		2.77	Q V				
3+10	0.4795		2.82	Q V				
3+15	0.5000		2.97	Q V				
3+20	0.5213		3.10	Q V				
3+25	0.5432		3.18	Q V				
3+30	0.5665		3.39	Q V				
3+35	0.5920		3.69	Q V				
3+40	0.6196		4.01	Q V				
3+45	0.6488		4.24	Q V				
3+50	0.6796		4.48	Q V				
3+55	0.7119		4.69	Q V				
4+ 0	0.7458		4.92	Q V				
4+ 5	0.7810		5.12	Q V				
4+10	0.8181		5.38	Q V				
4+15	0.8576		5.73	Q V				
4+20	0.8996		6.10	Q V				
4+25	0.9443		6.49	Q V				
4+30	0.9915		6.85	Q V				
4+35	1.0405		7.12	Q V				

4+40	1.0916	7.42			Q	V		
4+45	1.1452	7.78			Q	V		
4+50	1.2013	8.14			Q	V		
4+55	1.2591	8.40			Q	V		
5+ 0	1.3190	8.69			Q	V		
5+ 5	1.3823	9.19			Q	V		
5+10	1.4531	10.28			Q	V		
5+15	1.5341	11.76			Q	V		
5+20	1.6246	13.15			Q	V		
5+25	1.7244	14.48			Q	V		
5+30	1.8360	16.22			Q	V		
5+35	1.9545	17.20			Q	V		
5+40	2.0456	13.23			Q	V		
5+45	2.1022	8.22			Q	V		
5+50	2.1396	5.43		Q				V
5+55	2.1662	3.87		Q				V
6+ 0	2.1867	2.97		Q				V
6+ 5	2.2024	2.28		Q				V
6+10	2.2136	1.63		Q				V
6+15	2.2214	1.13		Q				V
6+20	2.2270	0.81	Q					V
6+25	2.2309	0.57	Q					V
6+30	2.2336	0.39	Q					V
6+35	2.2354	0.26	Q					V
6+40	2.2361	0.10	Q					V
6+45	2.2364	0.05	Q					V
6+50	2.2366	0.02	Q					V
6+55	2.2367	0.01	Q					V
7+ 0	2.2367	0.01	Q					V
7+ 5	2.2368	0.00	Q					V

Unit Hydrograph Analysis

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Study date 07/18/22 File: 2995q100uhp24100.out

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

Program License Serial Number 6145

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

English Units used in output format

Rockefeller - Patterson Commerce Center
Unit Hydrograph for 24 Hour 100 Year Storm Event - Proposed Condition
2995q100uhp
CB

Drainage Area = 14.00 (Ac.) = 0.022 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 14.00 (Ac.) = 0.022 Sq. Mi.
USER Entry of lag time in hours
Lag time = 0.142 Hr.
Lag time = 8.54 Min.
25% of lag time = 2.14 Min.
40% of lag time = 3.42 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]
14.00	1.77	24.78

100 YEAR Area rainfall data:

Area(Ac.) [1]	Rainfall(In) [2]	Weighting[1*2]
14.00	4.50	63.00

STORM EVENT (YEAR) = 100.00
Area Averaged 2-Year Rainfall = 1.770 (In)
Area Averaged 100-Year Rainfall = 4.500 (In)

Point rain (area averaged) = 4.500 (In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 4.500 (In)

Sub-Area Data:
Area(Ac.) Runoff Index Impervious %

14.000 56.00 0.750
 Total Area Entered = 14.00(Ac.)

RI	RI	Infil. Rate	Impervious	Adj. Infil. Rate	Area%	F
AMC2	AMC-3	(In/Hr)	(Dec.%)	(In/Hr)	(Dec.)	(In/Hr)
56.0	74.8	0.305	0.750	0.099	1.000	0.099
						Sum (F) = 0.099

Area averaged mean soil loss (F) (In/Hr) = 0.099
 Minimum soil loss rate ((In/Hr)) = 0.050
 (for 24 hour storm duration)
 Soil low loss rate (decimal) = 0.300

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

Unit Hydrograph Data

Unit time period (hrs)	Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	58.521	7.883
2	0.167	117.041	32.906
3	0.250	175.562	27.050
4	0.333	234.082	10.583
5	0.417	292.603	6.184
6	0.500	351.124	4.200
7	0.583	409.644	3.021
8	0.667	468.165	2.112
9	0.750	526.685	1.735
10	0.833	585.206	1.314
11	0.917	643.727	1.007
12	1.000	702.247	0.733
13	1.083	760.768	0.587
14	1.167	819.288	0.685
		Sum = 100.000	Sum= 14.109

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr)		Effective (In/Hr)
				Max	Low	
1	0.08	0.07	0.036	0.176	0.011	0.03
2	0.17	0.07	0.036	0.175	0.011	0.03
3	0.25	0.07	0.036	0.175	0.011	0.03
4	0.33	0.10	0.054	0.174	0.016	0.04
5	0.42	0.10	0.054	0.173	0.016	0.04
6	0.50	0.10	0.054	0.173	0.016	0.04
7	0.58	0.10	0.054	0.172	0.016	0.04
8	0.67	0.10	0.054	0.171	0.016	0.04
9	0.75	0.10	0.054	0.171	0.016	0.04
10	0.83	0.13	0.072	0.170	0.022	0.05
11	0.92	0.13	0.072	0.169	0.022	0.05
12	1.00	0.13	0.072	0.169	0.022	0.05
13	1.08	0.10	0.054	0.168	0.016	0.04
14	1.17	0.10	0.054	0.167	0.016	0.04
15	1.25	0.10	0.054	0.167	0.016	0.04
16	1.33	0.10	0.054	0.166	0.016	0.04
17	1.42	0.10	0.054	0.165	0.016	0.04
18	1.50	0.10	0.054	0.165	0.016	0.04
19	1.58	0.10	0.054	0.164	0.016	0.04
20	1.67	0.10	0.054	0.163	0.016	0.04
21	1.75	0.10	0.054	0.163	0.016	0.04

22	1.83	0.13	0.072	0.162	0.022	0.05
23	1.92	0.13	0.072	0.161	0.022	0.05
24	2.00	0.13	0.072	0.161	0.022	0.05
25	2.08	0.13	0.072	0.160	0.022	0.05
26	2.17	0.13	0.072	0.159	0.022	0.05
27	2.25	0.13	0.072	0.159	0.022	0.05
28	2.33	0.13	0.072	0.158	0.022	0.05
29	2.42	0.13	0.072	0.157	0.022	0.05
30	2.50	0.13	0.072	0.157	0.022	0.05
31	2.58	0.17	0.090	0.156	0.027	0.06
32	2.67	0.17	0.090	0.155	0.027	0.06
33	2.75	0.17	0.090	0.155	0.027	0.06
34	2.83	0.17	0.090	0.154	0.027	0.06
35	2.92	0.17	0.090	0.154	0.027	0.06
36	3.00	0.17	0.090	0.153	0.027	0.06
37	3.08	0.17	0.090	0.152	0.027	0.06
38	3.17	0.17	0.090	0.152	0.027	0.06
39	3.25	0.17	0.090	0.151	0.027	0.06
40	3.33	0.17	0.090	0.150	0.027	0.06
41	3.42	0.17	0.090	0.150	0.027	0.06
42	3.50	0.17	0.090	0.149	0.027	0.06
43	3.58	0.17	0.090	0.149	0.027	0.06
44	3.67	0.17	0.090	0.148	0.027	0.06
45	3.75	0.17	0.090	0.147	0.027	0.06
46	3.83	0.20	0.108	0.147	0.032	0.08
47	3.92	0.20	0.108	0.146	0.032	0.08
48	4.00	0.20	0.108	0.145	0.032	0.08
49	4.08	0.20	0.108	0.145	0.032	0.08
50	4.17	0.20	0.108	0.144	0.032	0.08
51	4.25	0.20	0.108	0.144	0.032	0.08
52	4.33	0.23	0.126	0.143	0.038	0.09
53	4.42	0.23	0.126	0.142	0.038	0.09
54	4.50	0.23	0.126	0.142	0.038	0.09
55	4.58	0.23	0.126	0.141	0.038	0.09
56	4.67	0.23	0.126	0.141	0.038	0.09
57	4.75	0.23	0.126	0.140	0.038	0.09
58	4.83	0.27	0.144	0.139	---	0.00
59	4.92	0.27	0.144	0.139	---	0.01
60	5.00	0.27	0.144	0.138	---	0.01
61	5.08	0.20	0.108	0.137	0.032	0.08
62	5.17	0.20	0.108	0.137	0.032	0.08
63	5.25	0.20	0.108	0.136	0.032	0.08
64	5.33	0.23	0.126	0.136	0.038	0.09
65	5.42	0.23	0.126	0.135	0.038	0.09
66	5.50	0.23	0.126	0.135	0.038	0.09
67	5.58	0.27	0.144	0.134	---	0.01
68	5.67	0.27	0.144	0.133	---	0.01
69	5.75	0.27	0.144	0.133	---	0.01
70	5.83	0.27	0.144	0.132	---	0.01
71	5.92	0.27	0.144	0.132	---	0.01
72	6.00	0.27	0.144	0.131	---	0.01
73	6.08	0.30	0.162	0.130	---	0.03
74	6.17	0.30	0.162	0.130	---	0.03
75	6.25	0.30	0.162	0.129	---	0.03
76	6.33	0.30	0.162	0.129	---	0.03
77	6.42	0.30	0.162	0.128	---	0.03
78	6.50	0.30	0.162	0.128	---	0.03
79	6.58	0.33	0.180	0.127	---	0.05
80	6.67	0.33	0.180	0.126	---	0.05
81	6.75	0.33	0.180	0.126	---	0.05
82	6.83	0.33	0.180	0.125	---	0.05
83	6.92	0.33	0.180	0.125	---	0.06
84	7.00	0.33	0.180	0.124	---	0.06

85	7.08	0.33	0.180	0.124	---	0.06
86	7.17	0.33	0.180	0.123	---	0.06
87	7.25	0.33	0.180	0.122	---	0.06
88	7.33	0.37	0.198	0.122	---	0.08
89	7.42	0.37	0.198	0.121	---	0.08
90	7.50	0.37	0.198	0.121	---	0.08
91	7.58	0.40	0.216	0.120	---	0.10
92	7.67	0.40	0.216	0.120	---	0.10
93	7.75	0.40	0.216	0.119	---	0.10
94	7.83	0.43	0.234	0.119	---	0.12
95	7.92	0.43	0.234	0.118	---	0.12
96	8.00	0.43	0.234	0.117	---	0.12
97	8.08	0.50	0.270	0.117	---	0.15
98	8.17	0.50	0.270	0.116	---	0.15
99	8.25	0.50	0.270	0.116	---	0.15
100	8.33	0.50	0.270	0.115	---	0.15
101	8.42	0.50	0.270	0.115	---	0.16
102	8.50	0.50	0.270	0.114	---	0.16
103	8.58	0.53	0.288	0.114	---	0.17
104	8.67	0.53	0.288	0.113	---	0.17
105	8.75	0.53	0.288	0.113	---	0.18
106	8.83	0.57	0.306	0.112	---	0.19
107	8.92	0.57	0.306	0.112	---	0.19
108	9.00	0.57	0.306	0.111	---	0.19
109	9.08	0.63	0.342	0.110	---	0.23
110	9.17	0.63	0.342	0.110	---	0.23
111	9.25	0.63	0.342	0.109	---	0.23
112	9.33	0.67	0.360	0.109	---	0.25
113	9.42	0.67	0.360	0.108	---	0.25
114	9.50	0.67	0.360	0.108	---	0.25
115	9.58	0.70	0.378	0.107	---	0.27
116	9.67	0.70	0.378	0.107	---	0.27
117	9.75	0.70	0.378	0.106	---	0.27
118	9.83	0.73	0.396	0.106	---	0.29
119	9.92	0.73	0.396	0.105	---	0.29
120	10.00	0.73	0.396	0.105	---	0.29
121	10.08	0.50	0.270	0.104	---	0.17
122	10.17	0.50	0.270	0.104	---	0.17
123	10.25	0.50	0.270	0.103	---	0.17
124	10.33	0.50	0.270	0.103	---	0.17
125	10.42	0.50	0.270	0.102	---	0.17
126	10.50	0.50	0.270	0.102	---	0.17
127	10.58	0.67	0.360	0.101	---	0.26
128	10.67	0.67	0.360	0.101	---	0.26
129	10.75	0.67	0.360	0.100	---	0.26
130	10.83	0.67	0.360	0.100	---	0.26
131	10.92	0.67	0.360	0.099	---	0.26
132	11.00	0.67	0.360	0.099	---	0.26
133	11.08	0.63	0.342	0.098	---	0.24
134	11.17	0.63	0.342	0.098	---	0.24
135	11.25	0.63	0.342	0.097	---	0.24
136	11.33	0.63	0.342	0.097	---	0.25
137	11.42	0.63	0.342	0.096	---	0.25
138	11.50	0.63	0.342	0.096	---	0.25
139	11.58	0.57	0.306	0.095	---	0.21
140	11.67	0.57	0.306	0.095	---	0.21
141	11.75	0.57	0.306	0.095	---	0.21
142	11.83	0.60	0.324	0.094	---	0.23
143	11.92	0.60	0.324	0.094	---	0.23
144	12.00	0.60	0.324	0.093	---	0.23
145	12.08	0.83	0.450	0.093	---	0.36
146	12.17	0.83	0.450	0.092	---	0.36
147	12.25	0.83	0.450	0.092	---	0.36

148	12.33	0.87	0.468	0.091	---	0.38
149	12.42	0.87	0.468	0.091	---	0.38
150	12.50	0.87	0.468	0.090	---	0.38
151	12.58	0.93	0.504	0.090	---	0.41
152	12.67	0.93	0.504	0.089	---	0.41
153	12.75	0.93	0.504	0.089	---	0.42
154	12.83	0.97	0.522	0.089	---	0.43
155	12.92	0.97	0.522	0.088	---	0.43
156	13.00	0.97	0.522	0.088	---	0.43
157	13.08	1.13	0.612	0.087	---	0.52
158	13.17	1.13	0.612	0.087	---	0.53
159	13.25	1.13	0.612	0.086	---	0.53
160	13.33	1.13	0.612	0.086	---	0.53
161	13.42	1.13	0.612	0.085	---	0.53
162	13.50	1.13	0.612	0.085	---	0.53
163	13.58	0.77	0.414	0.085	---	0.33
164	13.67	0.77	0.414	0.084	---	0.33
165	13.75	0.77	0.414	0.084	---	0.33
166	13.83	0.77	0.414	0.083	---	0.33
167	13.92	0.77	0.414	0.083	---	0.33
168	14.00	0.77	0.414	0.082	---	0.33
169	14.08	0.90	0.486	0.082	---	0.40
170	14.17	0.90	0.486	0.082	---	0.40
171	14.25	0.90	0.486	0.081	---	0.40
172	14.33	0.87	0.468	0.081	---	0.39
173	14.42	0.87	0.468	0.080	---	0.39
174	14.50	0.87	0.468	0.080	---	0.39
175	14.58	0.87	0.468	0.080	---	0.39
176	14.67	0.87	0.468	0.079	---	0.39
177	14.75	0.87	0.468	0.079	---	0.39
178	14.83	0.83	0.450	0.078	---	0.37
179	14.92	0.83	0.450	0.078	---	0.37
180	15.00	0.83	0.450	0.078	---	0.37
181	15.08	0.80	0.432	0.077	---	0.35
182	15.17	0.80	0.432	0.077	---	0.36
183	15.25	0.80	0.432	0.076	---	0.36
184	15.33	0.77	0.414	0.076	---	0.34
185	15.42	0.77	0.414	0.076	---	0.34
186	15.50	0.77	0.414	0.075	---	0.34
187	15.58	0.63	0.342	0.075	---	0.27
188	15.67	0.63	0.342	0.074	---	0.27
189	15.75	0.63	0.342	0.074	---	0.27
190	15.83	0.63	0.342	0.074	---	0.27
191	15.92	0.63	0.342	0.073	---	0.27
192	16.00	0.63	0.342	0.073	---	0.27
193	16.08	0.13	0.072	0.073	0.022	0.05
194	16.17	0.13	0.072	0.072	0.022	0.05
195	16.25	0.13	0.072	0.072	---	0.00
196	16.33	0.13	0.072	0.071	---	0.00
197	16.42	0.13	0.072	0.071	---	0.00
198	16.50	0.13	0.072	0.071	---	0.00
199	16.58	0.10	0.054	0.070	0.016	0.04
200	16.67	0.10	0.054	0.070	0.016	0.04
201	16.75	0.10	0.054	0.070	0.016	0.04
202	16.83	0.10	0.054	0.069	0.016	0.04
203	16.92	0.10	0.054	0.069	0.016	0.04
204	17.00	0.10	0.054	0.069	0.016	0.04
205	17.08	0.17	0.090	0.068	---	0.02
206	17.17	0.17	0.090	0.068	---	0.02
207	17.25	0.17	0.090	0.068	---	0.02
208	17.33	0.17	0.090	0.067	---	0.02
209	17.42	0.17	0.090	0.067	---	0.02
210	17.50	0.17	0.090	0.067	---	0.02

211	17.58	0.17	0.090	0.066	---	0.02
212	17.67	0.17	0.090	0.066	---	0.02
213	17.75	0.17	0.090	0.066	---	0.02
214	17.83	0.13	0.072	0.065	---	0.01
215	17.92	0.13	0.072	0.065	---	0.01
216	18.00	0.13	0.072	0.065	---	0.01
217	18.08	0.13	0.072	0.064	---	0.01
218	18.17	0.13	0.072	0.064	---	0.01
219	18.25	0.13	0.072	0.064	---	0.01
220	18.33	0.13	0.072	0.063	---	0.01
221	18.42	0.13	0.072	0.063	---	0.01
222	18.50	0.13	0.072	0.063	---	0.01
223	18.58	0.10	0.054	0.062	0.016	0.04
224	18.67	0.10	0.054	0.062	0.016	0.04
225	18.75	0.10	0.054	0.062	0.016	0.04
226	18.83	0.07	0.036	0.061	0.011	0.03
227	18.92	0.07	0.036	0.061	0.011	0.03
228	19.00	0.07	0.036	0.061	0.011	0.03
229	19.08	0.10	0.054	0.061	0.016	0.04
230	19.17	0.10	0.054	0.060	0.016	0.04
231	19.25	0.10	0.054	0.060	0.016	0.04
232	19.33	0.13	0.072	0.060	---	0.01
233	19.42	0.13	0.072	0.059	---	0.01
234	19.50	0.13	0.072	0.059	---	0.01
235	19.58	0.10	0.054	0.059	0.016	0.04
236	19.67	0.10	0.054	0.059	0.016	0.04
237	19.75	0.10	0.054	0.058	0.016	0.04
238	19.83	0.07	0.036	0.058	0.011	0.03
239	19.92	0.07	0.036	0.058	0.011	0.03
240	20.00	0.07	0.036	0.058	0.011	0.03
241	20.08	0.10	0.054	0.057	0.016	0.04
242	20.17	0.10	0.054	0.057	0.016	0.04
243	20.25	0.10	0.054	0.057	0.016	0.04
244	20.33	0.10	0.054	0.057	0.016	0.04
245	20.42	0.10	0.054	0.056	0.016	0.04
246	20.50	0.10	0.054	0.056	0.016	0.04
247	20.58	0.10	0.054	0.056	0.016	0.04
248	20.67	0.10	0.054	0.056	0.016	0.04
249	20.75	0.10	0.054	0.055	0.016	0.04
250	20.83	0.07	0.036	0.055	0.011	0.03
251	20.92	0.07	0.036	0.055	0.011	0.03
252	21.00	0.07	0.036	0.055	0.011	0.03
253	21.08	0.10	0.054	0.055	0.016	0.04
254	21.17	0.10	0.054	0.054	0.016	0.04
255	21.25	0.10	0.054	0.054	0.016	0.04
256	21.33	0.07	0.036	0.054	0.011	0.03
257	21.42	0.07	0.036	0.054	0.011	0.03
258	21.50	0.07	0.036	0.054	0.011	0.03
259	21.58	0.10	0.054	0.053	---	0.00
260	21.67	0.10	0.054	0.053	---	0.00
261	21.75	0.10	0.054	0.053	---	0.00
262	21.83	0.07	0.036	0.053	0.011	0.03
263	21.92	0.07	0.036	0.053	0.011	0.03
264	22.00	0.07	0.036	0.052	0.011	0.03
265	22.08	0.10	0.054	0.052	---	0.00
266	22.17	0.10	0.054	0.052	---	0.00
267	22.25	0.10	0.054	0.052	---	0.00
268	22.33	0.07	0.036	0.052	0.011	0.03
269	22.42	0.07	0.036	0.052	0.011	0.03
270	22.50	0.07	0.036	0.051	0.011	0.03
271	22.58	0.07	0.036	0.051	0.011	0.03
272	22.67	0.07	0.036	0.051	0.011	0.03
273	22.75	0.07	0.036	0.051	0.011	0.03

274	22.83	0.07	0.036	0.051	0.011	0.03
275	22.92	0.07	0.036	0.051	0.011	0.03
276	23.00	0.07	0.036	0.051	0.011	0.03
277	23.08	0.07	0.036	0.050	0.011	0.03
278	23.17	0.07	0.036	0.050	0.011	0.03
279	23.25	0.07	0.036	0.050	0.011	0.03
280	23.33	0.07	0.036	0.050	0.011	0.03
281	23.42	0.07	0.036	0.050	0.011	0.03
282	23.50	0.07	0.036	0.050	0.011	0.03
283	23.58	0.07	0.036	0.050	0.011	0.03
284	23.67	0.07	0.036	0.050	0.011	0.03
285	23.75	0.07	0.036	0.050	0.011	0.03
286	23.83	0.07	0.036	0.050	0.011	0.03
287	23.92	0.07	0.036	0.050	0.011	0.03
288	24.00	0.07	0.036	0.050	0.011	0.03

Sum = 100.0 Sum = 36.4

Flood volume = Effective rainfall 3.04 (In)
times area 14.0(Ac.)/[(In)/(Ft.)] = 3.5(Ac.Ft)
Total soil loss = 1.46(In)
Total soil loss = 1.707(Ac.Ft)
Total rainfall = 4.50(In)
Flood volume = 154309.1 Cubic Feet
Total soil loss = 74374.7 Cubic Feet

Peak flow rate of this hydrograph = 7.264(CFS)

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

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0002	0.03	Q				
0+10	0.0012	0.15	Q				
0+15	0.0029	0.24	Q				
0+20	0.0049	0.29	VQ				
0+25	0.0074	0.37	VQ				
0+30	0.0105	0.44	VQ				
0+35	0.0137	0.47	VQ				
0+40	0.0170	0.48	VQ				
0+45	0.0204	0.50	VQ				
0+50	0.0240	0.52	V Q				
0+55	0.0281	0.59	V Q				
1+ 0	0.0325	0.64	V Q				
1+ 5	0.0370	0.65	V Q				
1+10	0.0412	0.61	V Q				
1+15	0.0451	0.57	V Q				
1+20	0.0489	0.56	V Q				
1+25	0.0527	0.55	V Q				
1+30	0.0565	0.55	V Q				
1+35	0.0602	0.54	V Q				
1+40	0.0639	0.54	V Q				
1+45	0.0676	0.54	V Q				
1+50	0.0714	0.55	V Q				
1+55	0.0756	0.61	V Q				
2+ 0	0.0802	0.66	V Q				
2+ 5	0.0848	0.67	V Q				
2+10	0.0895	0.68	VQ				
2+15	0.0943	0.69	VQ				
2+20	0.0991	0.70	VQ				

2+25	0.1039	0.70	VQ
2+30	0.1088	0.70	VQ
2+35	0.1137	0.72	VQ
2+40	0.1191	0.78	V Q
2+45	0.1248	0.83	V Q
2+50	0.1307	0.85	V Q
2+55	0.1366	0.86	V Q
3+ 0	0.1426	0.87	V Q
3+ 5	0.1486	0.87	V Q
3+10	0.1547	0.88	V Q
3+15	0.1607	0.88	V Q
3+20	0.1668	0.88	V Q
3+25	0.1729	0.89	V Q
3+30	0.1790	0.89	VQ
3+35	0.1851	0.89	VQ
3+40	0.1913	0.89	VQ
3+45	0.1974	0.89	VQ
3+50	0.2036	0.90	VQ
3+55	0.2102	0.96	VQ
4+ 0	0.2172	1.01	V Q
4+ 5	0.2243	1.03	V Q
4+10	0.2314	1.04	V Q
4+15	0.2387	1.05	V Q
4+20	0.2460	1.07	V Q
4+25	0.2538	1.13	V Q
4+30	0.2619	1.18	V Q
4+35	0.2702	1.20	VQ
4+40	0.2785	1.21	VQ
4+45	0.2870	1.22	VQ
4+50	0.2948	1.14	VQ
4+55	0.3000	0.75	Q
5+ 0	0.3030	0.44	Q V
5+ 5	0.3058	0.40	Q V
5+10	0.3103	0.66	QV
5+15	0.3164	0.88	Q
5+20	0.3230	0.96	Q
5+25	0.3303	1.06	VQ
5+30	0.3380	1.13	VQ
5+35	0.3454	1.07	VQ
5+40	0.3505	0.73	QV
5+45	0.3536	0.45	Q V
5+50	0.3560	0.35	Q V
5+55	0.3581	0.30	Q V
6+ 0	0.3599	0.27	Q V
6+ 5	0.3618	0.27	Q V
6+10	0.3642	0.35	Q V
6+15	0.3670	0.41	Q V
6+20	0.3699	0.43	Q V
6+25	0.3730	0.44	Q V
6+30	0.3761	0.45	Q V
6+35	0.3794	0.48	Q V
6+40	0.3833	0.57	Q V
6+45	0.3878	0.65	Q V
6+50	0.3925	0.69	Q V
6+55	0.3975	0.72	Q V
7+ 0	0.4025	0.74	Q V
7+ 5	0.4077	0.75	QV
7+10	0.4130	0.77	QV
7+15	0.4184	0.78	QV
7+20	0.4240	0.81	QV
7+25	0.4302	0.91	QV
7+30	0.4370	0.99	QV
7+35	0.4442	1.04	QV

7+40	0.4521	1.15	QV			
7+45	0.4606	1.24	QV			
7+50	0.4696	1.30	Q			
7+55	0.4793	1.41	Q			
8+ 0	0.4897	1.50	VQ			
8+ 5	0.5006	1.59	VQ			
8+10	0.5130	1.79	V Q			
8+15	0.5264	1.95	V Q			
8+20	0.5403	2.02	V Q			
8+25	0.5546	2.07	V Q			
8+30	0.5691	2.11	V Q			
8+35	0.5840	2.16	V Q			
8+40	0.5996	2.26	V Q			
8+45	0.6157	2.35	V Q			
8+50	0.6324	2.41	V Q			
8+55	0.6498	2.53	V Q			
9+ 0	0.6678	2.62	V Q			
9+ 5	0.6864	2.70	V Q			
9+10	0.7064	2.90	V Q			
9+15	0.7274	3.06	V Q			
9+20	0.7492	3.15	V Q			
9+25	0.7718	3.28	V Q			
9+30	0.7951	3.39	V Q			
9+35	0.8189	3.46	V Q			
9+40	0.8436	3.58	V Q			
9+45	0.8690	3.68	V Q			
9+50	0.8948	3.75	V Q			
9+55	0.9215	3.87	V Q			
10+ 0	0.9488	3.96	V Q			
10+ 5	0.9754	3.87	V Q			
10+10	0.9983	3.32	V Q			
10+15	1.0180	2.86	Q			
10+20	1.0366	2.70	QV			
10+25	1.0545	2.60	QV			
10+30	1.0720	2.54	Q V			
10+35	1.0899	2.60	Q V			
10+40	1.1105	2.99	QV			
10+45	1.1333	3.31	VQ			
10+50	1.1570	3.43	Q			
10+55	1.1811	3.50	VQ			
11+ 0	1.2055	3.55	VQ			
11+ 5	1.2301	3.56	VQ			
11+10	1.2542	3.50	Q			
11+15	1.2781	3.46	QV			
11+20	1.3019	3.46	QV			
11+25	1.3257	3.46	QV			
11+30	1.3496	3.47	Q V			
11+35	1.3733	3.43	Q V			
11+40	1.3958	3.28	Q V			
11+45	1.4175	3.14	Q V			
11+50	1.4389	3.11	Q V			
11+55	1.4607	3.17	Q V			
12+ 0	1.4829	3.22	Q V			
12+ 5	1.5062	3.38	Q V			
12+10	1.5335	3.97	Q V			
12+15	1.5643	4.46	Q			
12+20	1.5965	4.68	Q			
12+25	1.6301	4.88	VQ			
12+30	1.6647	5.03	V Q			
12+35	1.7002	5.16	VQ			
12+40	1.7373	5.38	V Q			
12+45	1.7757	5.57	V Q			
12+50	1.8148	5.68	V Q			

12+55	1.8549	5.83				V	Q		
13+ 0	1.8959	5.94				V	Q		
13+ 5	1.9379	6.11				V	Q		
13+10	1.9832	6.57				V	Q		
13+15	2.0310	6.94				V	Q		
13+20	2.0799	7.10				V	Q		
13+25	2.1294	7.20				V	Q		
13+30	2.1795	7.26				V	Q		
13+35	2.2283	7.09				V	Q		
13+40	2.2711	6.21				QV	Q		
13+45	2.3089	5.49				Q	V		
13+50	2.3448	5.22				Q	V		
13+55	2.3797	5.06				Q	V		
14+ 0	2.4139	4.96				Q	V		
14+ 5	2.4481	4.97				Q	V		
14+10	2.4843	5.26				Q	V		
14+15	2.5222	5.49				Q	V		
14+20	2.5604	5.55				Q	V		
14+25	2.5983	5.51				Q	V		
14+30	2.6360	5.47				Q	V		
14+35	2.6736	5.46				Q	V		
14+40	2.7111	5.45				Q	V		
14+45	2.7488	5.46				Q	V		
14+50	2.7863	5.46				Q	V		
14+55	2.8234	5.38				Q	V		
15+ 0	2.8601	5.32				Q	V		
15+ 5	2.8965	5.28				Q	V		
15+10	2.9323	5.20				Q	V		
15+15	2.9675	5.12				Q	V		
15+20	3.0024	5.07				Q	V		
15+25	3.0366	4.97				Q	V		
15+30	3.0703	4.89				Q	V		
15+35	3.1032	4.78				Q	V		
15+40	3.1337	4.43				Q	V		
15+45	3.1622	4.14				Q	V		
15+50	3.1899	4.02				Q	V		
15+55	3.2172	3.96				Q	V		
16+ 0	3.2441	3.91				Q	V		
16+ 5	3.2692	3.64				Q	V		
16+10	3.2871	2.60			Q		V		
16+15	3.2987	1.69			Q		V		
16+20	3.3064	1.12			Q		V		
16+25	3.3115	0.73			Q		V		
16+30	3.3150	0.52			Q		V		
16+35	3.3179	0.42			Q		V		
16+40	3.3213	0.49			Q		V		
16+45	3.3251	0.56			Q		V		
16+50	3.3290	0.56			Q		V		
16+55	3.3327	0.55			Q		V		
17+ 0	3.3364	0.54			Q		V		
17+ 5	3.3399	0.51			Q		V		
17+10	3.3428	0.42			Q		V		
17+15	3.3453	0.36			Q		V		
17+20	3.3477	0.35			Q		V		
17+25	3.3501	0.34			Q		V		
17+30	3.3524	0.34			Q		V		
17+35	3.3547	0.34			Q		V		
17+40	3.3571	0.34			Q		V		
17+45	3.3595	0.34			Q		V		
17+50	3.3617	0.33			Q		V		
17+55	3.3634	0.24			Q		V		
18+ 0	3.3646	0.18			Q		V		
18+ 5	3.3657	0.15			Q		V		

18+10	3.3667	0.14	Q	V
18+15	3.3676	0.14	Q	V
18+20	3.3685	0.13	Q	V
18+25	3.3694	0.13	Q	V
18+30	3.3703	0.13	Q	V
18+35	3.3714	0.16	Q	V
18+40	3.3735	0.30	Q	V
18+45	3.3763	0.40	Q	V
18+50	3.3792	0.43	Q	V
18+55	3.3820	0.40	Q	V
19+ 0	3.3845	0.37	Q	V
19+ 5	3.3871	0.37	Q	V
19+10	3.3900	0.43	Q	V
19+15	3.3933	0.48	Q	V
19+20	3.3966	0.47	Q	V
19+25	3.3991	0.36	Q	V
19+30	3.4009	0.27	Q	V
19+35	3.4028	0.27	Q	V
19+40	3.4054	0.37	Q	V
19+45	3.4085	0.45	Q	V
19+50	3.4117	0.47	Q	V
19+55	3.4146	0.42	Q	V
20+ 0	3.4173	0.39	Q	V
20+ 5	3.4200	0.39	Q	V
20+10	3.4230	0.44	Q	V
20+15	3.4264	0.49	Q	V
20+20	3.4298	0.50	Q	V
20+25	3.4333	0.51	Q	V
20+30	3.4369	0.52	Q	V
20+35	3.4405	0.52	Q	V
20+40	3.4441	0.53	Q	V
20+45	3.4477	0.53	Q	V
20+50	3.4513	0.52	Q	V
20+55	3.4544	0.46	Q	V
21+ 0	3.4573	0.41	Q	V
21+ 5	3.4601	0.41	Q	V
21+10	3.4632	0.46	Q	V
21+15	3.4666	0.50	Q	V
21+20	3.4700	0.50	Q	V
21+25	3.4731	0.44	Q	V
21+30	3.4759	0.40	Q	V
21+35	3.4783	0.36	Q	V
21+40	3.4799	0.23	Q	V
21+45	3.4809	0.14	Q	V
21+50	3.4817	0.12	Q	V
21+55	3.4832	0.21	Q	V
22+ 0	3.4852	0.29	Q	V
22+ 5	3.4872	0.29	Q	V
22+10	3.4885	0.19	Q	V
22+15	3.4893	0.11	Q	V
22+20	3.4900	0.11	Q	V
22+25	3.4914	0.20	Q	V
22+30	3.4933	0.28	Q	V
22+35	3.4954	0.30	Q	V
22+40	3.4976	0.32	Q	V
22+45	3.4998	0.33	Q	V
22+50	3.5022	0.34	Q	V
22+55	3.5045	0.34	Q	V
23+ 0	3.5069	0.35	Q	V
23+ 5	3.5093	0.35	Q	V
23+10	3.5117	0.35	Q	V
23+15	3.5141	0.35	Q	V
23+20	3.5165	0.35	Q	V

23+25	3.5190	0.36	Q			V
23+30	3.5214	0.36	Q			V
23+35	3.5239	0.36	Q			V
23+40	3.5263	0.36	Q			V
23+45	3.5288	0.36	Q			V
23+50	3.5312	0.36	Q			V
23+55	3.5337	0.36	Q			V
24+ 0	3.5361	0.36	Q			V
24+ 5	3.5384	0.33	Q			V
24+10	3.5399	0.21	Q			V
24+15	3.5406	0.11	Q			V
24+20	3.5412	0.08	Q			V
24+25	3.5415	0.05	Q			V
24+30	3.5418	0.04	Q			V
24+35	3.5420	0.03	Q			V
24+40	3.5422	0.02	Q			V
24+45	3.5423	0.02	Q			V
24+50	3.5424	0.01	Q			V
24+55	3.5424	0.01	Q			V
25+ 0	3.5424	0.00	Q			V
25+ 5	3.5424	0.00	Q			V

Appendix D

Detention Routing Calculations

**Patterson Commerce Center
Basin Routing Study Summary**

Stage Storage Table

#	Depth	Elevation	Area (sf)	Incremental volume (cf)	Total Volume (cf)	Total Volume (acre-ft)	Outflow Q	Notes
1	0.00	1,492.20	0	0	0	-	0.00	Invert of 6" outlet pipe
2	0.80	1,493.00	19,956	3,193	3,193	0.073	0.63	**Bottom of the rock
3	1.80	1,494.00	19,956	7,982	11,175	0.257	1.14	**Top of the rock / Bottom of Eng. Media
4	2.80	1,495.00	19,956	5,987	17,162	0.394	1.48	
5	3.80	1,496.00	19,956	5,987	23,149	0.531	1.76	
6	4.80	1,497.00	19,956	5,987	29,136	0.669	1.99	**Top of Eng. Media / Bottom of Basin
7	5.30	1,497.50	21,565	10,380	39,516	0.907	2.10	*Outlet TG / Basin WQMP Volume
8	5.80	1,498.00	23,200	11,191	40,327	0.926	2.21	
9	6.80	1,499.00	26,544	24,872	65,199	1.497	2.40	
10	7.80	1,500.00	29,989	28,267	93,466	2.146	2.58	
11	8.80	1,501.00	33,535	31,762	96,961	2.226	2.75	
12	9.80	1,502.00	37,197	35,366	128,832	2.958	2.90	Top of the basin

*WQMP Design Capture Volume is 22,194 CF

**Rock = 40% voids, Eng. Media = 30% voids

System releases water after basin volume reaches 39,516 CF

	Orifice Qout 6" pipe
1,492.20	0.00
1,493.00	0.63
1,494.00	1.14
1,495.00	1.48
1,496.00	1.76
1,497.00	1.99
1,497.50	2.10
1,498.00	2.21
1,499.00	2.40
1,500.00	2.58
1,501.00	2.75
1,502.00	2.90

$$Q \text{ OutFlow} = CA \times (2gh)^{(1/2)}$$

$$= 0.6A \times (64.4xh)^{(1/2)}$$

A = Proposed 6" Outlet Pipe = $3.141 \times 0.25^2 = 0.196 \text{ ft}^2$
h = Water Height Above Middle of Outlet Invert

Example: WSE @ 1,493
= $0.6 \times (0.196) \times [64.4 \times (1493 - 1492.55)]^{(1/2)}$
= 0.63 cfs

Q out from bioretention basin

Basin A Routing Summary Table

100 YEAR STORM	1 Hour	3 Hour	6 Hour	24 Hour
Existing Q Out (CFS)	10.3	7.7	6.6	3.0
Max. Q Out (CFS) after WSE	2.3	2.4	2.4	2.4
	1498.33	1498.92	1499.09	1499.27

Note:

1. Peak discharge of 2.4 CFS occurs during the 100 year 24 hour event, which is less than the existing Q out 3.0 CFS.
2. WSE is 1499.27 for 100 year storm.

*From Unit Hydrograph Study for Existing Condition

**From Routing Study

FLOOD HYDROGRAPH ROUTING PROGRAM
 Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
 Study date: 10/14/22

 Rockefeller - Patterson Commerce Center
 Basin Routing Study - 1 Hour 100 Year Storm
 2995routing1100
 CB

Program License Serial Number 6145

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

From study/file name: 2995q100uhp1100.rte
 *****HYDROGRAPH DATA*****
 Number of intervals = 25
 Time interval = 5.0 (Min.)
 Maximum/Peak flow rate = 31.278 (CFS)
 Total volume = 1.331 (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

+++++
 Process from Point/Station 1.000 to Point/Station 1.000
 **** RETARDING BASIN ROUTING ****

 User entry of depth-outflow-storage data

 Total number of inflow hydrograph intervals = 25
 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
0.800	0.073	0.630	0.071	0.075
1.800	0.257	1.140	0.253	0.261
2.800	0.394	1.480	0.389	0.399
3.800	0.531	1.760	0.525	0.537
4.800	0.669	1.990	0.662	0.676
5.300	0.907	2.100	0.900	0.914
5.800	0.926	2.210	0.918	0.934
6.800	1.497	2.400	1.489	1.505
7.800	2.146	2.580	2.137	2.155

8.800	2.226	2.750	2.217	2.235
9.800	2.958	2.900	2.948	2.968

Hydrograph Detention Basin Routing

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

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)		7.8	15.64	23.46	31.28	Depth (Ft.)
0.083	0.58	0.02	0.002	O					0.02
0.167	3.04	0.12	0.014	O I					0.15
0.250	5.24	0.35	0.041	O I					0.45
0.333	6.56	0.64	0.078	O I					0.83
0.417	7.57	0.77	0.122	O I					1.07
0.500	8.72	0.91	0.172	O I					1.34
0.583	10.13	1.07	0.230	O I					1.66
0.667	11.75	1.24	0.298	O I					2.10
0.750	14.14	1.44	0.378	O I					2.68
0.833	20.66	1.67	0.487	O I					3.48
0.917	31.28	1.96	0.653	O I					4.69
1.000	26.33	2.07	0.838	O I					5.15
1.083	16.19	2.22	0.969	O I					5.88
1.167	9.95	2.25	1.044	O I					6.01
1.250	6.05	2.26	1.084	O I					6.08
1.333	4.22	2.27	1.103	O I					6.11
1.417	3.03	2.27	1.113	O I					6.13
1.500	2.32	2.27	1.115	O					6.13
1.583	1.74	2.27	1.114	IO					6.13
1.667	1.30	2.27	1.108	IO					6.12
1.750	0.94	2.27	1.101	I O					6.11
1.833	0.70	2.26	1.091	I O					6.09
1.917	0.55	2.26	1.079	I O					6.07
2.000	0.14	2.26	1.066	I O					6.05
2.083	0.06	2.25	1.051	I O					6.02
2.167	0.00	2.25	1.036	I O					5.99
2.250	0.00	2.24	1.021	I O					5.97
2.333	0.00	2.24	1.005	I O					5.94
2.417	0.00	2.23	0.990	I O					5.91
2.500	0.00	2.23	0.975	I O					5.88
2.583	0.00	2.22	0.959	I O					5.86
2.667	0.00	2.22	0.944	I O					5.83
2.750	0.00	2.21	0.929	I O					5.80
2.833	0.00	2.14	0.914	I O					5.48
2.917	0.00	2.10	0.899	I O					5.28
3.000	0.00	2.09	0.885	I O					5.25
3.083	0.00	2.08	0.870	I O					5.22
3.167	0.00	2.08	0.856	I O					5.19
3.250	0.00	2.07	0.842	I O					5.16
3.333	0.00	2.06	0.828	I O					5.13
3.417	0.00	2.06	0.813	I O					5.10
3.500	0.00	2.05	0.799	I O					5.07
3.583	0.00	2.04	0.785	I O					5.04
3.667	0.00	2.04	0.771	I O					5.01
3.750	0.00	2.03	0.757	I O					4.98
3.833	0.00	2.02	0.743	I O					4.96
3.917	0.00	2.02	0.729	I O					4.93
4.000	0.00	2.01	0.715	I O					4.90
4.083	0.00	2.00	0.701	I O					4.87
4.167	0.00	2.00	0.688	I O					4.84
4.250	0.00	1.99	0.674	I O					4.81
4.333	0.00	1.98	0.660	I O					4.74
4.417	0.00	1.95	0.647	IO					4.64

4.500	0.00	1.93	0.633	IO	4.54
4.583	0.00	1.91	0.620	IO	4.45
4.667	0.00	1.89	0.607	IO	4.35
4.750	0.00	1.87	0.594	IO	4.26
4.833	0.00	1.84	0.581	IO	4.16
4.917	0.00	1.82	0.569	IO	4.07
5.000	0.00	1.80	0.556	IO	3.98
5.083	0.00	1.78	0.544	IO	3.89
5.167	0.00	1.76	0.532	IO	3.81
5.250	0.00	1.74	0.520	IO	3.72
5.333	0.00	1.71	0.508	IO	3.63
5.417	0.00	1.69	0.496	IO	3.55
5.500	0.00	1.67	0.485	IO	3.46
5.583	0.00	1.64	0.473	IO	3.38
5.667	0.00	1.62	0.462	IO	3.30
5.750	0.00	1.60	0.451	IO	3.21
5.833	0.00	1.57	0.440	IO	3.14
5.917	0.00	1.55	0.429	IO	3.06
6.000	0.00	1.53	0.419	IO	2.98
6.083	0.00	1.51	0.408	IO	2.90
6.167	0.00	1.49	0.398	IO	2.83
6.250	0.00	1.46	0.388	IO	2.75
6.333	0.00	1.44	0.378	IO	2.68
6.417	0.00	1.41	0.368	IO	2.61
6.500	0.00	1.39	0.358	IO	2.54
6.583	0.00	1.37	0.349	IO	2.47
6.667	0.00	1.34	0.339	IO	2.40
6.750	0.00	1.32	0.330	IO	2.33
6.833	0.00	1.30	0.321	IO	2.27
6.917	0.00	1.28	0.312	IO	2.20
7.000	0.00	1.26	0.303	IO	2.14
7.083	0.00	1.23	0.295	IO	2.08
7.167	0.00	1.21	0.286	IO	2.02
7.250	0.00	1.19	0.278	IO	1.95
7.333	0.00	1.17	0.270	IO	1.90
7.417	0.00	1.15	0.262	IO	1.84
7.500	0.00	1.13	0.254	IO	1.78
7.583	0.00	1.11	0.246	IO	1.74
7.667	0.00	1.09	0.239	IO	1.70
7.750	0.00	1.07	0.231	IO	1.66
7.833	0.00	1.05	0.224	IO	1.62
7.917	0.00	1.03	0.217	IO	1.58
8.000	0.00	1.01	0.210	IO	1.54
8.083	0.00	0.99	0.203	IO	1.51
8.167	0.00	0.97	0.196	O	1.47
8.250	0.00	0.95	0.190	O	1.43
8.333	0.00	0.94	0.183	O	1.40
8.417	0.00	0.92	0.177	O	1.36
8.500	0.00	0.90	0.171	O	1.33
8.583	0.00	0.88	0.164	O	1.30
8.667	0.00	0.87	0.158	O	1.26
8.750	0.00	0.85	0.152	O	1.23
8.833	0.00	0.83	0.147	O	1.20
8.917	0.00	0.82	0.141	O	1.17
9.000	0.00	0.80	0.135	O	1.14
9.083	0.00	0.79	0.130	O	1.11
9.167	0.00	0.77	0.125	O	1.08
9.250	0.00	0.76	0.119	O	1.05
9.333	0.00	0.74	0.114	O	1.02
9.417	0.00	0.73	0.109	O	1.00
9.500	0.00	0.72	0.104	O	0.97
9.583	0.00	0.70	0.099	O	0.94
9.667	0.00	0.69	0.094	O	0.92

9.750	0.00	0.68	0.090	0	0.89
9.833	0.00	0.66	0.085	0	0.87
9.917	0.00	0.65	0.081	0	0.84
10.000	0.00	0.64	0.076	0	0.82
10.083	0.00	0.62	0.072	0	0.79
10.167	0.00	0.58	0.068	0	0.74
10.250	0.00	0.55	0.064	0	0.70
10.333	0.00	0.52	0.060	0	0.66
10.417	0.00	0.49	0.057	0	0.62
10.500	0.00	0.46	0.053	0	0.58
10.583	0.00	0.43	0.050	0	0.55
10.667	0.00	0.41	0.047	0	0.52
10.750	0.00	0.38	0.045	0	0.49
10.833	0.00	0.36	0.042	0	0.46
10.917	0.00	0.34	0.040	0	0.43
11.000	0.00	0.32	0.037	0	0.41
11.083	0.00	0.30	0.035	0	0.39
11.167	0.00	0.29	0.033	0	0.36
11.250	0.00	0.27	0.031	0	0.34
11.333	0.00	0.25	0.029	0	0.32
11.417	0.00	0.24	0.028	0	0.30
11.500	0.00	0.23	0.026	0	0.29
11.583	0.00	0.21	0.025	0	0.27
11.667	0.00	0.20	0.023	0	0.25
11.750	0.00	0.19	0.022	0	0.24
11.833	0.00	0.18	0.021	0	0.23
11.917	0.00	0.17	0.019	0	0.21
12.000	0.00	0.16	0.018	0	0.20
12.083	0.00	0.15	0.017	0	0.19
12.167	0.00	0.14	0.016	0	0.18
12.250	0.00	0.13	0.015	0	0.17
12.333	0.00	0.12	0.014	0	0.16
12.417	0.00	0.12	0.014	0	0.15
12.500	0.00	0.11	0.013	0	0.14
12.583	0.00	0.10	0.012	0	0.13
12.667	0.00	0.10	0.011	0	0.12
12.750	0.00	0.09	0.011	0	0.12
12.833	0.00	0.09	0.010	0	0.11
12.917	0.00	0.08	0.010	0	0.10
13.000	0.00	0.08	0.009	0	0.10
13.083	0.00	0.07	0.008	0	0.09
13.167	0.00	0.07	0.008	0	0.09
13.250	0.00	0.06	0.007	0	0.08
13.333	0.00	0.06	0.007	0	0.08
13.417	0.00	0.06	0.007	0	0.07
13.500	0.00	0.05	0.006	0	0.07
13.583	0.00	0.05	0.006	0	0.06
13.667	0.00	0.05	0.006	0	0.06
13.750	0.00	0.05	0.005	0	0.06
13.833	0.00	0.04	0.005	0	0.05
13.917	0.00	0.04	0.005	0	0.05
14.000	0.00	0.04	0.004	0	0.05
14.083	0.00	0.04	0.004	0	0.05
14.167	0.00	0.03	0.004	0	0.04
14.250	0.00	0.03	0.004	0	0.04
14.333	0.00	0.03	0.003	0	0.04
14.417	0.00	0.03	0.003	0	0.04
14.500	0.00	0.03	0.003	0	0.03
14.583	0.00	0.02	0.003	0	0.03
14.667	0.00	0.02	0.003	0	0.03
14.750	0.00	0.02	0.003	0	0.03
14.833	0.00	0.02	0.002	0	0.03
14.917	0.00	0.02	0.002	0	0.03

15.000	0.00	0.02	0.002	0				0.02
15.083	0.00	0.02	0.002	0				0.02
15.167	0.00	0.02	0.002	0				0.02
15.250	0.00	0.02	0.002	0				0.02
15.333	0.00	0.01	0.002	0				0.02
15.417	0.00	0.01	0.002	0				0.02
15.500	0.00	0.01	0.002	0				0.02
15.583	0.00	0.01	0.001	0				0.02
15.667	0.00	0.01	0.001	0				0.01
15.750	0.00	0.01	0.001	0				0.01
15.833	0.00	0.01	0.001	0				0.01
15.917	0.00	0.01	0.001	0				0.01
16.000	0.00	0.01	0.001	0				0.01
16.083	0.00	0.01	0.001	0				0.01
16.167	0.00	0.01	0.001	0				0.01
16.250	0.00	0.01	0.001	0				0.01
16.333	0.00	0.01	0.001	0				0.01
16.417	0.00	0.01	0.001	0				0.01
16.500	0.00	0.01	0.001	0				0.01
16.583	0.00	0.01	0.001	0				0.01
16.667	0.00	0.01	0.001	0				0.01
16.750	0.00	0.01	0.001	0				0.01
16.833	0.00	0.01	0.001	0				0.01
16.917	0.00	0.00	0.001	0				0.01
17.000	0.00	0.00	0.001	0				0.01
17.083	0.00	0.00	0.000	0				0.01
17.167	0.00	0.00	0.000	0				0.01
17.250	0.00	0.00	0.000	0				0.00
17.333	0.00	0.00	0.000	0				0.00
17.417	0.00	0.00	0.000	0				0.00
17.500	0.00	0.00	0.000	0				0.00
17.583	0.00	0.00	0.000	0				0.00
17.667	0.00	0.00	0.000	0				0.00
17.750	0.00	0.00	0.000	0				0.00
17.833	0.00	0.00	0.000	0				0.00
17.917	0.00	0.00	0.000	0				0.00
18.000	0.00	0.00	0.000	0				0.00
18.083	0.00	0.00	0.000	0				0.00
18.167	0.00	0.00	0.000	0				0.00
18.250	0.00	0.00	0.000	0				0.00
18.333	0.00	0.00	0.000	0				0.00
18.417	0.00	0.00	0.000	0				0.00
18.500	0.00	0.00	0.000	0				0.00
18.583	0.00	0.00	0.000	0				0.00
18.667	0.00	0.00	0.000	0				0.00
18.750	0.00	0.00	0.000	0				0.00
18.833	0.00	0.00	0.000	0				0.00
18.917	0.00	0.00	0.000	0				0.00
19.000	0.00	0.00	0.000	0				0.00
19.083	0.00	0.00	0.000	0				0.00
19.167	0.00	0.00	0.000	0				0.00

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

Number of intervals = 230

Time interval = 5.0 (Min.)

Maximum/Peak flow rate = 2.273 (CFS)

Total volume = 1.331 (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

FLOOD HYDROGRAPH ROUTING PROGRAM
 Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
 Study date: 10/14/22

 Rockefeller - Patterson Commerce Center
 Basing Routing Study - 3 Hour 100 Year Storm
 2995routing3100
 CB

Program License Serial Number 6145

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

From study/file name: 2995q100uhp3100.rte
 *****HYDROGRAPH DATA*****
 Number of intervals = 49
 Time interval = 5.0 (Min.)
 Maximum/Peak flow rate = 20.015 (CFS)
 Total volume = 1.869 (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

+++++
 Process from Point/Station 1.000 to Point/Station 1.000
 **** RETARDING BASIN ROUTING ****

 User entry of depth-outflow-storage data

 Total number of inflow hydrograph intervals = 49
 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
0.800	0.073	0.630	0.071	0.075
1.800	0.257	1.140	0.253	0.261
2.800	0.394	1.480	0.389	0.399
3.800	0.531	1.760	0.525	0.537
4.800	0.669	1.990	0.662	0.676
5.300	0.907	2.100	0.900	0.914

5.800	0.926	2.210	0.918	0.934
6.800	1.497	2.400	1.489	1.505
7.800	2.146	2.580	2.137	2.155
8.800	2.226	2.750	2.217	2.235
9.800	2.958	2.900	2.948	2.968

Hydrograph Detention Basin Routing

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

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)		.0	5.0	10.01	15.01	20.02	Depth (Ft.)
0.083	0.22	0.01	0.001	O						0.01
0.167	1.14	0.05	0.005	O I						0.06
0.250	1.84	0.13	0.015	O I						0.16
0.333	2.02	0.23	0.027	O I						0.29
0.417	2.44	0.35	0.040	O I						0.44
0.500	2.92	0.48	0.056	O I						0.61
0.583	3.34	0.63	0.074	O I						0.80
0.667	3.47	0.68	0.092	O I						0.91
0.750	3.71	0.74	0.112	O I						1.01
0.833	3.92	0.80	0.133	O I						1.13
0.917	3.75	0.85	0.154	O I						1.24
1.000	3.73	0.91	0.174	O I						1.35
1.083	4.08	0.97	0.194	O I						1.46
1.167	4.71	1.03	0.218	O I						1.59
1.250	5.13	1.10	0.244	O I						1.73
1.333	5.25	1.18	0.272	O I						1.91
1.417	5.31	1.25	0.300	O I						2.11
1.500	5.87	1.32	0.330	O I						2.33
1.583	6.41	1.40	0.363	O I						2.57
1.667	6.45	1.49	0.397	O I						2.82
1.750	6.82	1.56	0.432	O I						3.08
1.833	7.66	1.64	0.471	O I						3.36
1.917	8.03	1.72	0.513	O I						3.67
2.000	7.95	1.80	0.556	O I						3.98
2.083	8.02	1.87	0.599	O I						4.29
2.167	8.50	1.95	0.642	O I						4.61
2.250	10.01	2.00	0.692	O I						4.85
2.333	11.50	2.03	0.753	O I						4.98
2.417	11.86	2.06	0.819	O I						5.12
2.500	14.71	2.10	0.896	O I						5.28
2.583	18.16	2.23	0.994	O I						5.92
2.667	20.02	2.27	1.110	O I						6.12
2.750	18.17	2.31	1.226	O I						6.33
2.833	12.82	2.34	1.317	O I						6.48
2.917	8.98	2.36	1.376	O I						6.59
3.000	7.10	2.37	1.415	O I						6.66
3.083	4.93	2.38	1.440	O I						6.70
3.167	3.14	2.38	1.451	O I						6.72
3.250	2.21	2.39	1.453	O						6.72
3.333	1.62	2.38	1.450	O I						6.72
3.417	1.17	2.38	1.443	O I						6.71
3.500	0.88	2.38	1.434	O I						6.69
3.583	0.62	2.38	1.423	O I						6.67
3.667	0.42	2.37	1.410	O I						6.65
3.750	0.23	2.37	1.396	O I						6.62
3.833	0.10	2.36	1.381	O I						6.60
3.917	0.06	2.36	1.365	O I						6.57
4.000	0.03	2.35	1.349	O I						6.54
4.083	0.00	2.35	1.333	O I						6.51
4.167	0.00	2.34	1.317	O I						6.48

4.250	0.00	2.33	1.301	I	O	6.46
4.333	0.00	2.33	1.285	I	O	6.43
4.417	0.00	2.32	1.269	I	O	6.40
4.500	0.00	2.32	1.253	I	O	6.37
4.583	0.00	2.31	1.237	I	O	6.34
4.667	0.00	2.31	1.221	I	O	6.32
4.750	0.00	2.30	1.205	I	O	6.29
4.833	0.00	2.30	1.189	I	O	6.26
4.917	0.00	2.29	1.173	I	O	6.23
5.000	0.00	2.29	1.158	I	O	6.21
5.083	0.00	2.28	1.142	I	O	6.18
5.167	0.00	2.28	1.126	I	O	6.15
5.250	0.00	2.27	1.110	I	O	6.12
5.333	0.00	2.27	1.095	I	O	6.10
5.417	0.00	2.26	1.079	I	O	6.07
5.500	0.00	2.26	1.064	I	O	6.04
5.583	0.00	2.25	1.048	I	O	6.01
5.667	0.00	2.25	1.033	I	O	5.99
5.750	0.00	2.24	1.017	I	O	5.96
5.833	0.00	2.24	1.002	I	O	5.93
5.917	0.00	2.23	0.986	I	O	5.91
6.000	0.00	2.23	0.971	I	O	5.88
6.083	0.00	2.22	0.956	I	O	5.85
6.167	0.00	2.21	0.941	I	O	5.83
6.250	0.00	2.21	0.925	I	O	5.78
6.333	0.00	2.12	0.910	I	O	5.39
6.417	0.00	2.09	0.896	I	O	5.28
6.500	0.00	2.09	0.882	I	O	5.25
6.583	0.00	2.08	0.867	I	O	5.22
6.667	0.00	2.07	0.853	I	O	5.19
6.750	0.00	2.07	0.839	I	O	5.16
6.833	0.00	2.06	0.824	I	O	5.13
6.917	0.00	2.06	0.810	I	O	5.10
7.000	0.00	2.05	0.796	I	O	5.07
7.083	0.00	2.04	0.782	I	O	5.04
7.167	0.00	2.04	0.768	I	O	5.01
7.250	0.00	2.03	0.754	I	O	4.98
7.333	0.00	2.02	0.740	I	O	4.95
7.417	0.00	2.02	0.726	I	O	4.92
7.500	0.00	2.01	0.712	I	O	4.89
7.583	0.00	2.00	0.698	I	O	4.86
7.667	0.00	2.00	0.685	I	O	4.83
7.750	0.00	1.99	0.671	I	O	4.80
7.833	0.00	1.97	0.657	I	O	4.71
7.917	0.00	1.95	0.644	I	O	4.62
8.000	0.00	1.93	0.630	I	O	4.52
8.083	0.00	1.90	0.617	I	O	4.42
8.167	0.00	1.88	0.604	I	O	4.33
8.250	0.00	1.86	0.591	I	O	4.24
8.333	0.00	1.84	0.579	I	O	4.14
8.417	0.00	1.82	0.566	I	O	4.05
8.500	0.00	1.80	0.553	I	O	3.96
8.583	0.00	1.78	0.541	I	O	3.87
8.667	0.00	1.76	0.529	I	O	3.79
8.750	0.00	1.73	0.517	I	O	3.70
8.833	0.00	1.71	0.505	I	O	3.61
8.917	0.00	1.68	0.493	I	O	3.53
9.000	0.00	1.66	0.482	I	O	3.44
9.083	0.00	1.64	0.471	I	O	3.36
9.167	0.00	1.61	0.459	I	O	3.28
9.250	0.00	1.59	0.448	I	O	3.20
9.333	0.00	1.57	0.438	I	O	3.12
9.417	0.00	1.55	0.427	I	O	3.04

9.500	0.00	1.53	0.416	I O	2.96
9.583	0.00	1.50	0.406	I O	2.89
9.667	0.00	1.48	0.395	I O	2.81
9.750	0.00	1.46	0.385	I O	2.74
9.833	0.00	1.43	0.375	I O	2.66
9.917	0.00	1.41	0.366	I O	2.59
10.000	0.00	1.39	0.356	I O	2.52
10.083	0.00	1.36	0.347	I O	2.45
10.167	0.00	1.34	0.337	I O	2.39
10.250	0.00	1.32	0.328	I O	2.32
10.333	0.00	1.29	0.319	I O	2.25
10.417	0.00	1.27	0.310	I O	2.19
10.500	0.00	1.25	0.302	IO	2.13
10.583	0.00	1.23	0.293	IO	2.06
10.667	0.00	1.21	0.285	IO	2.00
10.750	0.00	1.19	0.276	IO	1.94
10.833	0.00	1.17	0.268	IO	1.88
10.917	0.00	1.15	0.260	IO	1.82
11.000	0.00	1.13	0.252	IO	1.78
11.083	0.00	1.11	0.245	IO	1.73
11.167	0.00	1.09	0.237	IO	1.69
11.250	0.00	1.06	0.230	IO	1.65
11.333	0.00	1.04	0.223	IO	1.61
11.417	0.00	1.02	0.215	IO	1.57
11.500	0.00	1.01	0.208	IO	1.54
11.583	0.00	0.99	0.202	IO	1.50
11.667	0.00	0.97	0.195	IO	1.46
11.750	0.00	0.95	0.188	IO	1.43
11.833	0.00	0.93	0.182	IO	1.39
11.917	0.00	0.91	0.175	IO	1.36
12.000	0.00	0.90	0.169	IO	1.32
12.083	0.00	0.88	0.163	IO	1.29
12.167	0.00	0.86	0.157	IO	1.26
12.250	0.00	0.85	0.151	IO	1.22
12.333	0.00	0.83	0.145	IO	1.19
12.417	0.00	0.81	0.140	IO	1.16
12.500	0.00	0.80	0.134	IO	1.13
12.583	0.00	0.78	0.129	IO	1.10
12.667	0.00	0.77	0.123	IO	1.07
12.750	0.00	0.76	0.118	IO	1.05
12.833	0.00	0.74	0.113	IO	1.02
12.917	0.00	0.73	0.108	IO	0.99
13.000	0.00	0.71	0.103	IO	0.96
13.083	0.00	0.70	0.098	IO	0.94
13.167	0.00	0.69	0.093	IO	0.91
13.250	0.00	0.67	0.089	IO	0.88
13.333	0.00	0.66	0.084	IO	0.86
13.417	0.00	0.65	0.080	IO	0.84
13.500	0.00	0.64	0.075	IO	0.81
13.583	0.00	0.61	0.071	O	0.78
13.667	0.00	0.58	0.067	O	0.73
13.750	0.00	0.54	0.063	O	0.69
13.833	0.00	0.51	0.059	O	0.65
13.917	0.00	0.48	0.056	O	0.61
14.000	0.00	0.45	0.053	O	0.58
14.083	0.00	0.43	0.050	O	0.54
14.167	0.00	0.40	0.047	O	0.51
14.250	0.00	0.38	0.044	O	0.48
14.333	0.00	0.36	0.041	O	0.45
14.417	0.00	0.34	0.039	O	0.43
14.500	0.00	0.32	0.037	O	0.40
14.583	0.00	0.30	0.035	O	0.38
14.667	0.00	0.28	0.033	O	0.36

14.750	0.00	0.27	0.031	0	0.34
14.833	0.00	0.25	0.029	0	0.32
14.917	0.00	0.24	0.027	0	0.30
15.000	0.00	0.22	0.026	0	0.28
15.083	0.00	0.21	0.024	0	0.27
15.167	0.00	0.20	0.023	0	0.25
15.250	0.00	0.19	0.022	0	0.24
15.333	0.00	0.18	0.020	0	0.22
15.417	0.00	0.17	0.019	0	0.21
15.500	0.00	0.16	0.018	0	0.20
15.583	0.00	0.15	0.017	0	0.19
15.667	0.00	0.14	0.016	0	0.18
15.750	0.00	0.13	0.015	0	0.17
15.833	0.00	0.12	0.014	0	0.16
15.917	0.00	0.12	0.013	0	0.15
16.000	0.00	0.11	0.013	0	0.14
16.083	0.00	0.10	0.012	0	0.13
16.167	0.00	0.10	0.011	0	0.12
16.250	0.00	0.09	0.011	0	0.12
16.333	0.00	0.09	0.010	0	0.11
16.417	0.00	0.08	0.009	0	0.10
16.500	0.00	0.08	0.009	0	0.10
16.583	0.00	0.07	0.008	0	0.09
16.667	0.00	0.07	0.008	0	0.09
16.750	0.00	0.06	0.007	0	0.08
16.833	0.00	0.06	0.007	0	0.08
16.917	0.00	0.06	0.007	0	0.07
17.000	0.00	0.05	0.006	0	0.07
17.083	0.00	0.05	0.006	0	0.06
17.167	0.00	0.05	0.005	0	0.06
17.250	0.00	0.04	0.005	0	0.06
17.333	0.00	0.04	0.005	0	0.05
17.417	0.00	0.04	0.005	0	0.05
17.500	0.00	0.04	0.004	0	0.05
17.583	0.00	0.04	0.004	0	0.04
17.667	0.00	0.03	0.004	0	0.04
17.750	0.00	0.03	0.004	0	0.04
17.833	0.00	0.03	0.003	0	0.04
17.917	0.00	0.03	0.003	0	0.04
18.000	0.00	0.03	0.003	0	0.03
18.083	0.00	0.02	0.003	0	0.03
18.167	0.00	0.02	0.003	0	0.03
18.250	0.00	0.02	0.003	0	0.03
18.333	0.00	0.02	0.002	0	0.03
18.417	0.00	0.02	0.002	0	0.02
18.500	0.00	0.02	0.002	0	0.02
18.583	0.00	0.02	0.002	0	0.02
18.667	0.00	0.02	0.002	0	0.02
18.750	0.00	0.02	0.002	0	0.02
18.833	0.00	0.01	0.002	0	0.02
18.917	0.00	0.01	0.002	0	0.02
19.000	0.00	0.01	0.001	0	0.02
19.083	0.00	0.01	0.001	0	0.02
19.167	0.00	0.01	0.001	0	0.01
19.250	0.00	0.01	0.001	0	0.01
19.333	0.00	0.01	0.001	0	0.01
19.417	0.00	0.01	0.001	0	0.01
19.500	0.00	0.01	0.001	0	0.01
19.583	0.00	0.01	0.001	0	0.01
19.667	0.00	0.01	0.001	0	0.01
19.750	0.00	0.01	0.001	0	0.01
19.833	0.00	0.01	0.001	0	0.01
19.917	0.00	0.01	0.001	0	0.01

20.000	0.00	0.01	0.001	O					0.01
20.083	0.00	0.01	0.001	O					0.01
20.167	0.00	0.01	0.001	O					0.01
20.250	0.00	0.01	0.001	O					0.01
20.333	0.00	0.00	0.001	O					0.01
20.417	0.00	0.00	0.001	O					0.01
20.500	0.00	0.00	0.001	O					0.01
20.583	0.00	0.00	0.000	O					0.01
20.667	0.00	0.00	0.000	O					0.00
20.750	0.00	0.00	0.000	O					0.00
20.833	0.00	0.00	0.000	O					0.00
20.917	0.00	0.00	0.000	O					0.00
21.000	0.00	0.00	0.000	O					0.00
21.083	0.00	0.00	0.000	O					0.00
21.167	0.00	0.00	0.000	O					0.00
21.250	0.00	0.00	0.000	O					0.00
21.333	0.00	0.00	0.000	O					0.00
21.417	0.00	0.00	0.000	O					0.00
21.500	0.00	0.00	0.000	O					0.00
21.583	0.00	0.00	0.000	O					0.00
21.667	0.00	0.00	0.000	O					0.00
21.750	0.00	0.00	0.000	O					0.00
21.833	0.00	0.00	0.000	O					0.00
21.917	0.00	0.00	0.000	O					0.00
22.000	0.00	0.00	0.000	O					0.00
22.083	0.00	0.00	0.000	O					0.00
22.167	0.00	0.00	0.000	O					0.00
22.250	0.00	0.00	0.000	O					0.00
22.333	0.00	0.00	0.000	O					0.00
22.417	0.00	0.00	0.000	O					0.00
22.500	0.00	0.00	0.000	O					0.00
22.583	0.00	0.00	0.000	O					0.00

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

Number of intervals = 271

Time interval = 5.0 (Min.)

Maximum/Peak flow rate = 2.385 (CFS)

Total volume = 1.869 (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

FLOOD HYDROGRAPH ROUTING PROGRAM
 Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
 Study date: 10/14/22

 Rockefeller - Patterson Commerce Center
 Basin Routing Study - 6 Hour 100 Year Storm
 2995routing6100
 CB

Program License Serial Number 6145

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

From study/file name: 2995q100uhp6100.rte
 *****HYDROGRAPH DATA*****
 Number of intervals = 85
 Time interval = 5.0 (Min.)
 Maximum/Peak flow rate = 17.200 (CFS)
 Total volume = 2.237 (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

+++++
 Process from Point/Station 1.000 to Point/Station 1.000
 **** RETARDING BASIN ROUTING ****

 User entry of depth-outflow-storage data

 Total number of inflow hydrograph intervals = 85
 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
0.800	0.073	0.630	0.071	0.075
1.800	0.257	1.140	0.253	0.261
2.800	0.394	1.480	0.389	0.399
3.800	0.531	1.760	0.525	0.537
4.800	0.669	1.990	0.662	0.676
5.300	0.907	2.100	0.900	0.914

5.800	0.926	2.210	0.918	0.934
6.800	1.497	2.400	1.489	1.505
7.800	2.146	2.580	2.137	2.155
8.800	2.226	2.750	2.217	2.235
9.800	2.958	2.900	2.948	2.968

Hydrograph Detention Basin Routing

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

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)	.0	4.3	8.60	12.90	17.20	Depth (Ft.)
0.083	0.06	0.00	0.000	O					0.00
0.167	0.33	0.01	0.001	O					0.02
0.250	0.66	0.04	0.005	O I					0.05
0.333	0.85	0.08	0.009	O I					0.10
0.417	0.94	0.13	0.015	O I					0.16
0.500	1.03	0.18	0.021	O I					0.23
0.583	1.21	0.23	0.027	O I					0.29
0.667	1.35	0.29	0.034	O I					0.37
0.750	1.42	0.36	0.041	O I					0.45
0.833	1.46	0.42	0.048	O I					0.53
0.917	1.49	0.48	0.055	O I					0.61
1.000	1.54	0.54	0.062	O I					0.68
1.083	1.70	0.60	0.070	O I					0.76
1.167	1.83	0.64	0.078	O I					0.82
1.250	1.88	0.67	0.086	O I					0.87
1.333	1.91	0.69	0.094	O I					0.92
1.417	1.93	0.71	0.103	O I					0.96
1.500	1.95	0.74	0.111	O I					1.01
1.583	1.96	0.76	0.119	O I					1.05
1.667	1.97	0.78	0.128	O I					1.10
1.750	1.97	0.80	0.136	O I					1.14
1.833	1.98	0.83	0.144	O I					1.18
1.917	1.98	0.85	0.152	O I					1.23
2.000	2.02	0.87	0.159	O I					1.27
2.083	2.13	0.89	0.168	O I					1.31
2.167	2.13	0.92	0.176	O I					1.36
2.250	2.20	0.94	0.185	O I					1.41
2.333	2.30	0.96	0.194	O I					1.46
2.417	2.34	0.99	0.203	O I					1.51
2.500	2.36	1.02	0.212	O I					1.56
2.583	2.37	1.04	0.221	O I					1.61
2.667	2.38	1.07	0.230	O I					1.66
2.750	2.42	1.09	0.240	O I					1.71
2.833	2.57	1.12	0.249	O I					1.76
2.917	2.69	1.15	0.259	O I					1.82
3.000	2.74	1.17	0.270	O I					1.90
3.083	2.77	1.20	0.281	O I					1.97
3.167	2.82	1.23	0.292	O I					2.05
3.250	2.97	1.25	0.303	O I					2.14
3.333	3.10	1.28	0.315	O I					2.23
3.417	3.18	1.32	0.328	O I					2.32
3.500	3.39	1.35	0.341	O I					2.42
3.583	3.69	1.39	0.356	O I					2.53
3.667	4.01	1.43	0.373	O I					2.65
3.750	4.24	1.47	0.392	O I					2.78
3.833	4.48	1.52	0.411	O I					2.93
3.917	4.69	1.56	0.432	O I					3.08
4.000	4.92	1.60	0.454	O I					3.24
4.083	5.12	1.65	0.478	O I					3.41
4.167	5.38	1.70	0.502	O I					3.59

4.250	5.73	1.76	0.529	O	I					3.78
4.333	6.10	1.80	0.557	O	I					3.99
4.417	6.49	1.86	0.588	O	I					4.21
4.500	6.85	1.91	0.621	O	I					4.45
4.583	7.12	1.97	0.656	O	I					4.70
4.667	7.42	2.00	0.692	O	I					4.85
4.750	7.78	2.02	0.731	O	I					4.93
4.833	8.14	2.04	0.772	O	I					5.02
4.917	8.40	2.06	0.814	O	I					5.11
5.000	8.69	2.08	0.859	O	I					5.20
5.083	9.19	2.10	0.906	O	I	I				5.30
5.167	10.28	2.22	0.958	O		I	I			5.86
5.250	11.76	2.24	1.019	O			I			5.96
5.333	13.15	2.26	1.089	O			I			6.09
5.417	14.48	2.29	1.169	O			I	I		6.22
5.500	16.22	2.32	1.258	O				I		6.38
5.583	17.20	2.35	1.357	O				I	I	6.56
5.667	13.23	2.38	1.446	O			I			6.71
5.750	8.22	2.40	1.503	O		I				6.81
5.833	5.43	2.41	1.534	O	I					6.86
5.917	3.87	2.41	1.549	O	I					6.88
6.000	2.97	2.42	1.556	O	I					6.89
6.083	2.28	2.42	1.558	O						6.89
6.167	1.63	2.42	1.554	IO						6.89
6.250	1.13	2.41	1.547	I O						6.88
6.333	0.81	2.41	1.537	I O						6.86
6.417	0.57	2.41	1.525	I O						6.84
6.500	0.39	2.40	1.512	I O						6.82
6.583	0.26	2.40	1.498	I O						6.80
6.667	0.10	2.40	1.483	I O						6.77
6.750	0.05	2.39	1.467	I O						6.75
6.833	0.02	2.38	1.450	I O						6.72
6.917	0.01	2.38	1.434	I O						6.69
7.000	0.01	2.37	1.418	I O						6.66
7.083	0.00	2.37	1.402	I O						6.63
7.167	0.00	2.36	1.385	I O						6.60
7.250	0.00	2.36	1.369	I O						6.58
7.333	0.00	2.35	1.353	I O						6.55
7.417	0.00	2.35	1.337	I O						6.52
7.500	0.00	2.34	1.320	I O						6.49
7.583	0.00	2.34	1.304	I O						6.46
7.667	0.00	2.33	1.288	I O						6.43
7.750	0.00	2.33	1.272	I O						6.41
7.833	0.00	2.32	1.256	I O						6.38
7.917	0.00	2.31	1.240	I O						6.35
8.000	0.00	2.31	1.224	I O						6.32
8.083	0.00	2.30	1.209	I O						6.29
8.167	0.00	2.30	1.193	I O						6.27
8.250	0.00	2.29	1.177	I O						6.24
8.333	0.00	2.29	1.161	I O						6.21
8.417	0.00	2.28	1.145	I O						6.18
8.500	0.00	2.28	1.130	I O						6.16
8.583	0.00	2.27	1.114	I O						6.13
8.667	0.00	2.27	1.098	I O						6.10
8.750	0.00	2.26	1.083	I O						6.07
8.833	0.00	2.26	1.067	I O						6.05
8.917	0.00	2.25	1.052	I O						6.02
9.000	0.00	2.25	1.036	I O						5.99
9.083	0.00	2.24	1.021	I O						5.97
9.167	0.00	2.24	1.005	I O						5.94
9.250	0.00	2.23	0.990	I O						5.91
9.333	0.00	2.23	0.975	I O						5.89
9.417	0.00	2.22	0.959	I O						5.86

9.500	0.00	2.22	0.944	I	O	5.83
9.583	0.00	2.21	0.929	I	O	5.80
9.667	0.00	2.14	0.914	I	O	5.48
9.750	0.00	2.10	0.899	I	O	5.28
9.833	0.00	2.09	0.885	I	O	5.25
9.917	0.00	2.08	0.870	I	O	5.22
10.000	0.00	2.08	0.856	I	O	5.19
10.083	0.00	2.07	0.842	I	O	5.16
10.167	0.00	2.06	0.828	I	O	5.13
10.250	0.00	2.06	0.813	I	O	5.10
10.333	0.00	2.05	0.799	I	O	5.07
10.417	0.00	2.04	0.785	I	O	5.04
10.500	0.00	2.04	0.771	I	O	5.01
10.583	0.00	2.03	0.757	I	O	4.98
10.667	0.00	2.02	0.743	I	O	4.96
10.750	0.00	2.02	0.729	I	O	4.93
10.833	0.00	2.01	0.715	I	O	4.90
10.917	0.00	2.01	0.701	I	O	4.87
11.000	0.00	2.00	0.688	I	O	4.84
11.083	0.00	1.99	0.674	I	O	4.81
11.167	0.00	1.98	0.660	I	O	4.74
11.250	0.00	1.95	0.647	I	O	4.64
11.333	0.00	1.93	0.633	I	O	4.54
11.417	0.00	1.91	0.620	I	O	4.45
11.500	0.00	1.89	0.607	I	O	4.35
11.583	0.00	1.87	0.594	I	O	4.26
11.667	0.00	1.84	0.581	I	O	4.17
11.750	0.00	1.82	0.569	I	O	4.07
11.833	0.00	1.80	0.556	I	O	3.98
11.917	0.00	1.78	0.544	I	O	3.89
12.000	0.00	1.76	0.532	I	O	3.81
12.083	0.00	1.74	0.520	I	O	3.72
12.167	0.00	1.71	0.508	I	O	3.63
12.250	0.00	1.69	0.496	I	O	3.55
12.333	0.00	1.67	0.485	I	O	3.46
12.417	0.00	1.64	0.473	I	O	3.38
12.500	0.00	1.62	0.462	I	O	3.30
12.583	0.00	1.60	0.451	I	O	3.22
12.667	0.00	1.57	0.440	I	O	3.14
12.750	0.00	1.55	0.429	I	O	3.06
12.833	0.00	1.53	0.419	I	O	2.98
12.917	0.00	1.51	0.408	I	O	2.90
13.000	0.00	1.49	0.398	I	O	2.83
13.083	0.00	1.46	0.388	I	O	2.75
13.167	0.00	1.44	0.378	I	O	2.68
13.250	0.00	1.41	0.368	I	O	2.61
13.333	0.00	1.39	0.358	I	O	2.54
13.417	0.00	1.37	0.349	I	O	2.47
13.500	0.00	1.34	0.339	I	O	2.40
13.583	0.00	1.32	0.330	I	O	2.33
13.667	0.00	1.30	0.321	I	O	2.27
13.750	0.00	1.28	0.312	I	O	2.20
13.833	0.00	1.26	0.303	I	O	2.14
13.917	0.00	1.23	0.295	I	O	2.08
14.000	0.00	1.21	0.286	I	O	2.02
14.083	0.00	1.19	0.278	I	O	1.95
14.167	0.00	1.17	0.270	I	O	1.90
14.250	0.00	1.15	0.262	I	O	1.84
14.333	0.00	1.13	0.254	I	O	1.78
14.417	0.00	1.11	0.246	I	O	1.74
14.500	0.00	1.09	0.239	I	O	1.70
14.583	0.00	1.07	0.231	IO		1.66
14.667	0.00	1.05	0.224	IO		1.62

14.750	0.00	1.03	0.217	IO	1.58
14.833	0.00	1.01	0.210	IO	1.54
14.917	0.00	0.99	0.203	IO	1.51
15.000	0.00	0.97	0.196	IO	1.47
15.083	0.00	0.95	0.190	IO	1.43
15.167	0.00	0.94	0.183	IO	1.40
15.250	0.00	0.92	0.177	IO	1.36
15.333	0.00	0.90	0.171	IO	1.33
15.417	0.00	0.88	0.164	IO	1.30
15.500	0.00	0.87	0.158	IO	1.26
15.583	0.00	0.85	0.152	IO	1.23
15.667	0.00	0.83	0.147	IO	1.20
15.750	0.00	0.82	0.141	IO	1.17
15.833	0.00	0.80	0.135	IO	1.14
15.917	0.00	0.79	0.130	IO	1.11
16.000	0.00	0.77	0.125	IO	1.08
16.083	0.00	0.76	0.119	IO	1.05
16.167	0.00	0.74	0.114	IO	1.02
16.250	0.00	0.73	0.109	IO	1.00
16.333	0.00	0.72	0.104	IO	0.97
16.417	0.00	0.70	0.099	IO	0.94
16.500	0.00	0.69	0.094	IO	0.92
16.583	0.00	0.68	0.090	IO	0.89
16.667	0.00	0.66	0.085	IO	0.87
16.750	0.00	0.65	0.081	IO	0.84
16.833	0.00	0.64	0.076	IO	0.82
16.917	0.00	0.62	0.072	IO	0.79
17.000	0.00	0.58	0.068	IO	0.74
17.083	0.00	0.55	0.064	IO	0.70
17.167	0.00	0.52	0.060	O	0.66
17.250	0.00	0.49	0.057	O	0.62
17.333	0.00	0.46	0.053	O	0.58
17.417	0.00	0.43	0.050	O	0.55
17.500	0.00	0.41	0.047	O	0.52
17.583	0.00	0.38	0.045	O	0.49
17.667	0.00	0.36	0.042	O	0.46
17.750	0.00	0.34	0.040	O	0.43
17.833	0.00	0.32	0.037	O	0.41
17.917	0.00	0.30	0.035	O	0.39
18.000	0.00	0.29	0.033	O	0.36
18.083	0.00	0.27	0.031	O	0.34
18.167	0.00	0.25	0.029	O	0.32
18.250	0.00	0.24	0.028	O	0.30
18.333	0.00	0.23	0.026	O	0.29
18.417	0.00	0.21	0.025	O	0.27
18.500	0.00	0.20	0.023	O	0.25
18.583	0.00	0.19	0.022	O	0.24
18.667	0.00	0.18	0.021	O	0.23
18.750	0.00	0.17	0.019	O	0.21
18.833	0.00	0.16	0.018	O	0.20
18.917	0.00	0.15	0.017	O	0.19
19.000	0.00	0.14	0.016	O	0.18
19.083	0.00	0.13	0.015	O	0.17
19.167	0.00	0.12	0.014	O	0.16
19.250	0.00	0.12	0.014	O	0.15
19.333	0.00	0.11	0.013	O	0.14
19.417	0.00	0.10	0.012	O	0.13
19.500	0.00	0.10	0.011	O	0.12
19.583	0.00	0.09	0.011	O	0.12
19.667	0.00	0.09	0.010	O	0.11
19.750	0.00	0.08	0.010	O	0.10
19.833	0.00	0.08	0.009	O	0.10
19.917	0.00	0.07	0.008	O	0.09

20.000	0.00	0.07	0.008	0				0.09
20.083	0.00	0.06	0.007	0				0.08
20.167	0.00	0.06	0.007	0				0.08
20.250	0.00	0.06	0.007	0				0.07
20.333	0.00	0.05	0.006	0				0.07
20.417	0.00	0.05	0.006	0				0.06
20.500	0.00	0.05	0.006	0				0.06
20.583	0.00	0.05	0.005	0				0.06
20.667	0.00	0.04	0.005	0				0.05
20.750	0.00	0.04	0.005	0				0.05
20.833	0.00	0.04	0.004	0				0.05
20.917	0.00	0.04	0.004	0				0.05
21.000	0.00	0.03	0.004	0				0.04
21.083	0.00	0.03	0.004	0				0.04
21.167	0.00	0.03	0.003	0				0.04
21.250	0.00	0.03	0.003	0				0.04
21.333	0.00	0.03	0.003	0				0.03
21.417	0.00	0.02	0.003	0				0.03
21.500	0.00	0.02	0.003	0				0.03
21.583	0.00	0.02	0.003	0				0.03
21.667	0.00	0.02	0.002	0				0.03
21.750	0.00	0.02	0.002	0				0.03
21.833	0.00	0.02	0.002	0				0.02
21.917	0.00	0.02	0.002	0				0.02
22.000	0.00	0.02	0.002	0				0.02
22.083	0.00	0.02	0.002	0				0.02
22.167	0.00	0.01	0.002	0				0.02
22.250	0.00	0.01	0.002	0				0.02
22.333	0.00	0.01	0.002	0				0.02
22.417	0.00	0.01	0.001	0				0.02
22.500	0.00	0.01	0.001	0				0.01
22.583	0.00	0.01	0.001	0				0.01
22.667	0.00	0.01	0.001	0				0.01
22.750	0.00	0.01	0.001	0				0.01
22.833	0.00	0.01	0.001	0				0.01
22.917	0.00	0.01	0.001	0				0.01
23.000	0.00	0.01	0.001	0				0.01
23.083	0.00	0.01	0.001	0				0.01
23.167	0.00	0.01	0.001	0				0.01
23.250	0.00	0.01	0.001	0				0.01
23.333	0.00	0.01	0.001	0				0.01
23.417	0.00	0.01	0.001	0				0.01
23.500	0.00	0.01	0.001	0				0.01
23.583	0.00	0.01	0.001	0				0.01
23.667	0.00	0.01	0.001	0				0.01
23.750	0.00	0.00	0.001	0				0.01
23.833	0.00	0.00	0.001	0				0.01
23.917	0.00	0.00	0.000	0				0.01
24.000	0.00	0.00	0.000	0				0.01
24.083	0.00	0.00	0.000	0				0.00
24.167	0.00	0.00	0.000	0				0.00
24.250	0.00	0.00	0.000	0				0.00
24.333	0.00	0.00	0.000	0				0.00
24.417	0.00	0.00	0.000	0				0.00
24.500	0.00	0.00	0.000	0				0.00
24.583	0.00	0.00	0.000	0				0.00
24.667	0.00	0.00	0.000	0				0.00
24.750	0.00	0.00	0.000	0				0.00
24.833	0.00	0.00	0.000	0				0.00
24.917	0.00	0.00	0.000	0				0.00
25.000	0.00	0.00	0.000	0				0.00
25.083	0.00	0.00	0.000	0				0.00
25.167	0.00	0.00	0.000	0				0.00

25.250	0.00	0.00	0.000	0					0.00
25.333	0.00	0.00	0.000	0					0.00
25.417	0.00	0.00	0.000	0					0.00
25.500	0.00	0.00	0.000	0					0.00
25.583	0.00	0.00	0.000	0					0.00
25.667	0.00	0.00	0.000	0					0.00
25.750	0.00	0.00	0.000	0					0.00
25.833	0.00	0.00	0.000	0					0.00
25.917	0.00	0.00	0.000	0					0.00
26.000	0.00	0.00	0.000	0					0.00

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

Number of intervals = 312

Time interval = 5.0 (Min.)

Maximum/Peak flow rate = 2.417 (CFS)

Total volume = 2.237 (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

FLOOD HYDROGRAPH ROUTING PROGRAM
 Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2005
 Study date: 10/14/22

 Rockefeller - Patterson Commerce Center
 Basin Routing Study - 24 Hour 100 Year Storm
 2995routing24100
 CB

Program License Serial Number 6145

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

From study/file name: 2995q100uhp24100.rte
 *****HYDROGRAPH DATA*****

Number of intervals = 301
 Time interval = 5.0 (Min.)
 Maximum/Peak flow rate = 7.264 (CFS)
 Total volume = 3.542 (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

+++++

Process from Point/Station	1.000 to Point/Station	1.000
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**** RETARDING BASIN ROUTING ****

 User entry of depth-outflow-storage data

 Total number of inflow hydrograph intervals = 301
 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
0.800	0.073	0.630	0.071	0.075
1.800	0.257	1.140	0.253	0.261
2.800	0.394	1.480	0.389	0.399
3.800	0.531	1.760	0.525	0.537
4.800	0.669	1.990	0.662	0.676
5.300	0.907	2.100	0.900	0.914

5.800	0.926	2.210	0.918	0.934
6.800	1.497	2.400	1.489	1.505
7.800	2.146	2.580	2.137	2.155
8.800	2.226	2.750	2.217	2.235
9.800	2.958	2.900	2.948	2.968

Hydrograph Detention Basin Routing

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

Time (Hours)	Inflow (CFS)	Outflow (CFS)	Storage (Ac.Ft)					Depth (Ft.)
0.083	0.03	0.00	0.000	O				0.00
0.167	0.15	0.01	0.001	O				0.01
0.250	0.24	0.02	0.002	OI				0.02
0.333	0.29	0.03	0.004	OI				0.04
0.417	0.37	0.05	0.006	OI				0.06
0.500	0.44	0.07	0.008	OI				0.09
0.583	0.47	0.09	0.011	O I				0.12
0.667	0.48	0.11	0.013	O I				0.14
0.750	0.50	0.14	0.016	O I				0.17
0.833	0.52	0.16	0.018	O I				0.20
0.917	0.59	0.18	0.021	O I				0.23
1.000	0.64	0.20	0.024	O I				0.26
1.083	0.65	0.23	0.027	OI				0.29
1.167	0.61	0.25	0.029	OI				0.32
1.250	0.57	0.27	0.032	OI				0.35
1.333	0.56	0.29	0.034	OI				0.37
1.417	0.55	0.30	0.035	OI				0.39
1.500	0.55	0.32	0.037	OI				0.40
1.583	0.54	0.33	0.038	OI				0.42
1.667	0.54	0.34	0.040	OI				0.44
1.750	0.54	0.36	0.041	OI				0.45
1.833	0.55	0.37	0.042	OI				0.47
1.917	0.61	0.38	0.044	OI				0.48
2.000	0.66	0.39	0.046	OI				0.50
2.083	0.67	0.41	0.047	OI				0.52
2.167	0.68	0.42	0.049	O I				0.54
2.250	0.69	0.44	0.051	O I				0.56
2.333	0.70	0.45	0.053	OI				0.58
2.417	0.70	0.47	0.054	OI				0.60
2.500	0.70	0.48	0.056	OI				0.61
2.583	0.72	0.50	0.057	OI				0.63
2.667	0.78	0.51	0.059	OI				0.65
2.750	0.83	0.53	0.061	OI				0.67
2.833	0.85	0.55	0.063	OI				0.69
2.917	0.86	0.56	0.065	OI				0.71
3.000	0.87	0.58	0.067	OI				0.74
3.083	0.87	0.60	0.069	OI				0.76
3.167	0.88	0.61	0.071	OI				0.78
3.250	0.88	0.63	0.073	OI				0.80
3.333	0.88	0.63	0.075	OI				0.81
3.417	0.89	0.64	0.076	OI				0.82
3.500	0.89	0.64	0.078	OI				0.83
3.583	0.89	0.65	0.080	OI				0.84
3.667	0.89	0.65	0.081	OI				0.85
3.750	0.89	0.66	0.083	OI				0.85
3.833	0.90	0.66	0.085	OI				0.86
3.917	0.96	0.67	0.086	O I				0.87
4.000	1.01	0.67	0.089	O I				0.88
4.083	1.03	0.68	0.091	O I				0.90
4.167	1.04	0.69	0.093	OI				0.91

4.250	1.05	0.69	0.096	OI				0.92
4.333	1.07	0.70	0.098	OI				0.94
4.417	1.13	0.71	0.101	OI				0.95
4.500	1.18	0.72	0.104	O I				0.97
4.583	1.20	0.72	0.107	O I				0.99
4.667	1.21	0.73	0.111	O I				1.00
4.750	1.22	0.74	0.114	O I				1.02
4.833	1.14	0.75	0.117	O I				1.04
4.917	0.75	0.76	0.118	O				1.05
5.000	0.44	0.75	0.117	I O				1.04
5.083	0.40	0.75	0.115	I O				1.03
5.167	0.66	0.74	0.113	IO				1.02
5.250	0.88	0.74	0.114	O				1.02
5.333	0.96	0.75	0.115	OI				1.03
5.417	1.06	0.75	0.117	OI				1.04
5.500	1.13	0.76	0.119	OI				1.05
5.583	1.07	0.76	0.121	OI				1.06
5.667	0.73	0.77	0.122	O				1.07
5.750	0.45	0.76	0.121	I O				1.06
5.833	0.35	0.76	0.119	I O				1.05
5.917	0.30	0.75	0.116	I O				1.03
6.000	0.27	0.74	0.112	I O				1.01
6.083	0.27	0.73	0.109	I O				1.00
6.167	0.35	0.72	0.106	I O				0.98
6.250	0.41	0.72	0.104	I O				0.97
6.333	0.43	0.71	0.102	I O				0.96
6.417	0.44	0.70	0.100	I O				0.95
6.500	0.45	0.70	0.098	I O				0.94
6.583	0.48	0.70	0.097	IO				0.93
6.667	0.57	0.69	0.096	IO				0.92
6.750	0.65	0.69	0.095	IO				0.92
6.833	0.69	0.69	0.095	O				0.92
6.917	0.72	0.69	0.095	O				0.92
7.000	0.74	0.69	0.095	O				0.92
7.083	0.75	0.69	0.096	O				0.92
7.167	0.77	0.69	0.096	O				0.92
7.250	0.78	0.70	0.097	O				0.93
7.333	0.81	0.70	0.097	O				0.93
7.417	0.91	0.70	0.098	O				0.94
7.500	0.99	0.70	0.100	OI				0.95
7.583	1.04	0.71	0.102	OI				0.96
7.667	1.15	0.72	0.105	O I				0.97
7.750	1.24	0.73	0.108	O I				0.99
7.833	1.30	0.74	0.112	O I				1.01
7.917	1.41	0.75	0.116	O I				1.03
8.000	1.50	0.76	0.121	O I				1.06
8.083	1.59	0.78	0.126	O I				1.09
8.167	1.79	0.79	0.132	O I				1.12
8.250	1.95	0.81	0.140	O I				1.16
8.333	2.02	0.84	0.148	O I				1.21
8.417	2.07	0.86	0.156	O I				1.25
8.500	2.11	0.88	0.164	O I				1.30
8.583	2.16	0.91	0.173	O I				1.34
8.667	2.26	0.93	0.182	O I				1.39
8.750	2.35	0.96	0.191	O I				1.44
8.833	2.41	0.98	0.201	O I				1.49
8.917	2.53	1.01	0.211	O I				1.55
9.000	2.62	1.04	0.222	O I				1.61
9.083	2.70	1.07	0.233	O I				1.67
9.167	2.90	1.11	0.244	O I				1.73
9.250	3.06	1.14	0.257	O I				1.80
9.333	3.15	1.17	0.271	O I				1.90
9.417	3.28	1.21	0.285	O I				2.00

9.500	3.39	1.24	0.299	O		I				2.11
9.583	3.46	1.28	0.314	O		I				2.22
9.667	3.58	1.32	0.329	O		I				2.33
9.750	3.68	1.36	0.345	O		I				2.44
9.833	3.75	1.40	0.361	O		I				2.56
9.917	3.87	1.44	0.378	O			I			2.68
10.000	3.96	1.48	0.395	O			I			2.80
10.083	3.87	1.52	0.411	O			I			2.93
10.167	3.32	1.54	0.426	O		I				3.03
10.250	2.86	1.57	0.436	O		I				3.11
10.333	2.70	1.58	0.444	O		I				3.17
10.417	2.60	1.60	0.452	O		I				3.22
10.500	2.54	1.61	0.458	O		I				3.27
10.583	2.60	1.62	0.465	O		I				3.32
10.667	2.99	1.64	0.473	O		I				3.38
10.750	3.31	1.66	0.483	O		I				3.45
10.833	3.43	1.69	0.495	O		I				3.54
10.917	3.50	1.71	0.507	O		I				3.63
11.000	3.55	1.74	0.520	O		I				3.72
11.083	3.56	1.76	0.532	O		I				3.81
11.167	3.50	1.78	0.544	O		I				3.89
11.250	3.46	1.80	0.556	O		I				3.98
11.333	3.46	1.82	0.567	O		I				4.06
11.417	3.46	1.84	0.578	O		I				4.14
11.500	3.47	1.86	0.589	O		I				4.22
11.583	3.43	1.88	0.600	O		I				4.30
11.667	3.28	1.89	0.611	O		I				4.38
11.750	3.14	1.91	0.620	O		I				4.44
11.833	3.11	1.92	0.628	O		I				4.50
11.917	3.17	1.94	0.636	O		I				4.56
12.000	3.22	1.95	0.645	O		I				4.63
12.083	3.38	1.97	0.654	O		I				4.69
12.167	3.97	1.98	0.666	O			I			4.78
12.250	4.46	2.00	0.681	O			I			4.83
12.333	4.68	2.00	0.699	O			I			4.86
12.417	4.88	2.01	0.718	O			I			4.90
12.500	5.03	2.02	0.738	O			I			4.95
12.583	5.16	2.03	0.759	O			I			4.99
12.667	5.38	2.04	0.782	O			I			5.04
12.750	5.57	2.05	0.805	O			I			5.09
12.833	5.68	2.06	0.830	O			I			5.14
12.917	5.83	2.08	0.855	O			I			5.19
13.000	5.94	2.09	0.881	O			I			5.25
13.083	6.11	2.11	0.908	O			I			5.34
13.167	6.57	2.21	0.937	O				I		5.82
13.250	6.94	2.22	0.968	O				I		5.87
13.333	7.10	2.24	1.001	O				I		5.93
13.417	7.20	2.25	1.035	O				I		5.99
13.500	7.26	2.26	1.069	O				I		6.05
13.583	7.09	2.27	1.103	O				I		6.11
13.667	6.21	2.28	1.133	O				I		6.16
13.750	5.49	2.29	1.158	O				I		6.21
13.833	5.22	2.29	1.179	O			I			6.24
13.917	5.06	2.30	1.199	O			I			6.28
14.000	4.96	2.31	1.217	O			I			6.31
14.083	4.97	2.31	1.236	O			I			6.34
14.167	5.26	2.32	1.255	O			I			6.38
14.250	5.49	2.33	1.276	O				I		6.41
14.333	5.55	2.33	1.298	O				I		6.45
14.417	5.51	2.34	1.320	O				I		6.49
14.500	5.47	2.35	1.342	O				I		6.53
14.583	5.46	2.36	1.363	O				I		6.57
14.667	5.45	2.36	1.384	O				I		6.60

14.750	5.46	2.37	1.406			O		I	6.64
14.833	5.46	2.38	1.427			O		I	6.68
14.917	5.38	2.38	1.448			O		I	6.71
15.000	5.32	2.39	1.468			O		I	6.75
15.083	5.28	2.40	1.488			O		I	6.78
15.167	5.20	2.40	1.508			O		I	6.82
15.250	5.12	2.41	1.527			O		I	6.85
15.333	5.07	2.41	1.545			O		I	6.87
15.417	4.97	2.42	1.563			O		I	6.90
15.500	4.89	2.42	1.580			O		I	6.93
15.583	4.78	2.43	1.597			O		I	6.95
15.667	4.43	2.43	1.612			O		I	6.98
15.750	4.14	2.44	1.625			O		I	7.00
15.833	4.02	2.44	1.636			O		I	7.01
15.917	3.96	2.44	1.647			O		I	7.03
16.000	3.91	2.44	1.657			O		I	7.05
16.083	3.64	2.45	1.666			O		I	7.06
16.167	2.60	2.45	1.671			O		I	7.07
16.250	1.69	2.45	1.669		I	O			7.06
16.333	1.12	2.45	1.662		I	O			7.05
16.417	0.73	2.44	1.651		I	O			7.04
16.500	0.52	2.44	1.639		I	O			7.02
16.583	0.42	2.44	1.625		I	O			7.00
16.667	0.49	2.43	1.611		I	O			6.98
16.750	0.56	2.43	1.598		I	O			6.96
16.833	0.56	2.42	1.585		I	O			6.94
16.917	0.55	2.42	1.573		I	O			6.92
17.000	0.54	2.42	1.560		I	O			6.90
17.083	0.51	2.41	1.547		I	O			6.88
17.167	0.42	2.41	1.533		I	O			6.86
17.250	0.36	2.41	1.519		I	O			6.83
17.333	0.35	2.40	1.505		I	O			6.81
17.417	0.34	2.40	1.491		I	O			6.79
17.500	0.34	2.39	1.477		I	O			6.76
17.583	0.34	2.39	1.463		I	O			6.74
17.667	0.34	2.38	1.449		I	O			6.72
17.750	0.34	2.38	1.435		I	O			6.69
17.833	0.33	2.37	1.421		I	O			6.67
17.917	0.24	2.37	1.406		I	O			6.64
18.000	0.18	2.36	1.391		I	O			6.61
18.083	0.15	2.36	1.376		I	O			6.59
18.167	0.14	2.35	1.361		I	O			6.56
18.250	0.14	2.35	1.346		I	O			6.54
18.333	0.13	2.34	1.330		I	O			6.51
18.417	0.13	2.34	1.315		I	O			6.48
18.500	0.13	2.33	1.300		I	O			6.46
18.583	0.16	2.33	1.285		I	O			6.43
18.667	0.30	2.32	1.271		I	O			6.40
18.750	0.40	2.32	1.257		I	O			6.38
18.833	0.43	2.32	1.244		I	O			6.36
18.917	0.40	2.31	1.231		I	O			6.33
19.000	0.37	2.31	1.218		I	O			6.31
19.083	0.37	2.30	1.204		I	O			6.29
19.167	0.43	2.30	1.191		I	O			6.26
19.250	0.48	2.29	1.178		I	O			6.24
19.333	0.47	2.29	1.166		I	O			6.22
19.417	0.36	2.29	1.153		I	O			6.20
19.500	0.27	2.28	1.140		I	O			6.17
19.583	0.27	2.28	1.126		I	O			6.15
19.667	0.37	2.27	1.112		I	O			6.13
19.750	0.45	2.27	1.099		I	O			6.10
19.833	0.47	2.26	1.087		I	O			6.08
19.917	0.42	2.26	1.074		I	O			6.06

20.000	0.39	2.26	1.062	I	O	6.04
20.083	0.39	2.25	1.049	I	O	6.02
20.167	0.44	2.25	1.036	I	O	5.99
20.250	0.49	2.24	1.024	I	O	5.97
20.333	0.50	2.24	1.012	I	O	5.95
20.417	0.51	2.23	1.000	I	O	5.93
20.500	0.52	2.23	0.988	I	O	5.91
20.583	0.52	2.23	0.976	I	O	5.89
20.667	0.53	2.22	0.965	I	O	5.87
20.750	0.53	2.22	0.953	I	O	5.85
20.833	0.52	2.22	0.941	I	O	5.83
20.917	0.46	2.21	0.929	I	O	5.81
21.000	0.41	2.16	0.917	I	O	5.57
21.083	0.41	2.10	0.906	I	O	5.30
21.167	0.46	2.09	0.894	I	O	5.27
21.250	0.50	2.09	0.883	I	O	5.25
21.333	0.50	2.08	0.872	I	O	5.23
21.417	0.44	2.08	0.861	I	O	5.20
21.500	0.40	2.07	0.850	I	O	5.18
21.583	0.36	2.07	0.838	I	O	5.15
21.667	0.23	2.06	0.826	I	O	5.13
21.750	0.14	2.06	0.813	I	O	5.10
21.833	0.12	2.05	0.800	I	O	5.07
21.917	0.21	2.04	0.787	I	O	5.05
22.000	0.29	2.04	0.774	I	O	5.02
22.083	0.29	2.03	0.762	I	O	5.00
22.167	0.19	2.03	0.750	I	O	4.97
22.250	0.11	2.02	0.737	I	O	4.94
22.333	0.11	2.02	0.724	I	O	4.92
22.417	0.20	2.01	0.711	I	O	4.89
22.500	0.28	2.00	0.699	I	O	4.86
22.583	0.30	2.00	0.687	I	O	4.84
22.667	0.32	1.99	0.676	I	O	4.81
22.750	0.33	1.98	0.664	I	O	4.76
22.833	0.34	1.96	0.653	I	O	4.68
22.917	0.34	1.94	0.642	I	O	4.60
23.000	0.35	1.93	0.631	I	O	4.52
23.083	0.35	1.91	0.620	I	O	4.44
23.167	0.35	1.89	0.609	I	O	4.37
23.250	0.35	1.87	0.599	I	O	4.29
23.333	0.35	1.86	0.588	I	O	4.21
23.417	0.36	1.84	0.578	I	O	4.14
23.500	0.36	1.82	0.568	I	O	4.07
23.583	0.36	1.80	0.558	I	O	3.99
23.667	0.36	1.79	0.548	I	O	3.92
23.750	0.36	1.77	0.538	I	O	3.85
23.833	0.36	1.75	0.528	I	O	3.78
23.917	0.36	1.74	0.519	I	O	3.71
24.000	0.36	1.72	0.509	I	O	3.64
24.083	0.33	1.70	0.500	I	O	3.57
24.167	0.21	1.68	0.490	I	O	3.50
24.250	0.11	1.66	0.480	I	O	3.43
24.333	0.08	1.63	0.469	I	O	3.35
24.417	0.05	1.61	0.458	I	O	3.27
24.500	0.04	1.59	0.448	I	O	3.19
24.583	0.03	1.57	0.437	I	O	3.11
24.667	0.02	1.55	0.427	I	O	3.04
24.750	0.02	1.53	0.416	I	O	2.96
24.833	0.01	1.50	0.406	I	O	2.89
24.917	0.01	1.48	0.396	I	O	2.81
25.000	0.00	1.46	0.385	I	O	2.74
25.083	0.00	1.43	0.376	I	O	2.67
25.167	0.00	1.41	0.366	I	O	2.59

25.250	0.00	1.39	0.356	I	O	2.52
25.333	0.00	1.36	0.347	I	O	2.45
25.417	0.00	1.34	0.337	I	O	2.39
25.500	0.00	1.32	0.328	I	O	2.32
25.583	0.00	1.29	0.319	I	O	2.25
25.667	0.00	1.27	0.310	I	O	2.19
25.750	0.00	1.25	0.302	I	O	2.13
25.833	0.00	1.23	0.293	I	O	2.06
25.917	0.00	1.21	0.285	I	O	2.00
26.000	0.00	1.19	0.276	I	O	1.94
26.083	0.00	1.17	0.268	I	O	1.88
26.167	0.00	1.15	0.260	I	O	1.82
26.250	0.00	1.13	0.253	I	O	1.78
26.333	0.00	1.11	0.245	I	O	1.73
26.417	0.00	1.09	0.237	I	O	1.69
26.500	0.00	1.06	0.230	I	O	1.65
26.583	0.00	1.04	0.223	I	O	1.61
26.667	0.00	1.02	0.216	I	O	1.57
26.750	0.00	1.01	0.209	I	O	1.54
26.833	0.00	0.99	0.202	I	O	1.50
26.917	0.00	0.97	0.195	I	O	1.46
27.000	0.00	0.95	0.188	I	O	1.43
27.083	0.00	0.93	0.182	I	O	1.39
27.167	0.00	0.91	0.175	I	O	1.36
27.250	0.00	0.90	0.169	I	O	1.32
27.333	0.00	0.88	0.163	I	O	1.29
27.417	0.00	0.86	0.157	I	O	1.26
27.500	0.00	0.85	0.151	I	O	1.23
27.583	0.00	0.83	0.145	I	O	1.19
27.667	0.00	0.82	0.140	I	O	1.16
27.750	0.00	0.80	0.134	I	O	1.13
27.833	0.00	0.78	0.129	I	O	1.10
27.917	0.00	0.77	0.123	I	O	1.07
28.000	0.00	0.76	0.118	I	O	1.05
28.083	0.00	0.74	0.113	I	O	1.02
28.167	0.00	0.73	0.108	I	O	0.99
28.250	0.00	0.71	0.103	I	O	0.96
28.333	0.00	0.70	0.098	I	O	0.94
28.417	0.00	0.69	0.093	I	O	0.91
28.500	0.00	0.67	0.089	I	O	0.89
28.583	0.00	0.66	0.084	I	O	0.86
28.667	0.00	0.65	0.080	I	O	0.84
28.750	0.00	0.64	0.075	I	O	0.81
28.833	0.00	0.61	0.071	I	O	0.78
28.917	0.00	0.58	0.067	I	O	0.73
29.000	0.00	0.54	0.063	I	O	0.69
29.083	0.00	0.51	0.059	I	O	0.65
29.167	0.00	0.48	0.056	I	O	0.61
29.250	0.00	0.45	0.053	I	O	0.58
29.333	0.00	0.43	0.050	IO		0.54
29.417	0.00	0.40	0.047	IO		0.51
29.500	0.00	0.38	0.044	IO		0.48
29.583	0.00	0.36	0.042	IO		0.45
29.667	0.00	0.34	0.039	IO		0.43
29.750	0.00	0.32	0.037	IO		0.40
29.833	0.00	0.30	0.035	IO		0.38
29.917	0.00	0.28	0.033	IO		0.36
30.000	0.00	0.27	0.031	IO		0.34
30.083	0.00	0.25	0.029	IO		0.32
30.167	0.00	0.24	0.027	IO		0.30
30.250	0.00	0.22	0.026	O		0.28
30.333	0.00	0.21	0.024	O		0.27
30.417	0.00	0.20	0.023	O		0.25

30.500	0.00	0.19	0.022	o					0.24
30.583	0.00	0.18	0.020	o					0.22
30.667	0.00	0.17	0.019	o					0.21
30.750	0.00	0.16	0.018	o					0.20
30.833	0.00	0.15	0.017	o					0.19
30.917	0.00	0.14	0.016	o					0.18
31.000	0.00	0.13	0.015	o					0.17
31.083	0.00	0.12	0.014	o					0.16
31.167	0.00	0.12	0.013	o					0.15
31.250	0.00	0.11	0.013	o					0.14
31.333	0.00	0.10	0.012	o					0.13
31.417	0.00	0.10	0.011	o					0.12
31.500	0.00	0.09	0.011	o					0.12
31.583	0.00	0.09	0.010	o					0.11
31.667	0.00	0.08	0.009	o					0.10
31.750	0.00	0.08	0.009	o					0.10
31.833	0.00	0.07	0.008	o					0.09
31.917	0.00	0.07	0.008	o					0.09
32.000	0.00	0.06	0.007	o					0.08
32.083	0.00	0.06	0.007	o					0.08
32.167	0.00	0.06	0.007	o					0.07
32.250	0.00	0.05	0.006	o					0.07
32.333	0.00	0.05	0.006	o					0.06
32.417	0.00	0.05	0.005	o					0.06
32.500	0.00	0.04	0.005	o					0.06
32.583	0.00	0.04	0.005	o					0.05
32.667	0.00	0.04	0.005	o					0.05
32.750	0.00	0.04	0.004	o					0.05
32.833	0.00	0.04	0.004	o					0.04
32.917	0.00	0.03	0.004	o					0.04
33.000	0.00	0.03	0.004	o					0.04
33.083	0.00	0.03	0.003	o					0.04
33.167	0.00	0.03	0.003	o					0.04
33.250	0.00	0.03	0.003	o					0.03
33.333	0.00	0.02	0.003	o					0.03
33.417	0.00	0.02	0.003	o					0.03
33.500	0.00	0.02	0.003	o					0.03
33.583	0.00	0.02	0.002	o					0.03
33.667	0.00	0.02	0.002	o					0.02
33.750	0.00	0.02	0.002	o					0.02
33.833	0.00	0.02	0.002	o					0.02
33.917	0.00	0.02	0.002	o					0.02
34.000	0.00	0.02	0.002	o					0.02
34.083	0.00	0.01	0.002	o					0.02
34.167	0.00	0.01	0.002	o					0.02
34.250	0.00	0.01	0.001	o					0.02
34.333	0.00	0.01	0.001	o					0.02
34.417	0.00	0.01	0.001	o					0.01
34.500	0.00	0.01	0.001	o					0.01
34.583	0.00	0.01	0.001	o					0.01
34.667	0.00	0.01	0.001	o					0.01
34.750	0.00	0.01	0.001	o					0.01
34.833	0.00	0.01	0.001	o					0.01
34.917	0.00	0.01	0.001	o					0.01
35.000	0.00	0.01	0.001	o					0.01
35.083	0.00	0.01	0.001	o					0.01
35.167	0.00	0.01	0.001	o					0.01
35.250	0.00	0.01	0.001	o					0.01
35.333	0.00	0.01	0.001	o					0.01
35.417	0.00	0.01	0.001	o					0.01
35.500	0.00	0.01	0.001	o					0.01
35.583	0.00	0.00	0.001	o					0.01
35.667	0.00	0.00	0.001	o					0.01

35.750	0.00	0.00	0.001	0					0.01
35.833	0.00	0.00	0.000	0					0.01
35.917	0.00	0.00	0.000	0					0.00
36.000	0.00	0.00	0.000	0					0.00
36.083	0.00	0.00	0.000	0					0.00
36.167	0.00	0.00	0.000	0					0.00
36.250	0.00	0.00	0.000	0					0.00
36.333	0.00	0.00	0.000	0					0.00
36.417	0.00	0.00	0.000	0					0.00
36.500	0.00	0.00	0.000	0					0.00
36.583	0.00	0.00	0.000	0					0.00
36.667	0.00	0.00	0.000	0					0.00
36.750	0.00	0.00	0.000	0					0.00
36.833	0.00	0.00	0.000	0					0.00
36.917	0.00	0.00	0.000	0					0.00
37.000	0.00	0.00	0.000	0					0.00
37.083	0.00	0.00	0.000	0					0.00
37.167	0.00	0.00	0.000	0					0.00
37.250	0.00	0.00	0.000	0					0.00
37.333	0.00	0.00	0.000	0					0.00
37.417	0.00	0.00	0.000	0					0.00
37.500	0.00	0.00	0.000	0					0.00
37.583	0.00	0.00	0.000	0					0.00
37.667	0.00	0.00	0.000	0					0.00
37.750	0.00	0.00	0.000	0					0.00
37.833	0.00	0.00	0.000	0					0.00

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

Number of intervals = 454

Time interval = 5.0 (Min.)

Maximum/Peak flow rate = 2.448 (CFS)

Total volume = 3.542 (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

Appendix E

Hydraulic Calculations

T1 Rockefeller - Patterson Commerce Center

0

T2 100 Year Storm Event - Line A Hydraulics

T3 2995LineA

SO	1004.8301497.020	4						1499.270				
R	1035.9801497.130	4		.013					.000	.000	0	
JX	1039.4401497.140	4	1	.013	3.700			1497.150	.0		.000	
R	1042.4401497.150	4		.013					.000	.000	0	
R	1133.5301497.430	4		.013					.000	45.000	0	
JX	1138.2001497.450	4	2	.013	3.600			1497.460	-90.0		.000	
R	1147.3301497.480	4		.013					.000	.000	0	
R	1290.1101497.980	4		.013					.000	.000	0	
R	1310.1101498.050	1		.013					.000	.000	0	
JX	1314.7801498.190	1	1	.013	14.700			1498.120	90.0		.000	
R	1546.2901499.350	3		.013					.000	.000	1	
R	1707.4801500.160	3		.013					.000	-45.000	0	
R	1742.8301500.330	3		.013					.000	-45.000	0	
SH	1742.8301500.330	3						1500.330				
CD	1	4	1	.000	2.000	.000	.000	.000	.00			
CD	2	4	1	.000	1.500	.000	.000	.000	.00			
CD	3	4	1	.000	1.000	.000	.000	.000	.00			
CD	4	4	1	.000	2.500	.000	.000	.000	.00			
Q				2.100	.0							

WATER SURFACE PROFILE LISTING

Date:10-14-2022 Time: 3:48:16

Rockefeller - Patterson Commerce Center
 100 Year Storm Event - Line A Hydraulics
 2995LineA

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1004.830	1497.020	2.250	1499.270	24.10	5.18	.42	1499.69	.00	1.67	1.50	2.500	.000	.00	1 .0
31.150	.0035					.0031	.10	2.25	.52	2.02	.013	.00	.00	PIPE
1035.980	1497.130	2.229	1499.359	24.10	5.21	.42	1499.78	.00	1.67	1.55	2.500	.000	.00	1 .0
JUNCT STR	.0029					.0027	.01	2.23	.53		.013	.00	.00	PIPE
1039.440	1497.140	2.465	1499.605	20.40	4.17	.27	1499.87	.00	1.53	.59	2.500	.000	.00	1 .0
3.000	.0033					.0022	.01	2.47	.25	1.79	.013	.00	.00	PIPE
1042.440	1497.150	2.462	1499.612	20.40	4.17	.27	1499.88	.00	1.53	.61	2.500	.000	.00	1 .0
91.090	.0031					.0022	.20	2.46	.26	1.85	.013	.00	.00	PIPE
1133.530	1497.430	2.373	1499.803	20.40	4.24	.28	1500.08	.00	1.53	1.10	2.500	.000	.00	1 .0
JUNCT STR	.0043					.0019	.01	2.37	.36		.013	.00	.00	PIPE
1138.200	1497.450	2.547	1499.997	16.80	3.42	.18	1500.18	.00	1.39	.00	2.500	.000	.00	1 .0
9.130	.0033					.0017	.02	2.55	.00	1.56	.013	.00	.00	PIPE
1147.330	1497.480	2.532	1500.012	16.80	3.42	.18	1500.19	.00	1.39	.00	2.500	.000	.00	1 .0
17.630	.0035					.0017	.03	2.53	.00	1.53	.013	.00	.00	PIPE
1164.960	1497.542	2.500	1500.042	16.80	3.42	.18	1500.22	.00	1.39	.00	2.500	.000	.00	1 .0
109.452	.0035					.0016	.17	2.50	.00	1.53	.013	.00	.00	PIPE
1274.412	1497.925	2.268	1500.193	16.80	3.59	.20	1500.39	.00	1.39	1.45	2.500	.000	.00	1 .0
15.698	.0035					.0015	.02	2.27	.35	1.53	.013	.00	.00	PIPE

T1 ROCKEFELLER - PATTERSON COMMERCE CENTER

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T2 100 YEAR STORM - LATERAL A-1 HYDRAULICS

T3 2995LATA-1

SO	1802.0001497.460	1							1500.000			
R	1910.9801498.010	1		.013						.000	.000	0
R	1930.1801498.100	1		.013						.000	45.000	0
SH	1930.1801498.100	1							1498.100			
CD	1	4	1	.000	1.500	.000	.000	.000	.00			
Q				3.600	.0							

ROCKEFELLER - PATTERSON COMMERCE CENTER
 100 YEAR STORM - LATERAL A-2 HYDRAULICS
 2995LATA-2

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*****
Station | Invert | Depth | Water | Q | Vel | Vel | Energy | Super | Critical | Flow Top | Height/ | Base Wt | | No Wth
      | Elev   | (FT)  | Elev  | (CFS) | (FPS) | Head | Grd.El. | Elev  | Depth   | Width   | Dia.-FT | or I.D. | ZL | Prs/Pip
L/Elem | Ch Slope | | | | | | | | | | | | | | |
***** | | | | | | | | | | | | | | | |
2002.000 | 1498.100 | 2.480 | 1500.580 | 14.70 | 4.68 | .34 | 1500.92 | .00 | 1.38 | .00 | 2.000 | .000 | .00 | 1 .0
      | | | | | | | | | | | | | | | |
      4.140 | .0048 | | | | | | | | | | | | | | | |
2006.140 | 1498.120 | 2.477 | 1500.597 | 14.70 | 4.68 | .34 | 1500.94 | .00 | 1.38 | .00 | 2.000 | .000 | .00 | 1 .0
      | | | | | | | | | | | | | | | |
    
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T1 ROCKEFELLER - PATTERSON COMMERCE CENTER

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T2 100 YEAR STORM - LINE B HYDRAULICS

T3 2995LineB

SO	2104.8301497.030	1						1499.270				
R	2163.8301497.320	1	.013						.000	.000	0	
R	2209.5201497.550	1	.013						.000	.000	1	
JX	2214.1901497.570	1	2	.013	2.900			1497.670	90.0		.000	
R	2553.4801499.190	1	.013						.000	-11.250	0	
JX	2558.1501499.213	1	2	.013	5.500			1499.200	90.0		.000	
R	2921.8701501.030	1	.013						.000	.000	1	
R	2931.8701501.080	1	.013						.000	-45.000	0	
R	3082.8501501.835	1	.013						.000	-45.000	0	
SH	3082.8501501.835	1						1501.835				
CD	1	4	1	.000	1.500	.000	.000	.000	.00			
CD	2	4	1	.000	1.000	.000	.000	.000	.00			
Q				2.800	.0							

WATER SURFACE PROFILE LISTING

Date:10-14-2022 Time: 3:49:46

ROCKEFELLER - PATTERSON COMMERCE CENTER

100 YEAR STORM - LINE B HYDRAULICS

2995LineB

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
2104.830	1497.030	2.240	1499.270	11.20	6.34	.62	1499.89	.00	1.28	.00	1.500	.000	.00	1 .0
59.000	.0049					.0114	.67	2.24	.00	1.50	.013	.00	.00	PIPE
2163.830	1497.320	2.621	1499.941	11.20	6.34	.62	1500.56	.00	1.28	.00	1.500	.000	.00	1 .0
45.690	.0050					.0114	.52	2.62	.00	1.50	.013	.00	.00	PIPE
2209.520	1497.550	2.941	1500.491	11.20	6.34	.62	1501.12	.00	1.28	.00	1.500	.000	.00	1 .0
JUNCT STR	.0043					.0088	.04	2.94	.00		.013	.00	.00	PIPE
2214.190	1497.570	3.525	1501.095	8.30	4.70	.34	1501.44	.00	1.12	.00	1.500	.000	.00	1 .0
339.290	.0048					.0062	2.12	3.52	.00	1.50	.013	.00	.00	PIPE
2553.480	1499.190	4.036	1503.226	8.30	4.70	.34	1503.57	.00	1.12	.00	1.500	.000	.00	1 .0
JUNCT STR	.0049					.0035	.02	4.04	.00		.013	.00	.00	PIPE
2558.150	1499.213	4.636	1503.849	2.80	1.58	.04	1503.89	.00	.64	.00	1.500	.000	.00	1 .0
363.720	.0050					.0007	.26	4.64	.00	.64	.013	.00	.00	PIPE
2921.870	1501.030	3.080	1504.110	2.80	1.58	.04	1504.15	.00	.64	.00	1.500	.000	.00	1 .0
10.000	.0050					.0007	.01	3.08	.00	.64	.013	.00	.00	PIPE
2931.870	1501.080	3.043	1504.123	2.80	1.58	.04	1504.16	.00	.64	.00	1.500	.000	.00	1 .0
150.980	.0050					.0007	.11	3.04	.00	.64	.013	.00	.00	PIPE
3082.850	1501.835	2.401	1504.236	2.80	1.58	.04	1504.27	.00	.64	.00	1.500	.000	.00	1 .0

T1 PATTERSON COMMERCE CENTER

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T2 100 YEAR STORM EVENT - OFFSITE LINE A HYDRAULICS

T3 2995-OFFSITE-LINEA

SO	1005.0101490.060	1						1493.840			
R	1330.3601491.040	1		.013					.000	.000	1
JX	1336.3601491.050	1	1	.013	22.100			1491.070	-90.0		.000
R	1558.0301491.720	2		.013					.000	.000	1
JX	1562.6901491.730	2	3	.013	2.300			1491.760	-45.0		.000
SH	1562.6901491.730	2						1491.738			
CD	1	4	1	.000	2.500	.000	.000	.000	.00		
CD	2	4	1	.000	2.000	.000	.000	.000	.00		
CD	3	4	1	.000	1.500	.000	.000	.000	.00		
Q				.001	.0						

WATER SURFACE PROFILE LISTING

Date:10-13-2022 Time: 6:23:19

PATTERSON COMMERCE CENTER

100 YEAR STORM EVENT - OFFSITE - LATERAL A-1 HYDRAULICS

2995-OFFSITE-LATA-1

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
1604.850	1491.080	3.350	1494.430	22.10	7.03	.77	1495.20	.00	1.68	.00	2.000	.000	.00	1 .0
8.550	.0059					.0095	.08	3.35	.00	2.00	.013	.00	.00	PIPE
1613.400	1491.130	3.382	1494.512	22.10	7.03	.77	1495.28	.00	1.68	.00	2.000	.000	.00	1 .0
17.710	.0073					.0095	.17	.00	.00	2.00	.013	.00	.00	PIPE
1631.110	1491.260	3.529	1494.789	22.10	7.03	.77	1495.56	.00	1.68	.00	2.000	.000	.00	1 .0
110.170	.0074					.0095	1.05	3.53	.00	2.00	.013	.00	.00	PIPE
1741.280	1492.070	3.771	1495.841	22.10	7.03	.77	1496.61	.00	1.68	.00	2.000	.000	.00	1 .0
JUNCT STR	.0064					.0084	.04	3.77	.00		.013	.00	.00	PIPE
1745.940	1492.100	4.128	1496.228	19.30	6.14	.59	1496.81	.00	1.58	.00	2.000	.000	.00	1 .0
373.860	.0087					.0073	2.72	4.13	.00	1.51	.013	.00	.00	PIPE
2119.800	1495.340	3.638	1498.978	19.30	6.14	.59	1499.56	.00	1.58	.00	2.000	.000	.00	1 .0
57.530	.0115					.0073	.42	.00	.00	1.35	.013	.00	.00	PIPE
2177.330	1496.000	3.472	1499.472	19.30	6.14	.59	1500.06	.00	1.58	.00	2.000	.000	.00	1 .0
10.280	.0117					.0073	.07	3.47	.00	1.34	.013	.00	.00	PIPE
2187.610	1496.120	3.427	1499.547	19.30	6.14	.59	1500.13	.00	1.58	.00	2.000	.000	.00	1 .0
56.950	.0114					.0073	.41	.00	.00	1.35	.013	.00	.00	PIPE
2244.560	1496.770	3.266	1500.036	19.30	6.14	.59	1500.62	.00	1.58	.00	2.000	.000	.00	1 .0
162.050	.0115					.0073	1.18	3.27	.00	1.35	.013	.00	.00	PIPE

T1 PATTERSON COMMERCE CENTER

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T2 100 YEAR STORM EVENT - OFFSITE - LATERAL A-1-1 HYDRAULICS

T3 2995-OFFSITE-LATA-1-1

SO	2602.8301493.170	2								1496.220		
R	2628.3901496.320	2		.013							.000	.000 0
SH	2628.3901496.320	2								1496.320		
CD	1	4	1	.000	1.500	.000	.000	.000	.000	.00		
CD	2	4	1	.000	1.500	.000	.000	.000	.000	.00		
Q				1.800	.0							

WATER SURFACE PROFILE LISTING

Date:10-13-2022 Time: 6:38:40

PATTERSON COMMERCE CENTER
100 YEAR STORM EVENT - OFFSITE - LATERAL A-1-1 HYDRAULICS
2995-OFFSITE-LATA-1-1

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
2602.830	1493.170	3.050	1496.220	1.80	1.02	.02	1496.24	.00	.50	.00	1.500	.000	.00	1 .0
12.607	.1232					.0003	.00	3.05	.00	.23	.013	.00	.00	PIPE
2615.437	1494.724	1.500	1496.224	1.80	1.02	.02	1496.24	.00	.50	.00	1.500	.000	.00	1 .0
1.116	.1232					.0003	.00	1.50	.00	.23	.013	.00	.00	PIPE
2616.553	1494.861	1.360	1496.221	1.80	1.07	.02	1496.24	.00	.50	.87	1.500	.000	.00	1 .0
.636	.1232					.0003	.00	1.36	.14	.23	.013	.00	.00	PIPE
2617.190	1494.940	1.280	1496.220	1.80	1.12	.02	1496.24	.00	.50	1.06	1.500	.000	.00	1 .0
.529	.1232					.0003	.00	1.28	.16	.23	.013	.00	.00	PIPE
2617.719	1495.005	1.213	1496.218	1.80	1.18	.02	1496.24	.00	.50	1.18	1.500	.000	.00	1 .0
.454	.1232					.0003	.00	1.21	.18	.23	.013	.00	.00	PIPE
2618.173	1495.061	1.155	1496.216	1.80	1.23	.02	1496.24	.00	.50	1.26	1.500	.000	.00	1 .0
.412	.1232					.0004	.00	1.16	.20	.23	.013	.00	.00	PIPE
2618.585	1495.112	1.102	1496.214	1.80	1.29	.03	1496.24	.00	.50	1.32	1.500	.000	.00	1 .0
.370	.1232					.0004	.00	1.10	.22	.23	.013	.00	.00	PIPE
2618.955	1495.157	1.054	1496.211	1.80	1.36	.03	1496.24	.00	.50	1.37	1.500	.000	.00	1 .0
.335	.1232					.0004	.00	1.05	.24	.23	.013	.00	.00	PIPE
2619.290	1495.198	1.010	1496.208	1.80	1.42	.03	1496.24	.00	.50	1.41	1.500	.000	.00	1 .0
.317	.1232					.0005	.00	1.01	.26	.23	.013	.00	.00	PIPE

WATER SURFACE PROFILE LISTING

Date:10-13-2022 Time: 6:38:40

PATTERSON COMMERCE CENTER
100 YEAR STORM EVENT - OFFSITE - LATERAL A-1-1 HYDRAULICS
2995-OFFSITE-LATA-1-1

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
2619.606	1495.237	.968	1496.206	1.80	1.49	.03	1496.24	.00	.50	1.44	1.500	.000	.00	1 .0
	.290	.1232				.0006	.00	.97	.29	.23	.013	.00	.00	PIPE
2619.896	1495.273	.929	1496.202	1.80	1.56	.04	1496.24	.00	.50	1.46	1.500	.000	.00	1 .0
	.263	.1232				.0006	.00	.93	.31	.23	.013	.00	.00	PIPE
2620.159	1495.306	.893	1496.199	1.80	1.64	.04	1496.24	.00	.50	1.47	1.500	.000	.00	1 .0
	.128	.1232				.0007	.00	.89	.33	.23	.013	.00	.00	PIPE
2620.287	1495.321	.858	1496.179	1.80	1.72	.05	1496.23	.00	.50	1.48	1.500	.000	.00	1 .0
HYDRAULIC JUMP														
2620.287	1495.321	.265	1495.586	1.80	8.54	1.13	1496.72	.00	.50	1.14	1.500	.000	.00	1 .0
	1.293	.1232				.0593	.08	.27	3.51	.23	.013	.00	.00	PIPE
2621.580	1495.481	.273	1495.754	1.80	8.15	1.03	1496.78	.00	.50	1.16	1.500	.000	.00	1 .0
	1.171	.1232				.0518	.06	.27	3.29	.23	.013	.00	.00	PIPE
2622.751	1495.625	.283	1495.908	1.80	7.77	.94	1496.85	.00	.50	1.17	1.500	.000	.00	1 .0
	.977	.1232				.0453	.04	.28	3.08	.23	.013	.00	.00	PIPE
2623.728	1495.745	.292	1496.037	1.80	7.41	.85	1496.89	.00	.50	1.19	1.500	.000	.00	1 .0
	.806	.1232				.0395	.03	.29	2.89	.23	.013	.00	.00	PIPE
2624.534	1495.845	.302	1496.147	1.80	7.06	.77	1496.92	.00	.50	1.20	1.500	.000	.00	1 .0
	.681	.1232				.0345	.02	.30	2.70	.23	.013	.00	.00	PIPE

WATER SURFACE PROFILE LISTING

PATTERSON COMMERCE CENTER
100 YEAR STORM EVENT - OFFSITE - LATERAL A-1-1 HYDRAULICS
2995-OFFSITE-LATA-1-1

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
2625.215	1495.928	.312	1496.241	1.80	6.73	.70	1496.94	.00	.50	1.22	1.500	.000	.00	1 .0
	.570	.1232				.0302	.02	.31	2.53	.23	.013	.00	.00	PIPE
2625.784	1495.999	.323	1496.322	1.80	6.42	.64	1496.96	.00	.50	1.23	1.500	.000	.00	1 .0
	.487	.1232				.0264	.01	.32	2.37	.23	.013	.00	.00	PIPE
2626.272	1496.059	.334	1496.393	1.80	6.12	.58	1496.97	.00	.50	1.25	1.500	.000	.00	1 .0
	.408	.1232				.0231	.01	.33	2.22	.23	.013	.00	.00	PIPE
2626.680	1496.109	.346	1496.455	1.80	5.84	.53	1496.98	.00	.50	1.26	1.500	.000	.00	1 .0
	.360	.1232				.0202	.01	.35	2.08	.23	.013	.00	.00	PIPE
2627.040	1496.153	.357	1496.510	1.80	5.56	.48	1496.99	.00	.50	1.28	1.500	.000	.00	1 .0
	.291	.1232				.0176	.01	.36	1.95	.23	.013	.00	.00	PIPE
2627.331	1496.189	.370	1496.559	1.80	5.31	.44	1497.00	.00	.50	1.29	1.500	.000	.00	1 .0
	.257	.1232				.0154	.00	.37	1.83	.23	.013	.00	.00	PIPE
2627.588	1496.221	.382	1496.603	1.80	5.06	.40	1497.00	.00	.50	1.31	1.500	.000	.00	1 .0
	.202	.1232				.0135	.00	.38	1.71	.23	.013	.00	.00	PIPE
2627.790	1496.246	.396	1496.642	1.80	4.82	.36	1497.00	.00	.50	1.32	1.500	.000	.00	1 .0
	.178	.1232				.0118	.00	.40	1.60	.23	.013	.00	.00	PIPE
2627.968	1496.268	.409	1496.677	1.80	4.60	.33	1497.01	.00	.50	1.34	1.500	.000	.00	1 .0
	.132	.1232				.0103	.00	.41	1.50	.23	.013	.00	.00	PIPE

T1 PATTERSON COMMERCE CENTER

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T2 100 YEAR STORM EVENT - OFFSITE - LATERAL A-1-2 HYDRAULICS

T3 2995-OFFSITE-LATA-1-2

SO 2702.8301492.250 2

1496.220

R 2728.4001492.510 2 .013

.000 .000 0

SH 2728.4001492.510 2

1492.510

CD 1 4 1 .000 1.500

.000 .000 .000 .00

CD 2 4 1 .000 1.500

.000 .000 .000 .00

Q 1.000 .0

T1 PATTERSON COMMERCE CENTER

0

T2 100 YEAR STORM EVENT - OFFSITE - LAT A-2 HYDRAULICS

T3 2995-OFFSITE-LATA-2

SO	2802.8301491.760	1							1495.800			
R	2841.7901491.950	1		.013						.000	.000	0
SH	2841.7901491.950	1							1491.950			
CD	1	4	1	.000	1.500	.000	.000	.000	.00			
Q				2.300	.0							

Appendix F

Catch Basin Sizing

GRATE INLET CATCH BASIN SIZING

		Orifice Not Used	
h=	0.5	h=	2
C=	3.3	C=	0.8
Weir Control Equation, $Q = CP h^{1.5}$		Orifice Control Equation = $CA*(2gh)^{1/2}$	
$L=Q/(C*h^{1.5})$		$L=((Q^2)/(C2*h^3*2*g))^{0.5}$	

Catch Basin	Area (ac)	Approx Flow Q	Not Used		USE ²
			Weir Length of opening P=L	Orifice Outlet Box, L	
CB#1					
CB#2					
CB#3		14.7	12.6		2 3'X2' Grate
CB#4					
CB#5		2.9	2.5		1 2'X2' Grate
CB#6		5.5	4.7		1 2'X2' Grate
CB#7		2.8	2.4		1 2'X2' Grate
CB#8					

Planter drains

1. SEE SEPARATE CB CALCS ON NEXT PAGE.
2. CATCH BASINS ARE LARGER THAN REQUIRED TO ACCOUNT FOR CLOGGING.

Catch Basin 1

>>>>SUMP TYPE BASIN INPUT INFORMATION<<<<

Curb Inlet Capacities are approximated based on the Bureau of
Public Roads nomograph plots for flowby basins and sump basins.

BASIN INFLOW(CFS) = 3.70

BASIN OPENING(FEET) = 0.33

DEPTH OF WATER(FEET) = 0.50

>>>>CALCULATED ESTIMATED SUMP BASIN WIDTH(FEET) = 4.01

=====

Catch Basin 2

>>>>SUMP TYPE BASIN INPUT INFORMATION<<<<

Curb Inlet Capacities are approximated based on the Bureau of
Public Roads nomograph plots for flowby basins and sump basins.

BASIN INFLOW(CFS) = 3.60

BASIN OPENING(FEET) = 0.33

DEPTH OF WATER(FEET) = 0.50

>>>>CALCULATED ESTIMATED SUMP BASIN WIDTH(FEET) = 3.90

=====

Catch Basin 4

>>>>SUMP TYPE BASIN INPUT INFORMATION<<<<

Curb Inlet Capacities are approximated based on the Bureau of
Public Roads nomograph plots for flowby basins and sump basins.

BASIN INFLOW(CFS) = 2.10

BASIN OPENING(FEET) = 0.33

DEPTH OF WATER(FEET) = 0.50

>>>>CALCULATED ESTIMATED SUMP BASIN WIDTH(FEET) = 2.27

=====

Catch Basin 8

>>>>SUMP TYPE BASIN INPUT INFORMATION<<<<

Curb Inlet Capacities are approximated based on the Bureau of
Public Roads nomograph plots for flowby basins and sump basins.

BASIN INFLOW(CFS) = 1.20

BASIN OPENING(FEET) = 0.33

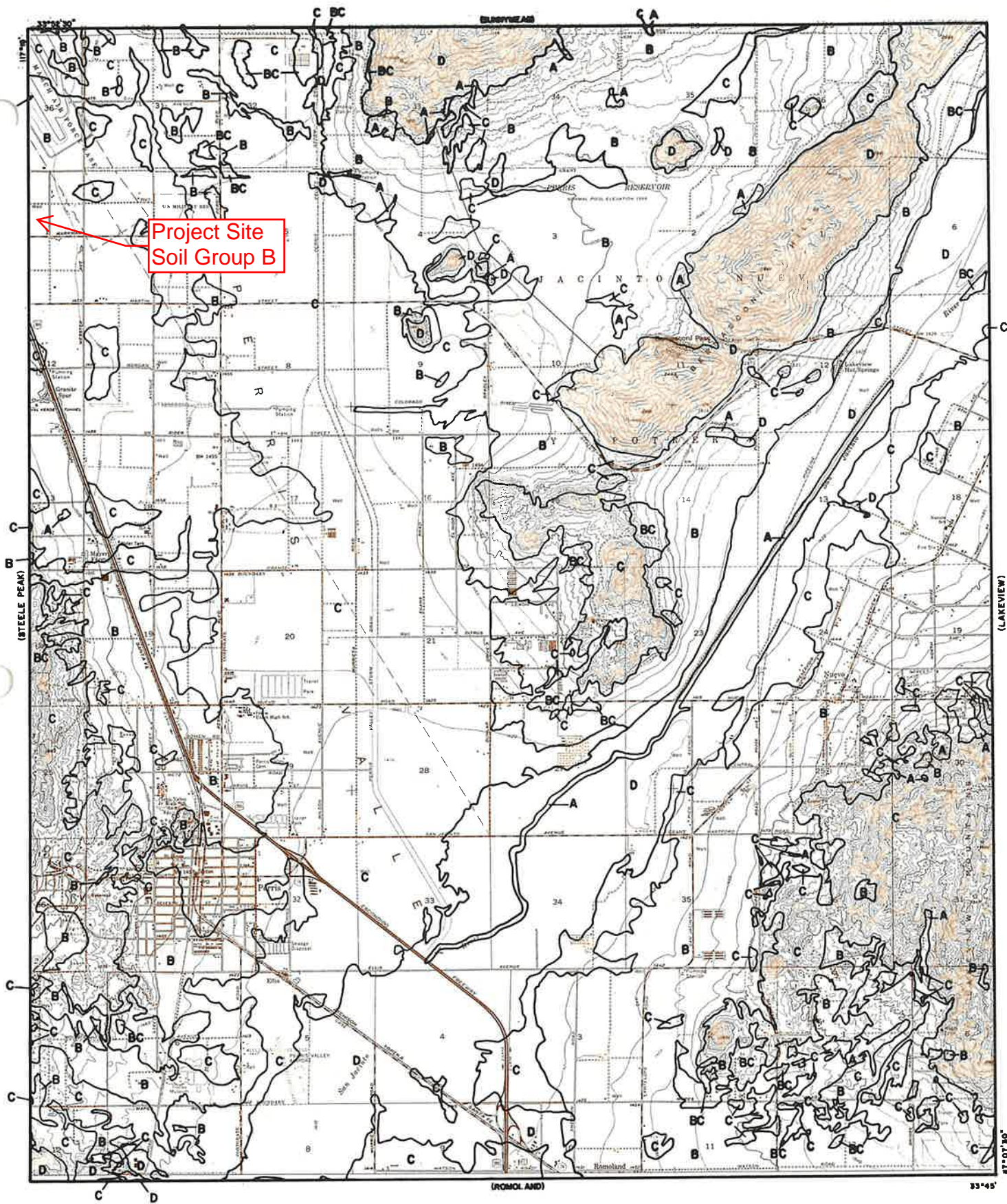
DEPTH OF WATER(FEET) = 0.50

>>>>CALCULATED ESTIMATED SUMP BASIN WIDTH(FEET) = 1.30

=====

Appendix G

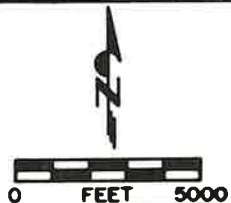
Soil Group Map and Isohyetal Map



LEGEND

- SOILS GROUP BOUNDARY
- A SOILS GROUP DESIGNATION

RCFC & WCD
HYDROLOGY MANUAL



**HYDROLOGIC SOILS GROUP MAP
FOR
PERRIS**

← Project Site
=0.47"

← Project Site
=0.79"

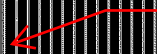
Project Site
=1.05"



← Project Site
=1.77"

← Project Site
=1.24"

Project Site
=1.9"

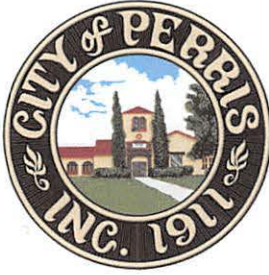


← Project Site
=2.5"

← Project Site
=4.5"

Appendix H

Lateral B-5 Analysis




CITY OF PERRIS

STUART E. MCKIBBIN, CONTRACT CITY ENGINEER

P8-1415

MEMORANDUM

TO: Lupita Garcia, Project Coordinator

FROM: Stuart E. McKibbin, Contract City Engineer 

DATE: May 13, 2022

RE: DPR 22-00003 and TPM 38384
SW Corner of Nance Street & Patterson Avenue

We have completed our 2nd review of the above-mentioned application and offer the following comments:

Street & Site Requirements:

- Applicant accepted all comments provided in 1st review.

Utilities:

- Applicant accepted all comments provided in 1st review.
- Please provide a copy of the Eastern Municipal Water District (EMWD) water and sewer will serve letter. Not located with materials provide to Engineering.

Dedications:

- Applicant accepted all comments provided in 1st review.
- If applicant is requesting formal plan check comments on Tentative Tract Map, provide the following information:
 - Current hyperlinked Title Report and Riverside County Planning Department Filing Instructions for Subdivision Application submittal requirements as shown in matrix for Tentative Tract Map (pages 2-4).

Drainage:

- A grading and drainage study plan along with Hydrology and Hydraulic (H&H) study, per City of Perris and RCFCD standards, shall be submitted for review. All intersections will be dewatered with the use of catch basins and storm drain connections shall be determined based on H&H study. The preliminary WQMP, with all

required reports, is required to determine locations of infiltration basins, other treatment facilities and drainage structures.

- All pads shall be graded to be a minimum of 1 foot above the 100-year calculated water surface of adjacent finished grade.
- No diversions will be allowed from one watershed to another. Currently, the proposed preliminary Hydrology Study only looks at mitigation, without addressing how the runoff is tabled, which is a requirement. See email discussion dated September 13, 2021. Telephone conference with Johnny Murrad on May 11, 2022, reiterated the lack of capacity in Lateral B-5 and the need to coordinate with developer to the north to take the northerly half of the runoff.

Truck Routes:

- Applicant accepted all comments provided in 1st review and noted that trucks will enter and exit off of Washington Street only (via Patterson) per the latest site plan. This is acknowledged and acceptable.

Fees:

- Applicant accepted all comments provided in 1st review.

Should you have any questions, please contact Craig Bradshaw Via e-mail at cbradshaw@interwestgrp.com.

MEMORANDUM

TO: Stuart E. McKibbin, Contract City Engineer

FROM: David White, PE

DATE: June 2, 2022

RE: DPR 22-00003

Pursuant to our zoom meeting on May 17, 2022 with the Rockefeller Group regarding drainage for the subject project at the southwest corner of Nance Street and Patterson Avenue and in response to the City's memorandum dated May 13, 2022, Huitt-Zollars, Inc. (HZ) prepared an analysis of Lateral B-5 to determine if the existing storm drain pipe could accept additional runoff from the north half of the subject project, which is currently tabled to drain north to Lateral B-6. Lateral B-5 and B-6 are both tributary to the Perris Valley Channel at Heacock and Oleander. Lateral B-6 has not been constructed.

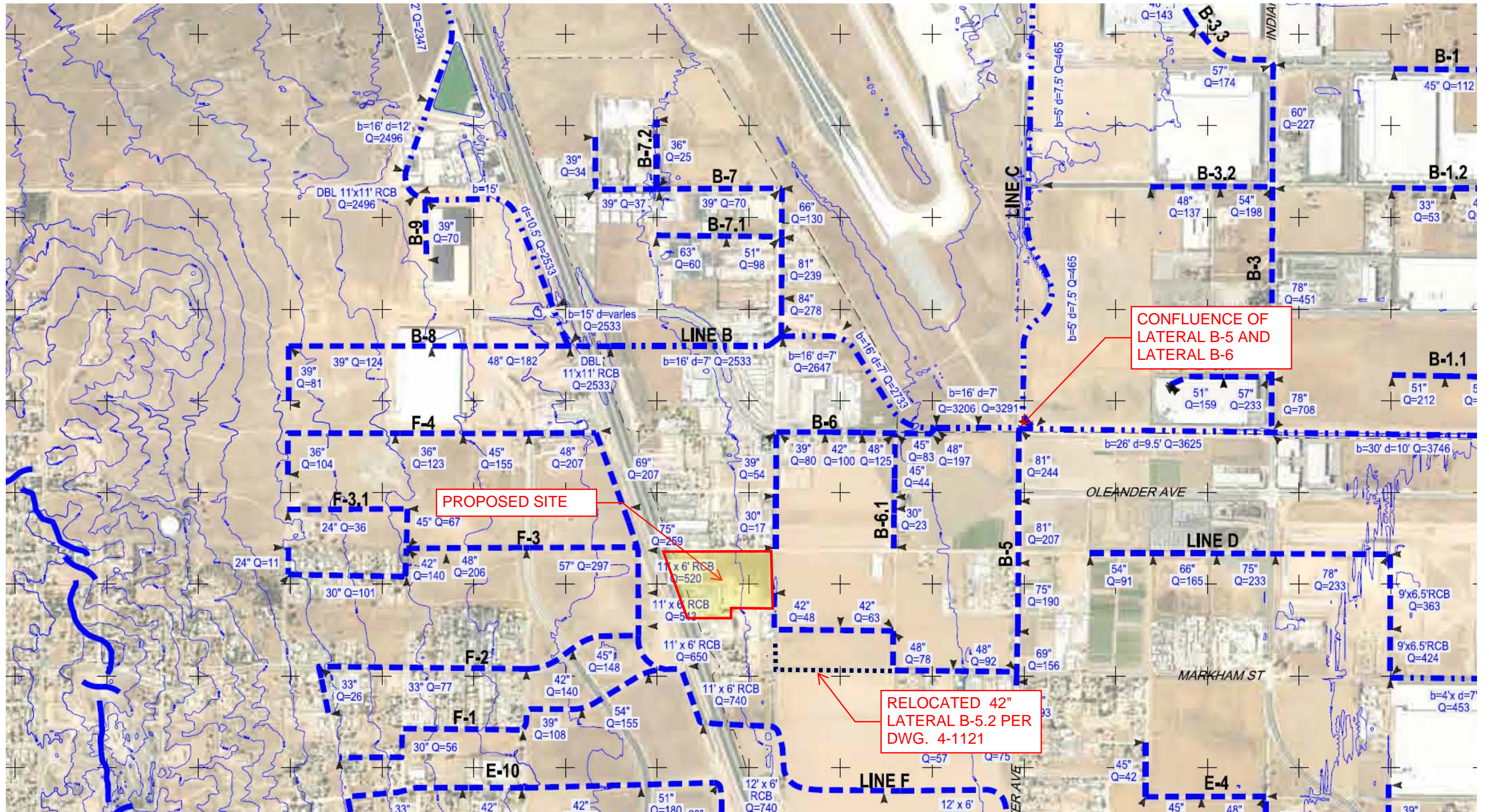
Utilizing as-built storm drain plans for Lateral B-5 HZ entered the data into WSPG software to establish a baseline 100-year hydraulic grade line (HGL) for the existing pipe. The resulting HGL compared favorably to the HGL that was plotted on the as-built plans so we concluded that the data entry was done correctly.

HZ then used the Riverside County rational method to determine the total post-development runoff (Q_{100}) from the entire subject site which resulted in an increase of 16.2 cfs near the system headworks of Lateral B-5 on Patterson Avenue. This increase was solely due to the inclusion of the northerly 7+/- acres. The drainage report prepared by Thienes Engineering for the Optimus Logistics Center II project had calculated a total Q_{100} of 57.4 cfs from the area west of Patterson Avenue and north of Markham Street. This Q includes 17.4 cfs from Interstate 215.

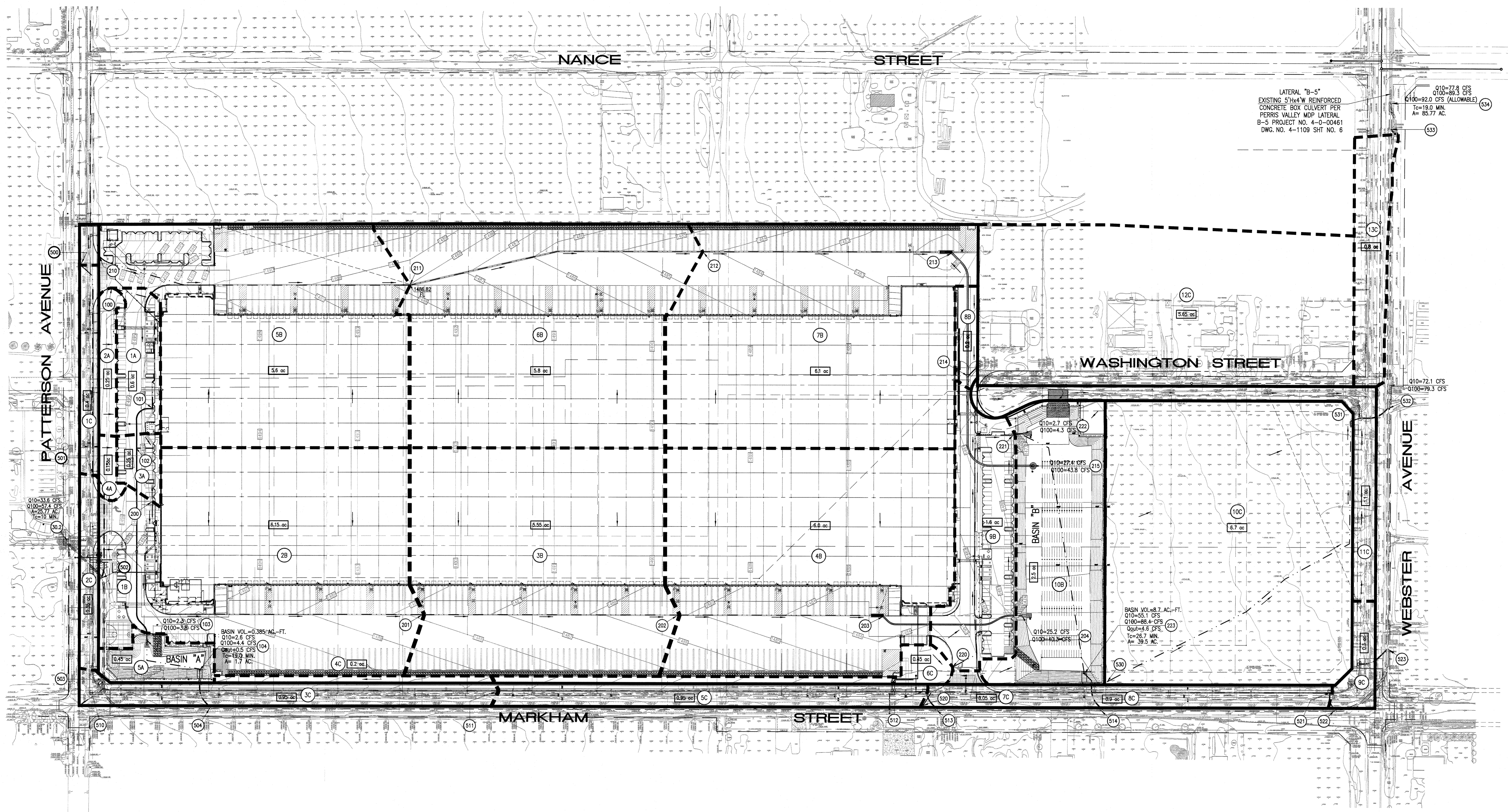
Next, HZ re-ran the WSPG introducing a proposed 36" storm drain lateral to the last leg of Lateral B-5 downstream of the terminal catch basin in Patterson Avenue. This proposed storm drain lateral extends north to Washington Avenue where another lateral will branch off and run west in Washington Avenue to pick up the public runoff from Interstate 215 and Washington Avenue. The proposed storm drain in Patterson will continue north to a point where it will receive runoff from the proposed on-site bio-retention basin.

Results from the updated WSPG reveal that the HGL rose by about 6" throughout the existing storm drain system. Except for small sections at the beginning and end of the system, the updated HGL was still below the soffit of the pipe. Even where the HGL rose above the soffit, at no point did the HGL breach the finished grade of the street. At the terminal catch basin where the HGL rose the most, it was still 3.5' below the gutter.

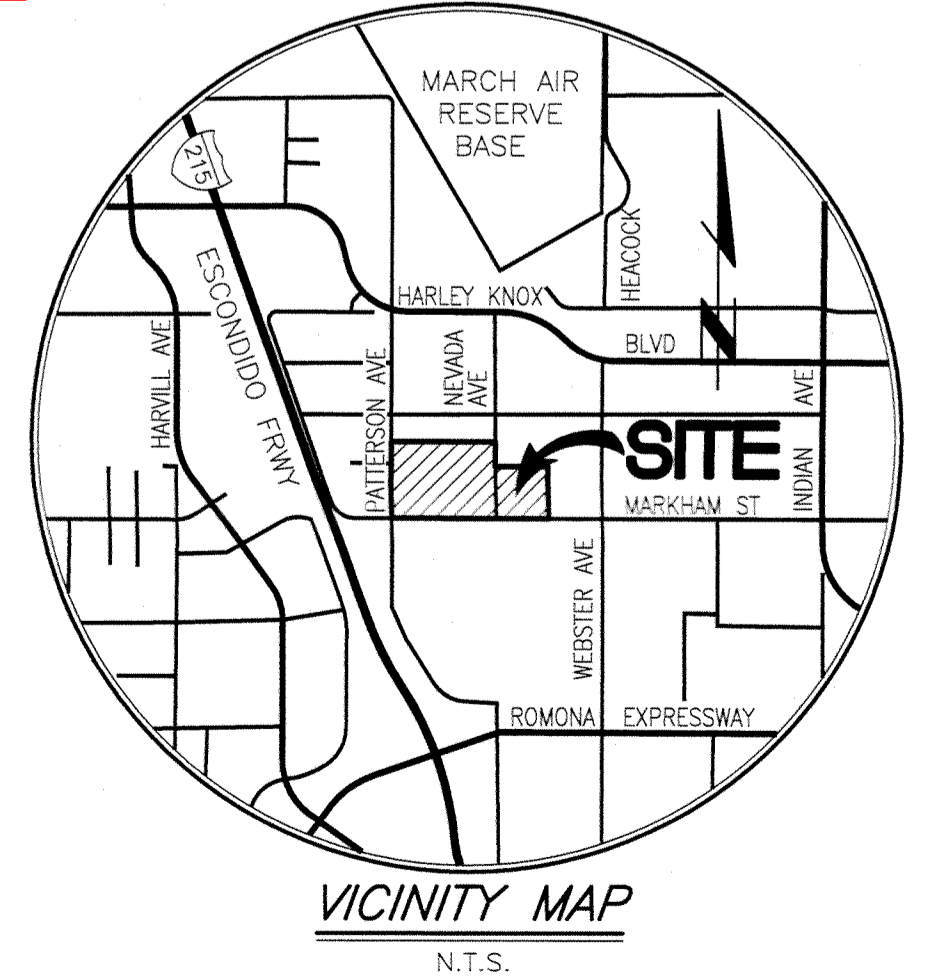
In conclusion, HZ has shown that Lateral B-5 has capacity to accept the unmitigated runoff from the portion of the subject site currently tributary to Lateral B-6. Calculations and exhibits will be added to the Preliminary Drainage Study prior to resubmittal so the City can verify the information presented in this memo.



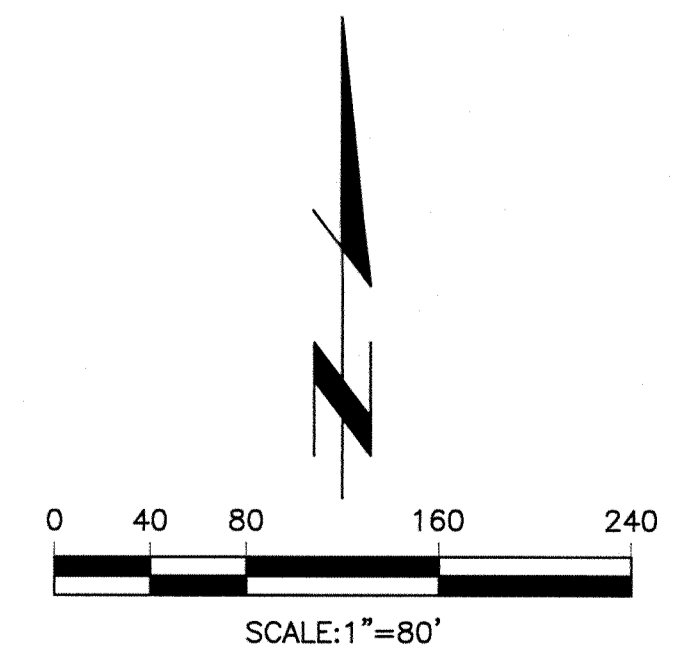
RCFC&WCD MPD



FOR REFERENCE



LEGEND	
	PROJECT BOUNDARY
	SUBAREA BOUNDARY
	FLOWLINE
	SUBAREA AREA
	NODE NUMBER



PREPARED FOR:
WESTERN REALCO
 500 NEWPORT CENTER DRIVE, SUITE 630
 NEWPORT BEACH, CA 92660
 PHONE: (949) 720-3787
 FAX: (949) 720-3790

Thienes Engineering, Inc.
 CIVIL ENGINEERING & LAND SURVEYING
 14349 FIRESTONE BOULEVARD
 LA MIRADA, CALIFORNIA 90638
 PH: (714) 261-4811 FAX: (714) 261-4173

CITY OF PERRIS PUBLIC WORKS DEPARTMENT	
PROPOSED CONDITION HYDROLOGY MAP FOR OPTIMUS LOGISTICS CENTER II MARKHAM ST.	
Designed by _____ Date _____	Approved by _____ Date _____
Checked by _____ Date _____	Public Works Director _____ R.C.E. XXXXX
Designed by _____ Date _____	
Checked by _____ Date _____	
Sheet 1 of 1 Sheets	3475 / 1 OF 1 SHEET

Last Update: 7/13/17
 0:\3400-3499\3475\3475.dwg

Lateral B-5 Analysis
 100-year proposed
 lateralb-5prop.wsw

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
2446.870	1467.370	5.000	1472.370	105.50	5.27	.43	1472.80	.00	2.79	4.00	5.000	4.000	.00	0 .0
TRANS STR	.1028					.0021	.01	5.00	.42		.014	.00	.00	BOX
2451.540	1467.850	4.530	1472.380	105.50	5.27	.43	1472.81	.00	2.40	5.00	4.000	5.000	.00	0 .0
	53.420					.0021	.11	4.53	.46	3.12	.014	.00	.00	BOX
2504.960	1467.990	4.505	1472.495	105.50	5.27	.43	1472.93	.00	2.40	5.00	4.000	5.000	.00	0 .0
JUNCT STR	.0000					.0018	.00	4.50	.46		.014	.00	.00	BOX
2504.960	1468.010	4.606	1472.616	95.50	4.77	.35	1472.97	.00	2.25	5.00	4.000	5.000	.00	0 .0
	255.040					.0018	.45	4.61	.42	2.77	.014	.00	.00	BOX
2760.000	1468.760	4.322	1473.082	95.50	4.77	.35	1473.44	.00	2.25	5.00	4.000	5.000	.00	0 .0
	264.964					.0018	.47	4.32	.42	2.76	.014	.00	.00	BOX
3024.964	1469.548	4.000	1473.548	95.50	4.77	.35	1473.90	.00	2.25	5.00	4.000	5.000	.00	0 .0
	47.776					.0011	.05	4.00	.42	2.76	.014	.00	.00	BOX
3072.740	1469.690	3.894	1473.584	95.50	4.90	.37	1473.96	.00	2.25	5.00	4.000	5.000	.00	0 .0
JUNCT STR	2.0000					.0010	.00	3.89	.44		.014	.00	.00	BOX
----- WARNING - Flow depth near top of box conduit -----														
3072.750	1469.710	3.966	1473.676	86.90	4.38	.30	1473.97	.00	2.11	5.00	4.000	5.000	.00	0 .0
	80.280					.0010	.08	3.97	.39	2.57	.014	.00	.00	BOX
----- WARNING - Flow depth near top of box conduit -----														

Lateral B-5 Analysis
100-year proposed
lateralb-5prop.wsw

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
3153.030	1469.947	3.781	1473.728	86.90	4.60	.33	1474.06	.00	2.11	5.00	4.000	5.000	.00	0 .0
79.716	.0030					.0011	.09	3.78	.42	2.57	.014	.00	.00	BOX
----- WARNING - Flow depth near top of box conduit -----														
3232.746	1470.182	3.605	1473.787	86.90	4.82	.36	1474.15	.00	2.11	5.00	4.000	5.000	.00	0 .0
79.979	.0030					.0012	.10	3.61	.45	2.57	.014	.00	.00	BOX
----- WARNING - Flow depth near top of box conduit -----														
3312.725	1470.419	3.437	1473.856	86.90	5.06	.40	1474.25	.00	2.11	5.00	4.000	5.000	.00	0 .0
74.965	.0030					.0014	.10	3.44	.48	2.57	.014	.00	.00	BOX
3387.690	1470.640	3.290	1473.930	86.90	5.28	.43	1474.36	.00	2.11	5.00	4.000	5.000	.00	0 .0
82.668	.0030					.0016	.13	3.29	.51	2.56	.014	.00	.00	BOX
3470.358	1470.886	3.137	1474.023	86.90	5.54	.48	1474.50	.00	2.11	5.00	4.000	5.000	.00	0 .0
88.520	.0030					.0018	.16	3.14	.55	2.56	.014	.00	.00	BOX
3558.879	1471.150	2.991	1474.141	86.90	5.81	.52	1474.67	.00	2.11	5.00	4.000	5.000	.00	0 .0
6.641	.0030					.0020	.01	2.99	.59	2.56	.014	.00	.00	BOX

Lateral B-5 Analysis
100-year proposed
lateralb-5prop.wsw

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
3565.520	1471.170	2.981	1474.151	86.90	5.83	.53	1474.68	.00	2.11	5.00	4.000	5.000	.00	0 .0
JUNCT STR	1.0000					.0020	.00	2.98	.59		.014	.00	.00	BOX
3565.530	1471.180	2.988	1474.168	86.30	5.78	.52	1474.69	.00	2.10	5.00	4.000	5.000	.00	0 .0
	18.940	.0026				.0020	.04	2.99	.59	2.67	.014	.00	.00	BOX
3584.470	1471.230	2.969	1474.199	86.30	5.81	.52	1474.72	.03	2.10	5.00	4.000	5.000	.00	0 .0
	70.440	.0031				.0020	.14	3.00	.59	2.51	.014	.00	.00	BOX
3654.910	1471.450	2.854	1474.304	86.30	6.05	.57	1474.87	.00	2.10	5.00	4.000	5.000	.00	0 .0
	19.460	.0026				.0022	.04	2.85	.63	2.70	.014	.00	.00	BOX
3674.370	1471.500	2.843	1474.343	86.30	6.07	.57	1474.92	.03	2.10	5.00	4.000	5.000	.00	0 .0
	34.415	.0031				.0022	.08	2.87	.63	2.51	.014	.00	.00	BOX
3708.785	1471.607	2.797	1474.404	86.30	6.17	.59	1475.00	.03	2.10	5.00	4.000	5.000	.00	0 .0
HYDRAULIC JUMP														
3708.785	1471.607	1.526	1473.133	86.30	11.31	1.99	1475.12	.11	2.10	5.00	4.000	5.000	.00	0 .0
	10.982	.0031				.0129	.14	1.64	1.61	2.51	.014	.00	.00	BOX
3719.767	1471.641	1.468	1473.109	86.30	11.76	2.15	1475.26	.12	2.10	5.00	4.000	5.000	.00	0 .0
	12.732	.0031				.0146	.19	1.59	1.71	2.51	.014	.00	.00	BOX
3732.499	1471.681	1.399	1473.080	86.30	12.33	2.36	1475.44	.13	2.10	5.00	4.000	5.000	.00	0 .0
	12.551	.0031				.0167	.21	1.53	1.84	2.51	.014	.00	.00	BOX

Lateral B-5 Analysis
100-year proposed
lateralb-5prop.wsw

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
3745.050	1471.720	1.334	1473.054	86.30	12.94	2.60	1475.65	.00	2.10	5.00	4.000	5.000	.00	0 .0
TRANS STR	.0031					.0103	.07	1.33	1.97		.013	.00	.00	BOX
3751.550	1471.740	2.815	1474.555	86.30	9.13	1.29	1475.85	.00	2.82	3.65	4.000	.000	.00	1 .0
	2.972	.0014				.0048	.01	2.82	1.00	4.00	.013	.00	.00	PIPE
3754.522	1471.744	2.943	1474.687	86.30	8.71	1.18	1475.86	.00	2.82	3.53	4.000	.000	.00	1 .0
	3.988	.0014				.0044	.02	2.94	.92	4.00	.013	.00	.00	PIPE
3758.510	1471.750	3.004	1474.754	86.30	8.52	1.13	1475.88	.00	2.82	3.46	4.000	.000	.00	1 .0
JUNCT STR	.0000					.0039	.00	3.00	.88		.013	.00	.00	PIPE
3758.510	1471.760	3.234	1474.994	84.30	7.74	.93	1475.93	.00	2.78	3.15	4.000	.000	.00	1 .0
	234.737	.0030				.0034	.79	3.23	.73	3.69	.013	.00	.00	PIPE
3993.247	1472.461	3.411	1475.872	84.30	7.38	.85	1476.72	.00	2.78	2.83	4.000	.000	.00	1 .0
	230.684	.0030				.0032	.73	3.41	.65	3.69	.013	.00	.00	PIPE
4223.930	1473.150	3.486	1476.636	84.30	7.25	.82	1477.45	.00	2.78	2.68	4.000	.000	.00	1 .0
JUNCT STR	.0000					.0029	.00	3.49	.61		.013	.00	.00	PIPE
4223.930	1473.160	3.663	1476.823	80.20	6.65	.69	1477.51	.00	2.71	2.22	4.000	.000	.00	1 .0
	334.210	.0030				.0027	.92	3.66	.50	3.36	.013	.00	.00	PIPE
4558.140	1474.160	3.549	1477.709	80.20	6.80	.72	1478.43	.00	2.71	2.53	4.000	.000	.00	1 .0
JUNCT STR	.0061					.0039	.02	3.55	.56		.013	.00	.00	PIPE

Lateral B-5 Analysis
 100-year proposed
 lateralb-5prop.wsw

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
4563.060	1474.190	3.318	1477.508	76.10	8.07	1.01	1478.52	.00	2.73	1.55	3.500	.000	.00	1 .0
59.349	.0072					.0050	.30	3.32	.58	2.58	.013	.00	.00	PIPE
4622.409	1474.616	3.090	1477.706	76.10	8.46	1.11	1478.82	.00	2.73	2.25	3.500	.000	.00	1 .0
32.542	.0072					.0053	.17	3.09	.75	2.58	.013	.00	.00	PIPE
4654.951	1474.849	2.919	1477.768	76.10	8.88	1.22	1478.99	.00	2.73	2.60	3.500	.000	.00	1 .0
5.962	.0072					.0056	.03	2.92	.86	2.58	.013	.00	.00	PIPE
4660.913	1474.892	2.885	1477.778	76.10	8.97	1.25	1479.03	.00	2.73	2.66	3.500	.000	.00	1 .0
HYDRAULIC JUMP														
4660.913	1474.892	2.579	1477.471	76.10	10.01	1.56	1479.03	.00	2.73	3.08	3.500	.000	.00	1 .0
110.614	.0072					.0072	.79	2.58	1.12	2.58	.013	.00	.00	PIPE
4771.527	1475.686	2.579	1478.265	76.10	10.01	1.56	1479.82	.00	2.73	3.08	3.500	.000	.00	1 .0
78.544	.0072					.0073	.57	2.58	1.12	2.58	.013	.00	.00	PIPE
4850.072	1476.250	2.546	1478.796	76.10	10.15	1.60	1480.39	.00	2.73	3.12	3.500	.000	.00	1 .0
76.708	.0072					.0078	.60	2.55	1.15	2.58	.013	.00	.00	PIPE
4926.780	1476.800	2.437	1479.237	76.10	10.64	1.76	1481.00	.00	2.73	3.22	3.500	.000	.00	1 .0
4.670	.0107					.0082	.04	2.44	1.26	2.22	.013	.00	.00	PIPE
4931.450	1476.850	2.458	1479.308	76.10	10.54	1.73	1481.03	.00	2.73	3.20	3.500	.000	.00	1 .0
253.072	.0081					.0081	2.05	2.46	1.24	2.46	.013	.00	.00	PIPE

Lateral B-5 Analysis
100-year proposed
lateralb-5prop.wsw

Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
5184.522	1478.899	2.458	1481.356	76.10	10.54	1.73	1483.08	.00	2.73	3.20	3.500	.000	.00	1 .0
111.357	.0081					.0078	.87	2.46	1.24	2.46	.013	.00	.00	PIPE
5295.880	1479.800	2.533	1482.333	76.10	10.21	1.62	1483.95	.00	2.73	3.13	3.500	.000	.00	1 .0
4.660	.0107					.0073	.03	2.53	1.17	2.22	.013	.00	.00	PIPE
5300.540	1479.850	2.585	1482.435	76.10	9.99	1.55	1483.98	.00	2.73	3.08	3.500	.000	.00	1 .0
270.915	.0071					.0071	1.93	2.59	1.12	2.59	.013	.00	.00	PIPE
5571.455	1481.783	2.585	1484.368	76.10	9.99	1.55	1485.92	.00	2.73	3.08	3.500	.000	.00	1 .0
93.525	.0071					.0074	.70	2.59	1.12	2.59	.013	.00	.00	PIPE
5664.980	1482.450	2.502	1484.952	76.10	10.34	1.66	1486.61	.00	2.73	3.16	3.500	.000	.00	1 .0
4.660	.0107					.0076	.04	2.50	1.19	2.22	.013	.00	.00	PIPE
5669.640	1482.500	2.539	1485.039	76.10	10.18	1.61	1486.65	.00	2.73	3.12	3.500	.000	.00	1 .0
268.800	.0075					.0075	2.00	2.54	1.16	2.54	.013	.00	.00	PIPE
5938.440	1484.503	2.539	1487.042	76.10	10.18	1.61	1488.65	.00	2.73	3.12	3.500	.000	.00	1 .0
83.694	.0075					.0072	.61	2.54	1.16	2.54	.013	.00	.00	PIPE
6022.134	1485.126	2.602	1487.728	76.10	9.92	1.53	1489.26	.00	2.73	3.06	3.500	.000	.00	1 .0
16.606	.0075					.0067	.11	2.60	1.10	2.54	.013	.00	.00	PIPE
6038.740	1485.250	2.729	1487.979	76.10	9.45	1.39	1489.37	.00	2.73	2.90	3.500	.000	.00	1 .0
JUNCT STR	.0085					.0059	.03	2.73	1.00		.013	.00	.00	PIPE

Lateral B-5 Analysis
100-year proposed
lateralb-5prop.wsw

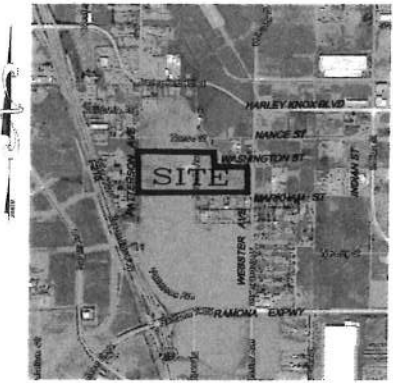
Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
6044.610	1485.300	2.887	1488.187	75.60	8.91	1.23	1489.42	.00	2.72	2.66	3.500	.000	.00	1 .0
40.357	.0040					.0054	.22	2.89	.88	3.50	.013	.00	.00	PIPE
6084.967	1485.463	3.052	1488.515	75.60	8.49	1.12	1489.63	.00	2.72	2.34	3.500	.000	.00	1 .0
111.825	.0040					.0050	.56	3.05	.77	3.50	.013	.00	.00	PIPE
6196.792	1485.915	3.262	1489.177	75.60	8.10	1.02	1490.19	.00	2.72	1.76	3.500	.000	.00	1 .0
16.088	.0040					.0049	.08	3.26	.62	3.50	.013	.00	.00	PIPE
6212.880	1485.980	3.284	1489.264	75.60	8.06	1.01	1490.27	.04	2.72	1.69	3.500	.000	.00	1 .0
70.770	.0040					.0049	.35	3.32	.60	3.50	.013	.00	.00	PIPE
6283.650	1486.260	3.382	1489.642	75.60	7.94	.98	1490.62	.00	2.72	1.26	3.500	.000	.00	1 .0
10.610	.0038					.0050	.05	3.38	.51	3.50	.013	.00	.00	PIPE
6294.260	1486.300	3.399	1489.699	75.60	7.92	.97	1490.67	.00	2.72	1.17	3.500	.000	.00	1 .0
JUNCT STR	.0642					.0051	.02	3.40	.49		.013	.00	.00	PIPE
6298.930	1486.600	2.993	1489.593	74.70	8.53	1.13	1490.72	.00	2.71	2.46	3.500	.000	.00	1 .0
44.235	.0030					.0050	.22	2.99	.80	3.50	.013	.00	.00	PIPE
6343.166	1486.733	3.183	1489.916	74.70	8.13	1.03	1490.94	.00	2.71	2.01	3.500	.000	.00	1 .0
111.212	.0030					.0050	.56	3.18	.67	3.50	.013	.00	.00	PIPE
6454.378	1487.067	3.500	1490.567	74.70	7.76	.94	1491.50	.00	2.71	.00	3.500	.000	.00	1 .0
27.762	.0030					.0054	.15	3.50	.00	3.50	.013	.00	.00	PIPE

Lateral B-5 Analysis
100-year proposed
lateralb-5prop.wsw

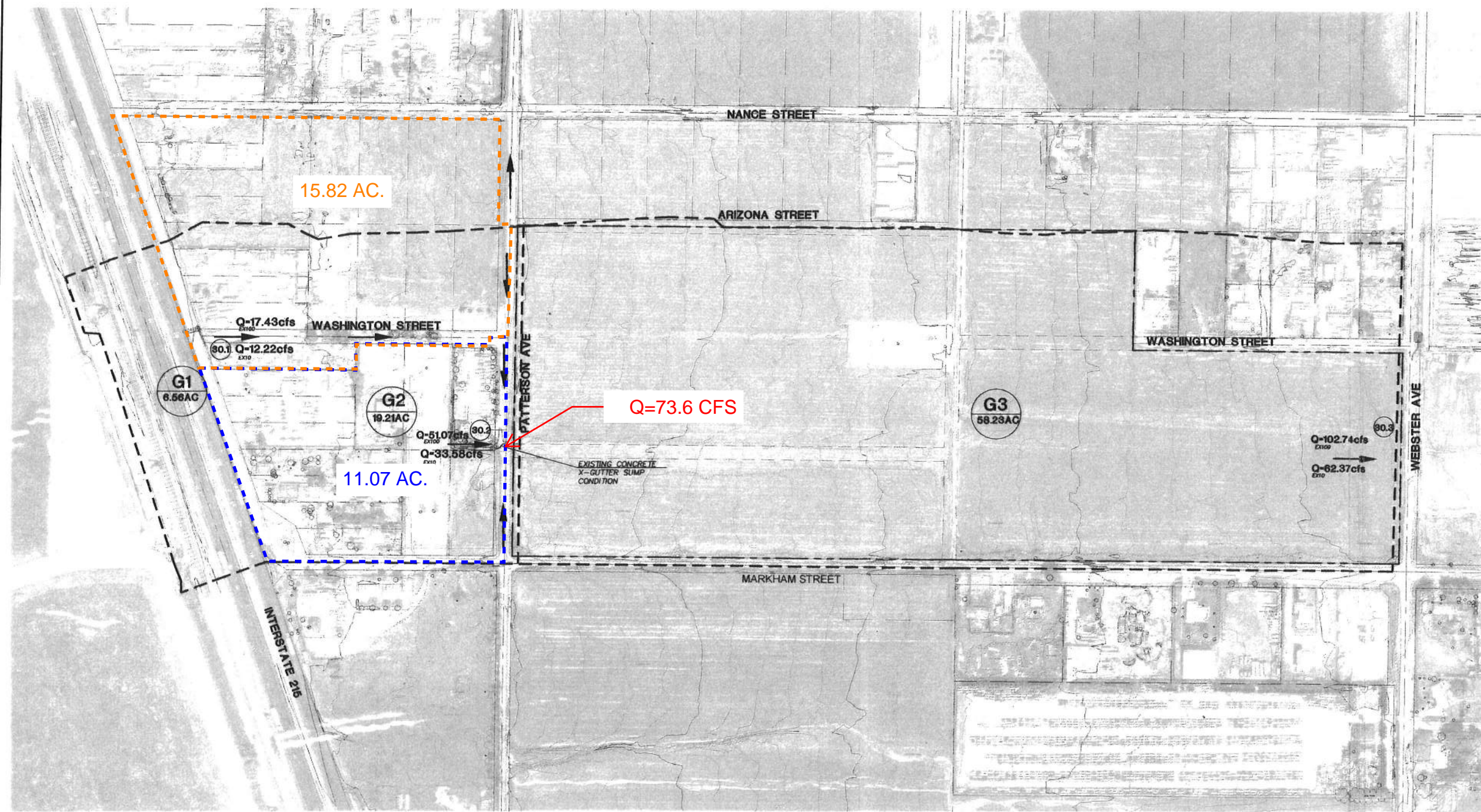
Station	Invert Elev	Depth (FT)	Water Elev	Q (CFS)	Vel (FPS)	Vel Head	Energy Grd.El.	Super Elev	Critical Depth	Flow Top Width	Height/Dia.-FT	Base Wt or I.D.	ZL	No Wth Prs/Pip
L/Elem	Ch Slope					SF Ave	HF	SE Dpth	Froude N	Norm Dp	"N"	X-Fall	ZR	Type Ch
6482.140	1487.150	3.570	1490.720	74.70	7.76	.94	1491.66	.00	2.71	.00	3.500	.000	.00	1 .0
22.870	.0031					.0055	.13	.00	.00	3.50	.013	.00	.00	PIPE
6505.010	1487.220	3.732	1490.952	74.70	7.76	.94	1491.89	.00	2.71	.00	3.500	.000	.00	1 .0
JUNCT STR	.9762					.0054	.00	.00	.00		.013	.00	.00	PIPE
6505.020	1487.230	3.776	1491.005	73.60	7.65	.91	1491.91	.00	2.69	.00	3.500	.000	.00	1 .0
12.460	.0024					.0054	.07	.00	.00	3.50	.013	.00	.00	PIPE
6517.480	1487.260	3.889	1491.149	73.60	7.65	.91	1492.06	.00	2.69	.00	3.500	.000	.00	1 .0
TRANS STR	.0021					.0088	.04	3.89	.00		.013	.00	.00	PIPE
6522.150	1487.270	3.300	1490.570	73.60	10.41	1.68	1492.25	.00	2.70	.00	3.000	.000	.00	1 .0
45.400	.0033					.0122	.55	3.30	.00	3.00	.013	.00	.00	PIPE
6567.550	1487.420	3.702	1491.123	73.60	10.41	1.68	1492.81	.00	2.70	.00	3.000	.000	.00	1 .0
JUNCT STR	.0000					.0066	.03	3.70	.00		.013	.00	.00	PIPE
6571.550	1487.420	5.608	1493.028	21.10	2.99	.14	1493.17	.00	1.48	.00	3.000	.000	.00	1 .0
27.900	.0029					.0010	.03	5.61	.00	1.66	.013	.00	.00	PIPE
6599.450	1487.500	5.556	1493.056	21.10	2.99	.14	1493.19	.00	1.48	.00	3.000	.000	.00	1 .0

OPTIMUS LOGISTICS CENTER 2

PRE-DEVELOPMENT HYDROLOGY MAP



VICINITY MAP
NOT TO SCALE



- LEGEND**
- DRAINAGE BOUNDARY
 - FLOW DIRECTION
 - Q-XX.XXcfs EXISTING 10 YEAR STORM RUNOFF
 - Q-XX.XXcfs EXISTING 100 YEAR STORM RUNOFF
 - X AREA DESIGNATION
 - X.XXAC DRAINAGE ACREAGE AREA
- ELEVATION PER NAVD88 DATUM

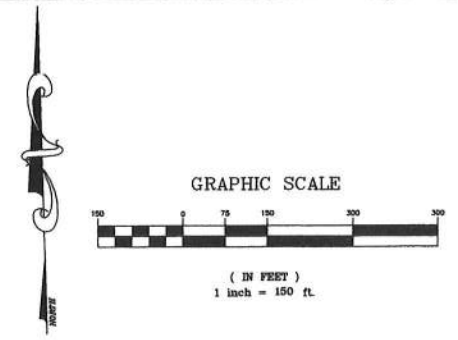
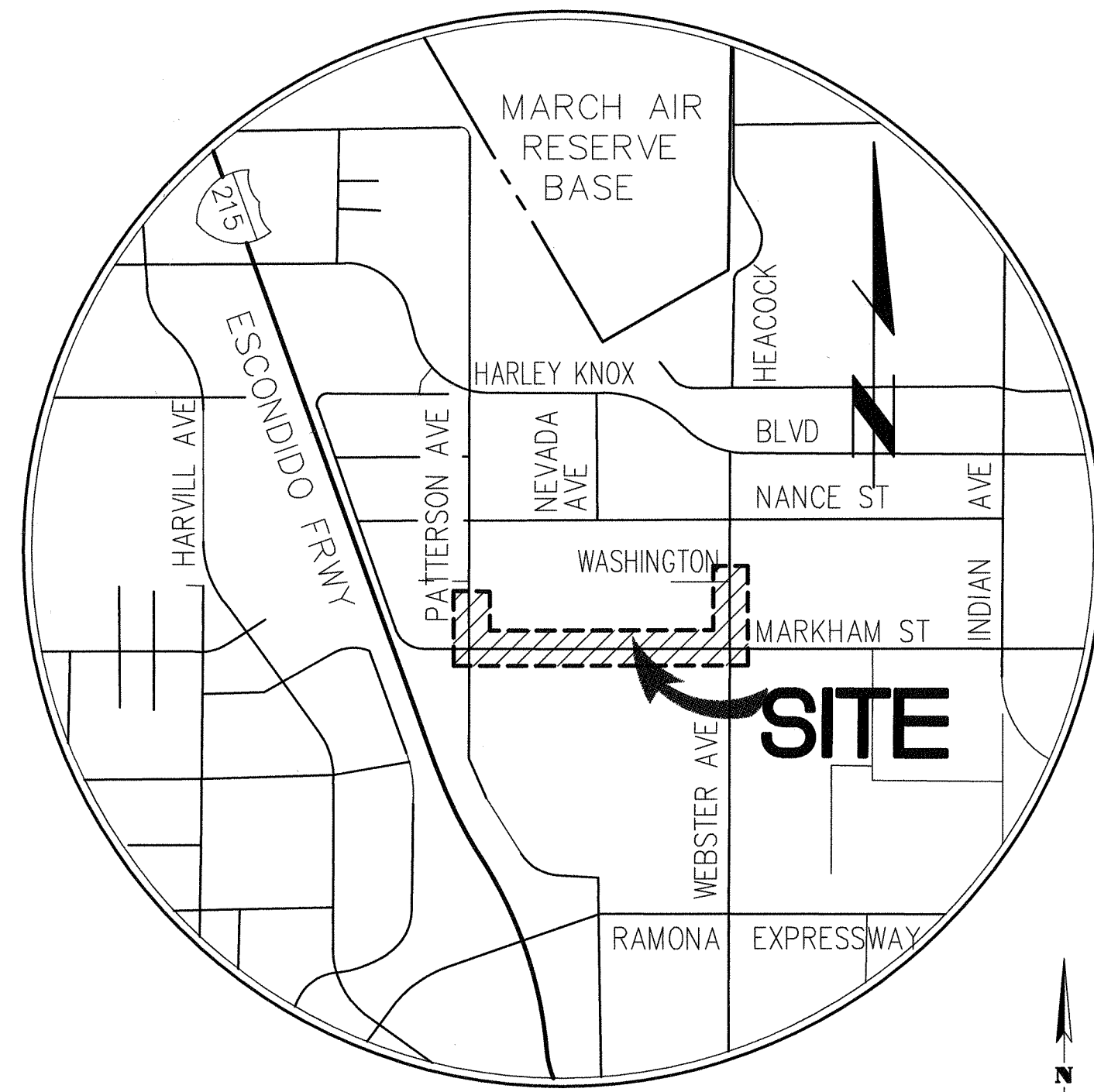
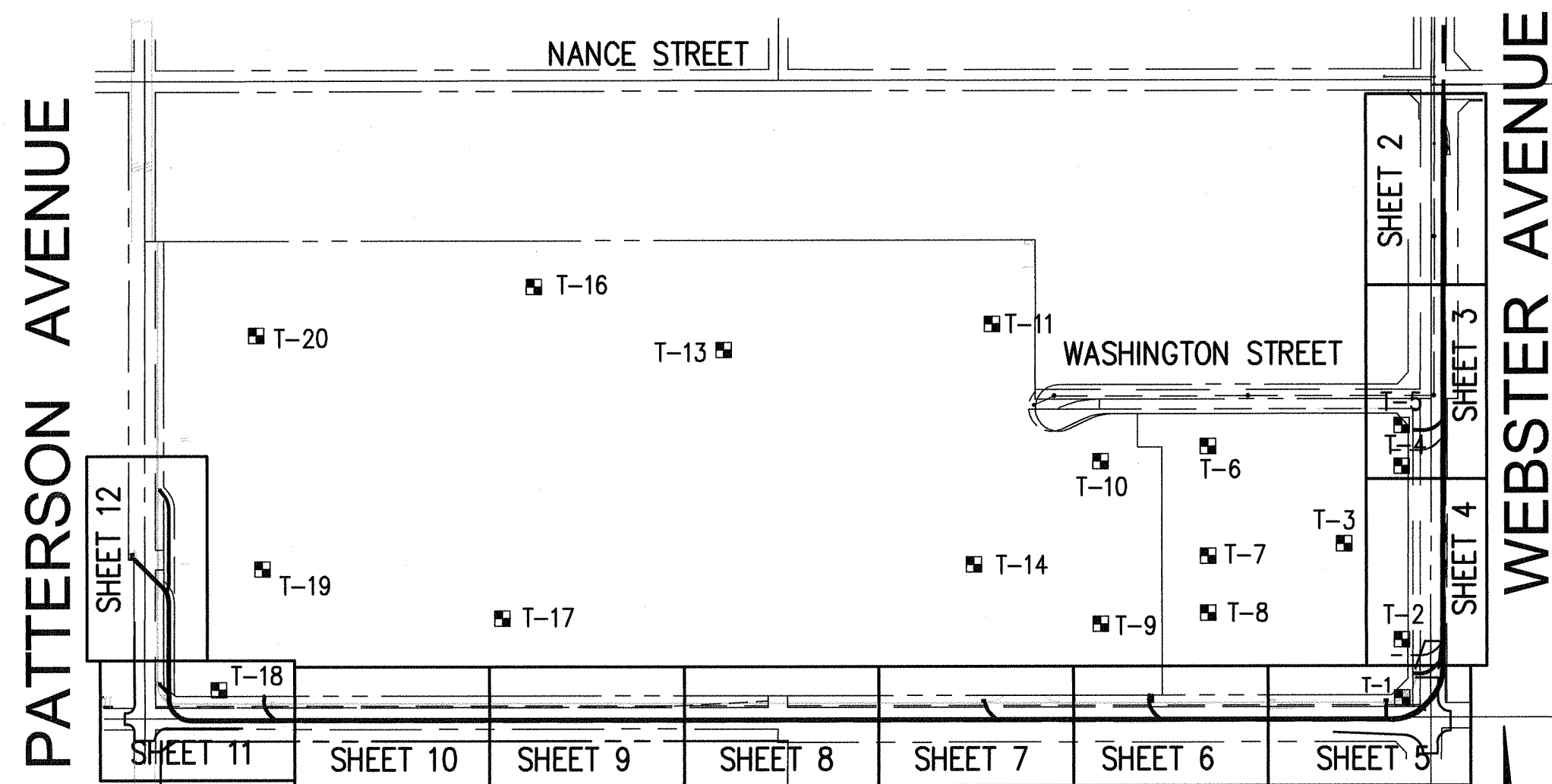


EXHIBIT A
**PRE-DEVELOPMENT
HYDROLOGY MAP**
OPTIMUS LOGISTICS CENTER 2
PREPARED: NOV. 18, 2014

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT



VICINITY MAP
NTS

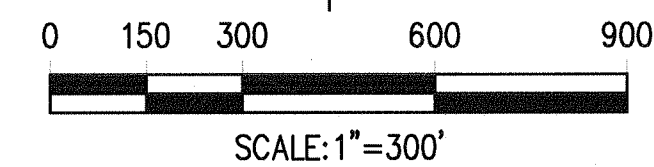


MARKHAM STREET

INDEX MAP
SCALE: 1"=300'



LEGEND:
T-1 □ APPROXIMATE LOCATION BORING HOLES



LEGEND AND ABBREVIATION:

- ⊙ — AT
- — BORING LOCATION
- ⊕ / C/L — CENTERLINE
- E= — EASTING
- 10" F — FIRE LINE AND PIPE SIZE
- L~ — APPROXIMATE LENGTH OF PIPE
- 100 HGL — HYDRAULIC GRADE LINE (100-YEAR FREQUENCY)
- N= — NORTHING
- Q100 — DISCHARGE (100-YEAR FREQUENCY)
- R/W — RIGHT OF WAY
- S = — SLOPE
- V = — DEPTH OF CATCH BASIN
- V100 — VELOCITY (100-YEAR FREQUENCY)
- W = — WIDTH OF CURB OPENING
- 1"W — WATER LINE AND PIPE SIZE
- 5'Wx4'H — WIDTH AND HEIGHT OF BOX CULVERT
- A.C. — ASPHALT CONCRETE
- APRX. — APPROXIMATE
- AVE. — AVENUE
- B.C. — BEGINNING OF CURVE
- CB — CATCH BASIN
- CFS. — CUBIC FEET PER SECOND
- CIP — CAST IN PLACE
- CLF. — CHAIN LINK FENCE
- CLR. — CLEAR
- CONST. — CONSTRUCT
- DWG. — DRAWING
- E.C. — END OF CURVE
- ELEV. — ELEVATION
- E.P. — EDGE OF PAVEMENT
- ETW — EXISTING TELEPHONE
- EX./EXIST. — EXISTING
- F.G. — FINISH GRADE
- F.H. — FIRE HYDRANT
- F.L. — FLOW LINE
- FPS. — FEET PER SECOND
- F.S. — FINISH SURFACE
- FUT. — FUTURE
- G.B. — GRADE BREAK
- GV — GATE VALVE
- H.P. — HIGH POINT
- INT. — INTERSECTION
- INV. — INVERT
- LAT. — LATERAL PIPE
- L.F. — LINEAR FEET
- LOC. — LOCATION
- L.P. — LOW POINT
- MIN. — MINIMUM
- M.H. — MANHOLE
- MISC. — MISCELLANEOUS
- NG — NATURAL GRADE
- NGGB — NATURAL GRADE GRADE BREAK
- PP — POWER POLE
- PROP. — PROPOSED
- R.C.B. — REINFORCED CONCRETE BOX
- R.C.P. — REINFORCED CONCRETE PIPE
- S.D. — STORM DRAIN
- S.F. — SQUARE FEET
- SMH — SEWER MANHOLE
- STA. — STATION
- STD. — STANDARD
- ST. — STREET
- ST.LT. — STREET LIGHT
- T.B. — TOP OF BERM
- T.C. — TOP OF CURB
- TEL. — TELEPHONE LINE
- T.F. — TOP OF FOOTING
- T.G. — TOP OF GRATE
- TP — TELEPHONE PEDESTAL
- T.S. — TRANSITION STRUCTURE
- UC — UTILITY CABINET
- WM — WATER METER

QNTY STORM DRAIN CONSTRUCTION NOTES

- 1 EA (1) REMOVE EXISTING CONCRETE HEADWALL AND WINGWALL WITH TRASH RACK AND CABLE RAILINGS
- 1 EA (2) REMOVE EXISTING TRANSITION STRUCTURE. CONSTRUCT TRANSITION STRUCTURE NO. 2 PER STANDARD DRAWING NO. TS302
- 1 EA (3) REMOVE POWER POLE AND UNDERGROUND LINES
- 5 EA (4) RELOCATE GAS MARKER, NEW LOCATION PER GAS COMPANY SPECIFICATION
- 57 LF (5) REMOVE EXISTING 54" R.C.P. L~65'
- 1,292 LF (6) CONSTRUCT 5'W x 4'H PRE-CAST R.C.B. PER A.P.W.A. STD. 390-0 OR APPROVED EQUAL, SEE JOINT SEALANT NOTE [1] ON SHEET #1
- 4 EA (7) CONSTRUCT MANHOLE NO. 3 PER STANDARD DRAWING NO. MH253
- 4 EA (8) CONSTRUCT JUNCTION STRUCTURE NO. 3 PER R.C.F.C.W.C.D. DRAWING NO. JS228
- 539 LF (9) CONSTRUCT 18" R.C.P. CLASS IV PER PROFILE
- 9 LF (10) CONSTRUCT 24" R.C.P. CLASS IV PER PROFILE
- 78 LF (11) CONSTRUCT 36" R.C.P. CLASS IV PER PROFILE
- 1,929 LF (12) CONSTRUCT 42" R.C.P. D-LOAD PER PROFILE
- 800 LF (13) CONSTRUCT 48" R.C.P. D-LOAD PER PROFILE
- 2 EA (14) CONSTRUCT CONCRETE DROP INLET PER R.C.F.C.W.C.D. DRAWING NO. CB110 H=9", W=50", A=36"
- 1 EA (15) REMOVE AND RELOCATE WATER METER
- 5 EA (16) CONSTRUCT CURB INLET CATCH BASIN PER COUNTY OF RIVERSIDE STD DRAWING NO. 300, ("W" PER PLAN).
- 1 EA (17) CONSTRUCT TRANSITION STRUCTURE NO. 1 PER R.C.F.C.W.C.D. DRAWING NO. TS301
- 2 EA (18) REMOVE AND RELOCATE SIGN
- 1 EA (19) CONSTRUCT MANHOLE NO. 4 PER R.C.F.C.W.C.D. DRAWING NO. MH254
- 8 EA (20) CONSTRUCT CONCRETE BULKHEAD PER R.C.F.C.W.C.D. DRAWING NO. M816
- 8 EA (21) CONSTRUCT MANHOLE NO. 2 PER R.C.F.C.W.C.D. DRAWING NO. MH252
- 3 EA (22) CONSTRUCT SPECIAL CONNECTION TO CATCH BASIN PER R.C.F.C.W.C.D. DRAWING NO. CB109
- 3 EA (23) REMOVE AND RELOCATE UTILITIES
- 1 EA (24) PROTECT IN PLACE EXISTING CONCRETE HEADWALL AND WINGWALL
- 1 EA (25) CONSTRUCT MODIFIED CURB INLET CATCH BASIN PER COUNTY OF RIVERSIDE STD DRAWING NO. 300, DETAILS ON SHEET 14
- 2 EA (26) CONSTRUCT JUNCTION STRUCTURE NO. 2 PER R.C.F.C.W.C.D. DRAWING NO. JS227 TS303 TRANSITION STRUCTURE
- 80 SF (27) CONSTRUCT 10 FEET DIAMETER AND 2 FEET DEEP (MIN.) RIPRAP PAD, DETAILS ON SHEET 14
- 20 LF (28) RELOCATE EXISTING WATER LINE, PIPE SIZE PER PLAN
- 72 SF (29) CONSTRUCT 6"x6"-6" THICK CONCRETE PAD AROUND MANHOLE WITH #4 BARS @ 18" O.C. EACH WAY
- 2,630 LF (30) SAWCUT EXISTING A.C. PAVEMENT AND REPAIR TRENCH SURFACE PER CITY OF PERRIS, DETAILS ON SHEET 14
- 1 EA (31) CONSTRUCT TRANSITION STRUCTURE NO. 2 PER R.C.F.C.W.C.D. DRAWING NO. TS302
- 580 LF (32) SAWCUT EXISTING A.C. PAVEMENT AND CONSTRUCT PIPE TRENCH (WHERE IT OCCURS) PER CITY OF PERRIS CITY STANDARD UTILITY TRENCH SURFACE REPAIR (PIPES TO BE MAINTAINED BY CITY OF PERRIS ONLY) DETAILS ON SHEET 14
- 1 EA (33) NEW LOCATION WATER METER
- 2 EA (34) CONSTRUCT CONCRETE COLLAR PER R.C.F.C.W.C.D. DRAWING NO. M803
- 1 EA (35) CONSTRUCT CONCRETE ENCASEMENT PER R.C.F.C.W.C.D. DRAWING NO. M808 LENGTH OF ENCASEMENT "L" PER PLAN
- 5 EA (36) RELOCATE EXISTING TELEPHONE CONDUIT
- N/A (37) RELOCATE EXISTING GAS LINE
- 1 EA (38) CONSTRUCT 12" R.C.P. CLASS IV PER PROFILE
- 11 EA (39) EXISTING R.C.B. AND TRANSITION STRUCTURE JOINT DETAIL ON SHEET 2
- 40 LF (40) PRE-CAST R.C.B. AND CAST IN PLACE R.C.B. JOINT DETAIL ON SHEET 3
- 40 LF (41) CONSTRUCT 5'W x 4'H R.C.B. PER CALTRANS STD. D-80

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 (20) 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 (NGVD 1929).
8. ALL COORDINATES ARE SHOWN IN FEET AND DECIMALS THEREOF BASED ON THE NORTH AMERICAN DATUM (NAD 83), CALIFORNIA COORDINATE SYSTEM (CCS), ZONE 6 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) SHALL BE USED. THE ENTIRE TRENCH SHALL BE SLURRY EXTENDING 4 INCHES MINIMUM AND 12 INCHES MAXIMUM ABOVE THE TOP OF THE PIPE.
15. T-1 INDICATES SOIL BORING LOCATIONS BASED ON THE SOILS REPORT DATED 11-1-2016. 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 ON THE INSIDE OF ALL REINFORCED CONCRETE PIPES MUST BE INCREASED TO PROVIDE A MINIMUM OF 1-1/2 INCHES OVER THE REINFORCING AND INCREASED TO A MINIMUM OF 3-1/2 INCHES OVER 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.

TITLE	INDEX	SHEET NO.:
TITLE SHEET		1
PLAN & PROFILES		2-12
CONNECTOR PIPE PROFILES AND DETAILS		13-14

NOTE: [1]

FOR PRE-CAST RCB, USE JOINT SEALANT PER APWA STD PLAN 390.0 ALL PRE-CAST RCB JOINTS TO BE SEALED WITH RUBBER BASED PRE-FORMED FLEXIBLE JOINT SEALANT AND CEMENT MORTAR

P8228408
PM 36678

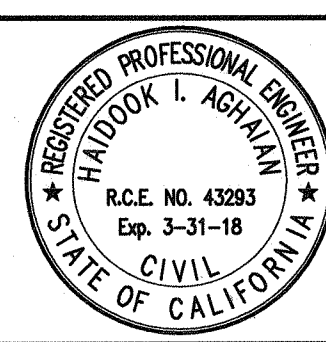
KRL 2/26/2018

CITY OF PERRIS FILE NO. P8-1237

RECORD DRAWINGS
APPROVED: *[Signature]*
DATE: 2/25/2020

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", 43FT. WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE BARRIER (EDGE OF BRIDGE))
ELEVATION = 1474.674' (NGVD '29 / 1898 ADL)

APPROVED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING • LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH: (714) 951-4811, FAX: (714) 951-4173
[Signature] Date: 1/25/18
HAIDOOK AGHAJAN RCE NO. 43293



DESIGNED BY:
EDT
DRAWN BY:
EDT
DATE DRAWN:
[Signature] 2/9/18

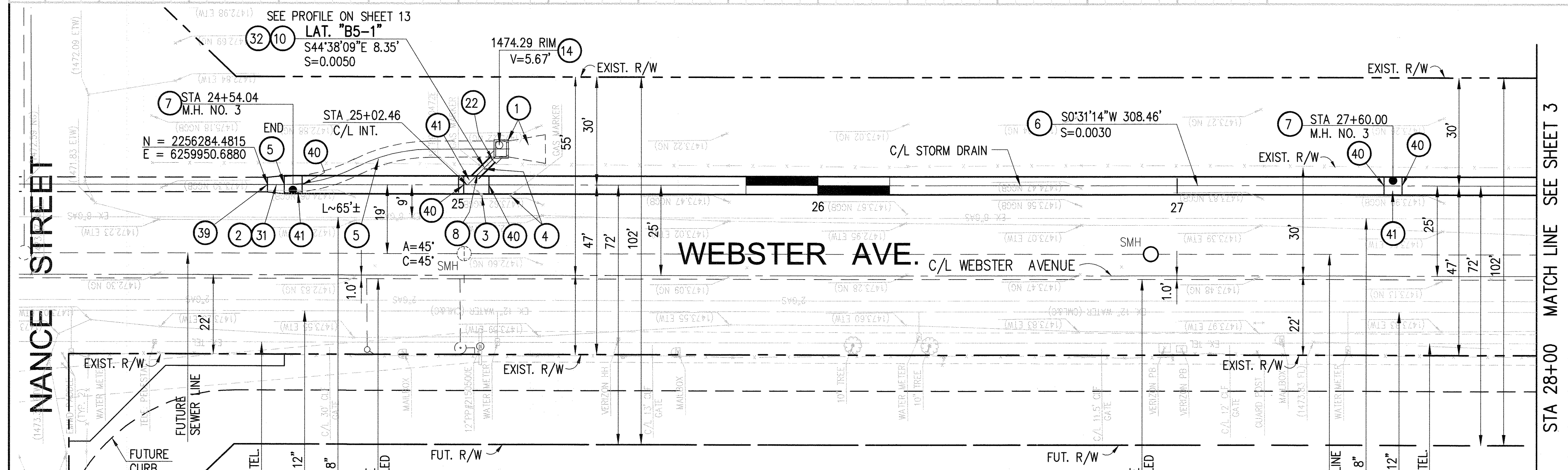
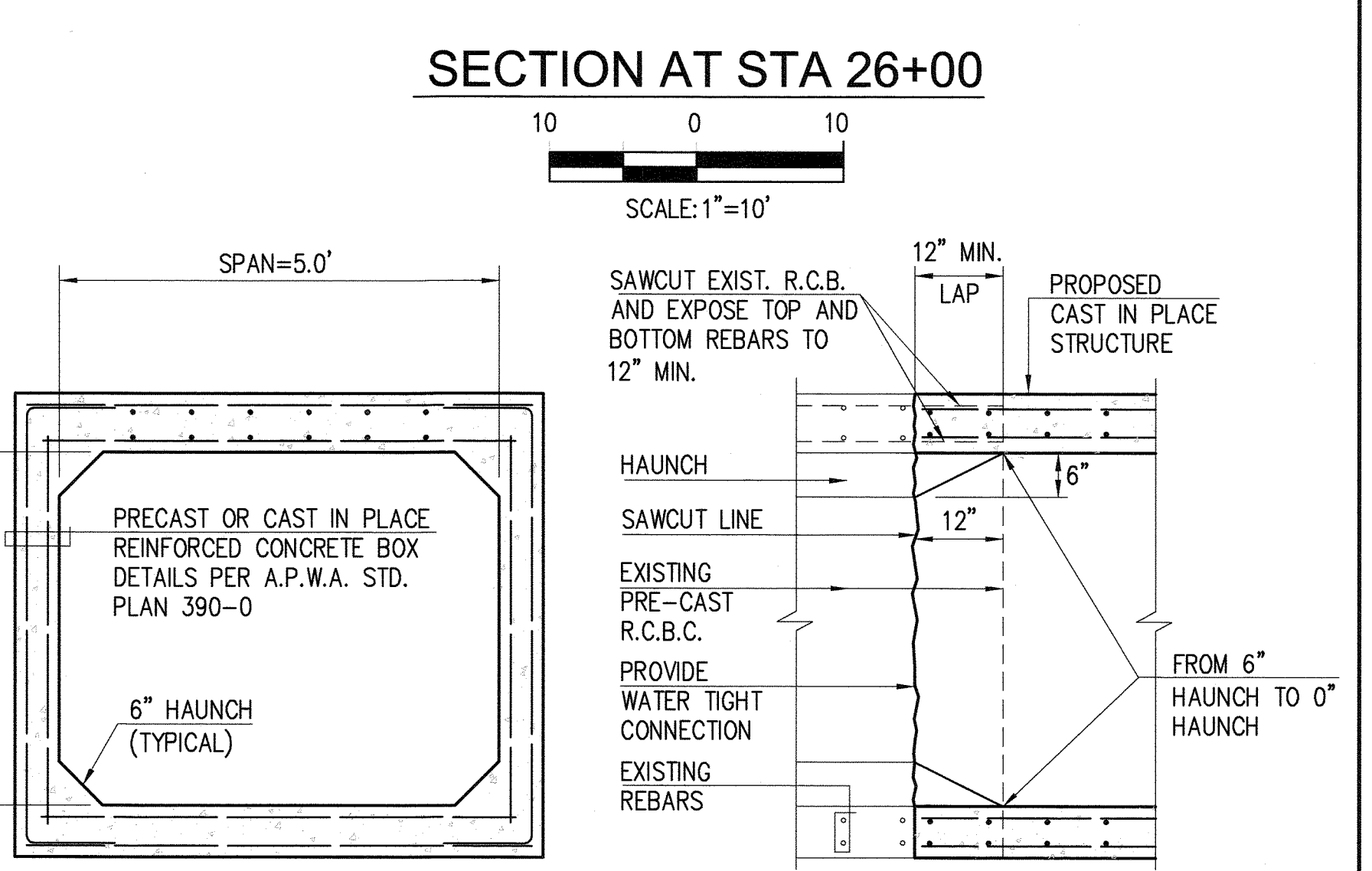
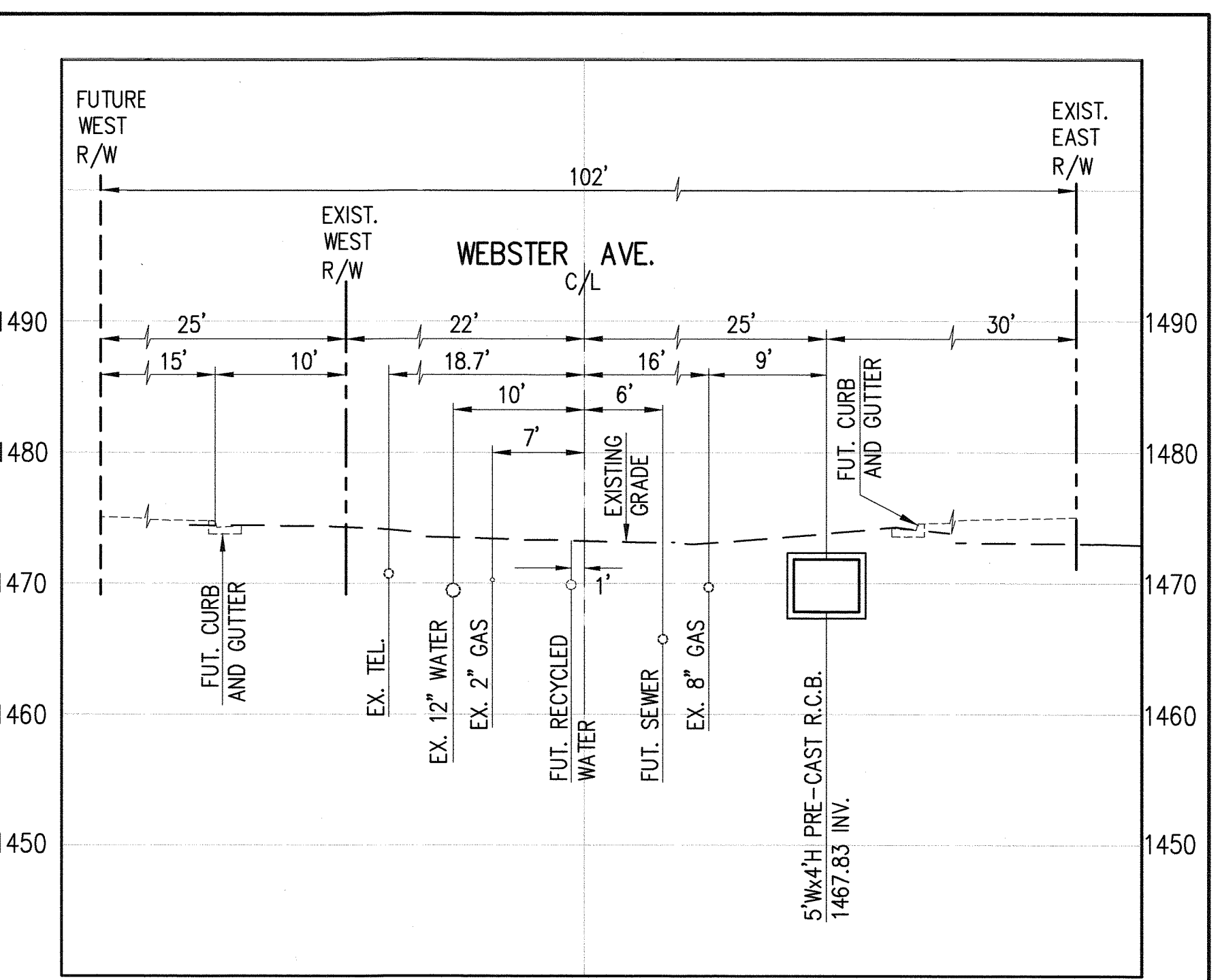
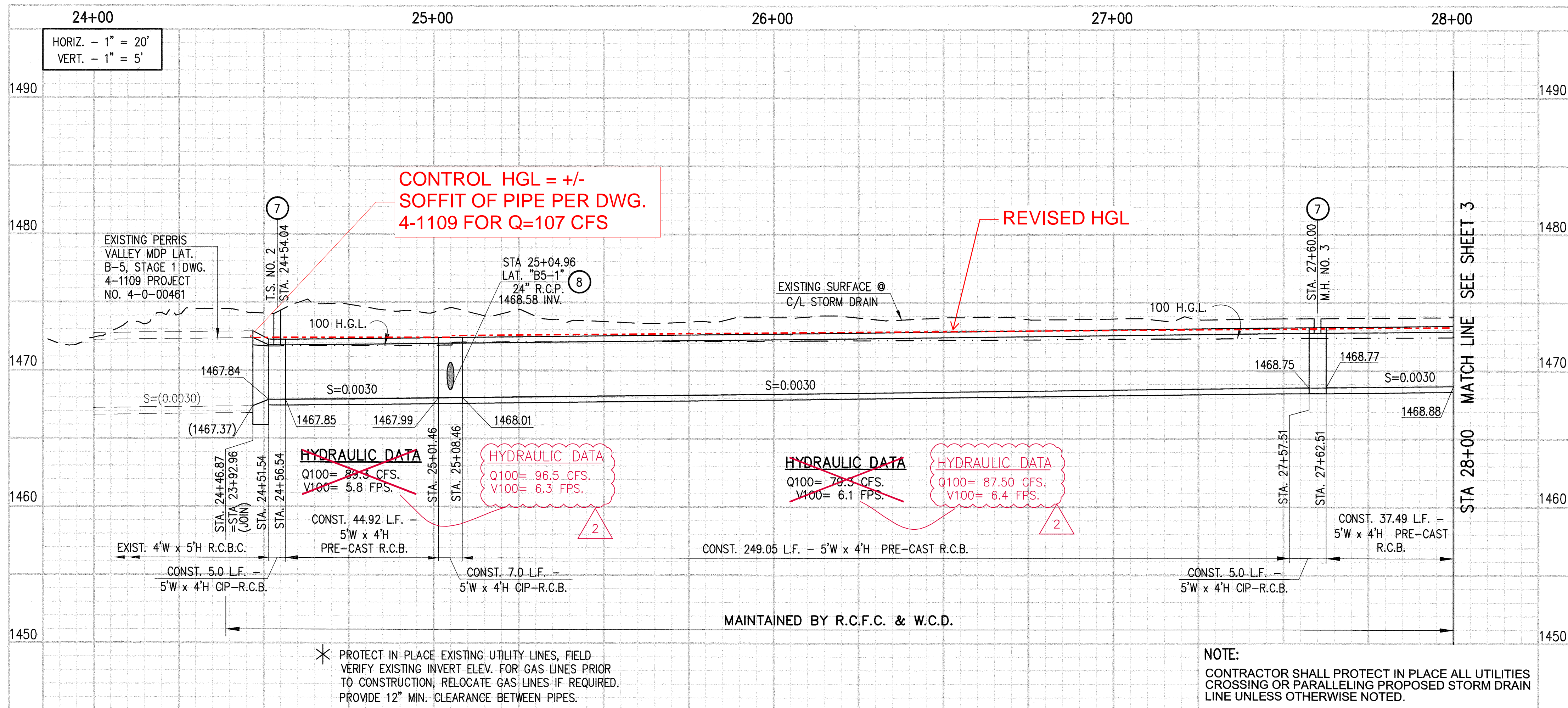
CITY OF PERRIS
CITY ENGINEER
DATE

REVISIONS	ENGINEER	RCFC/
MODIFY CATCH BASIN CONST #25 @ STA. 68+03	HIA	2/2/18
ADD QUANTITY, ADD S.D. SUB-OUT PER P8-1234 PM 37343	HIA	2/9/18
UPDATE "W" & "V" ON SHEET 2. REV. TO 10 & 13. REV. CONST. NO. 38	HIA	2/9/18
REVISE "V" TO 4.5 FOR LAT. RS-3 AND RS-4	HIA	2/9/18
ADD REINFORCED CONC. PAVT SECTION	HIA	2/9/18
ADD TRANSITION STRUCTURE NO. 3 AT STA. 37+23.89 ON SHEET 5	HIA	2/9/18

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY:
[Signature]
PLANNING ENGINEER
DATE: 3-22-2018

PERRIS VALLEY MDP
LATERAL B-5
STAGE 2
TITLE SHEET

PROJECT NO.
4-0-00461
DRAWING NO.
4-1121
SHEET NO.
1 OF 14



- STORM DRAIN CONSTRUCTION NOTES**
- REMOVE EXISTING CONCRETE HEADWALL AND WINGWALL WITH TRASH RACK AND CABLE RAILINGS
 - REMOVE EXISTING TRANSITION STRUCTURE. CONSTRUCT TRANSITION STRUCTURE NO. 2 PER STANDARD DRAWING NO. TS302
 - REMOVE POWER POLE AND UNDERGROUND LINES
 - RELOCATE GAS MARKER, NEW LOCATION PER GAS COMPANY SPECIFICATION
 - REMOVE EXISTING 54" R.C.P. L~65'
 - CONSTRUCT 5' W x 4' H PRE-CAST R.C.B. PER A.P.W.A. STD. 390-0 OR APPROVED EQUAL, SEE JOINT SEALANT NOTE [1] ON SHEET #1
 - CONSTRUCT MANHOLE NO. 3 PER STANDARD DRAWING NO. MH253
 - CONSTRUCT JUNCTION STRUCTURE NO. 3 PER R.C.F.C.W.C.D. DRAWING NO. JS228
 - CONSTRUCT 24" R.C.P. CLASS IV PER PROFILE ON SHEET 13
 - CONSTRUCT CONCRETE DROP INLET PER R.C.F.C.W.C.D. DRAWING NO. CB110 H=9', W=50", A=36°
 - CONSTRUCT SPECIAL CONNECTION TO CATCH BASIN PER R.C.F.C.W.C.D. DRAWING NO. CB109
 - CONSTRUCT TRANSITION STRUCTURE NO. 2 PER R.C.F.C.W.C.D. DRAWING NO. TS302
 - SAWCUT EXISTING A.C. PAVEMENT AND CONSTRUCT PIPE TRENCH (WHERE IT OCCURS) PER CITY OF PERRIS CITY STANDARD UTILITY TRENCH SURFACE REPAIR (PIPES TO BE MAINTAINED BY CITY OF PERRIS ONLY) DETAILS ON SHEET 14
 - EXISTING R.C.B. AND TRANSITION STRUCTURE JOINT DETAIL ON SHEET 2
 - PRE-CAST R.C.B. AND CAST IN PLACE R.C.B. JOINT DETAIL ON SHEET 3
 - CONSTRUCT 5' W x 4' H R.C.B. PER CALTRANS STD. D-80

811
Know what's below.
Call before you dig.
SCALE: 1"=20'

APPROVED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING - LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH: (714) 921-4811 FAX: (714) 921-4173
Haidook Aghaian Date: 1/25/18 RCE NO. 43293

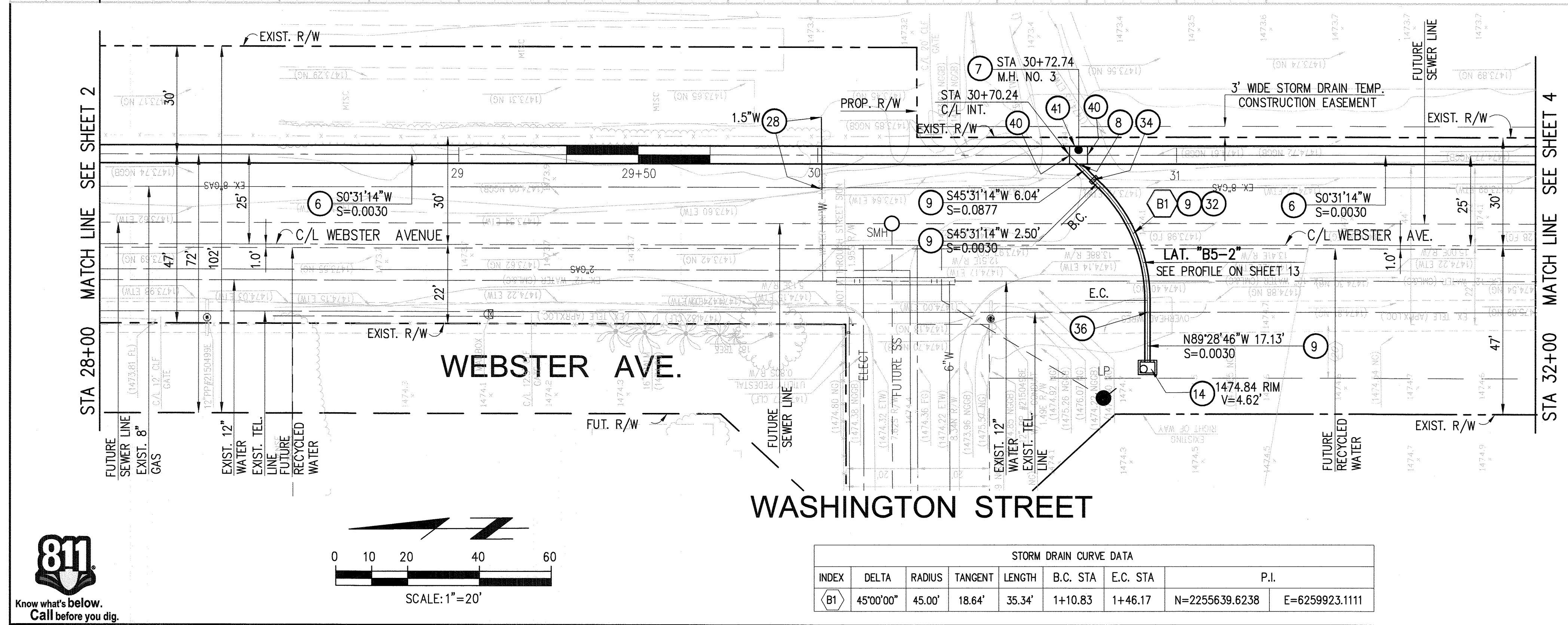
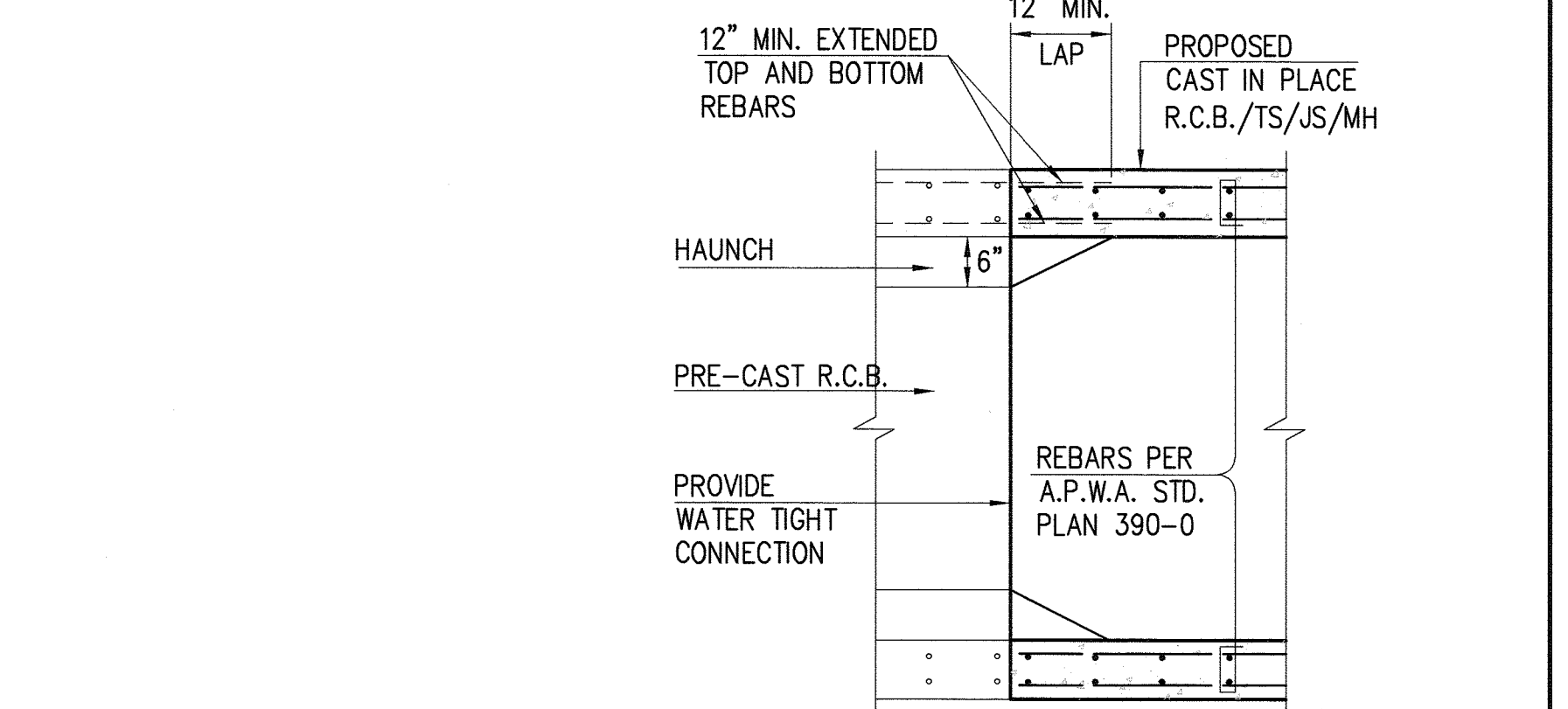
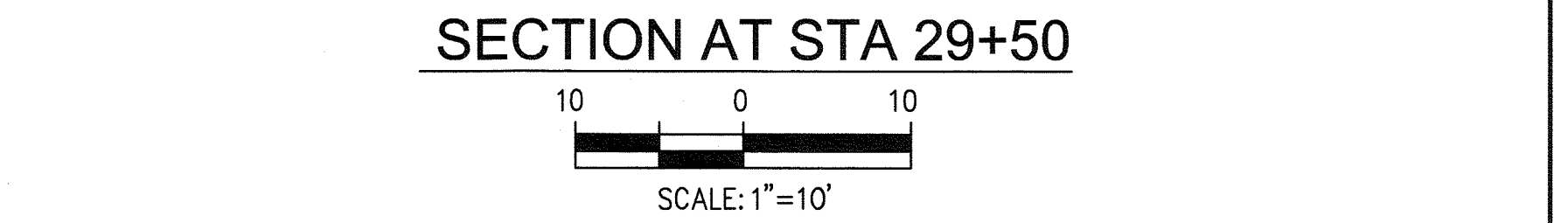
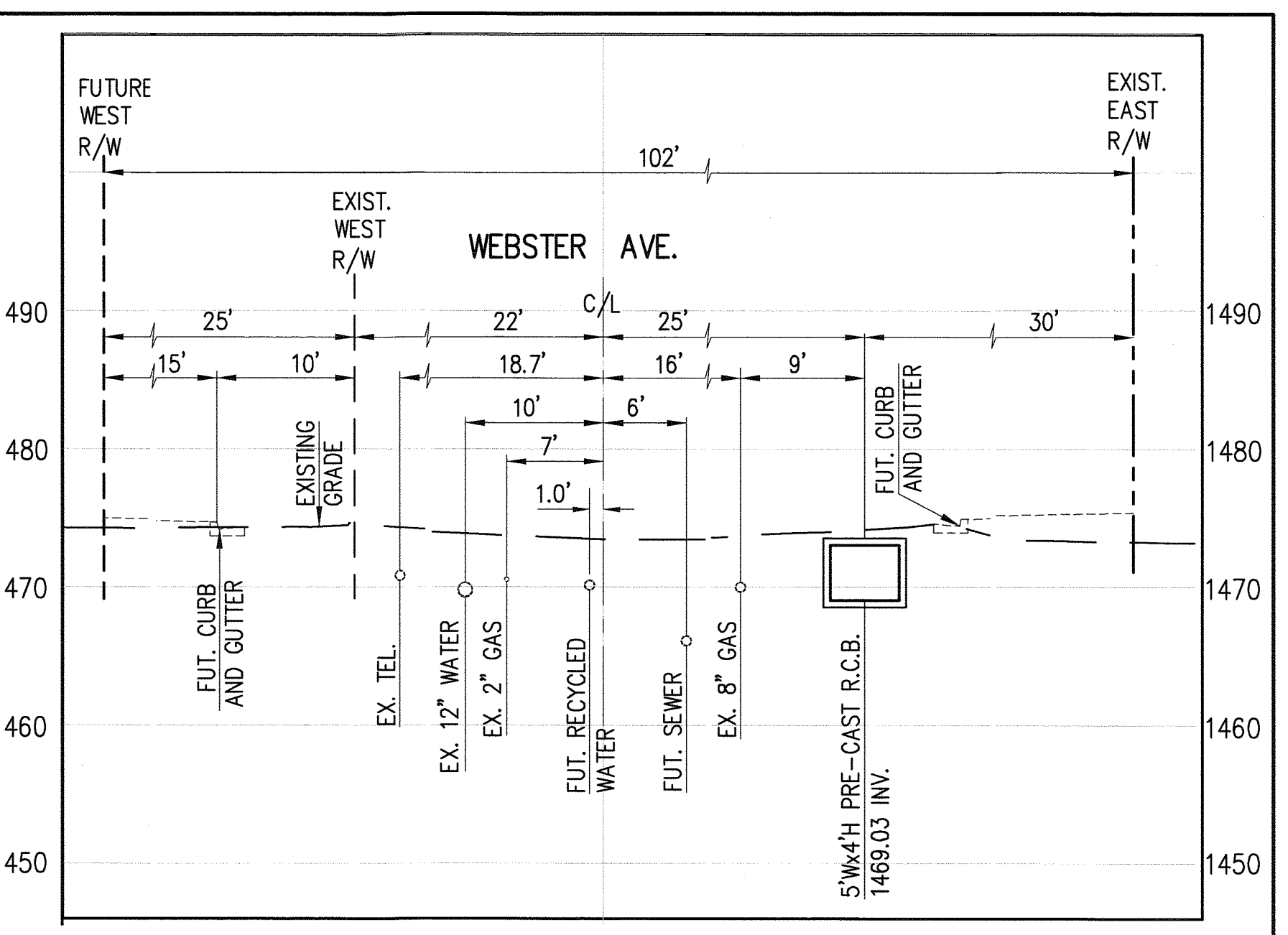
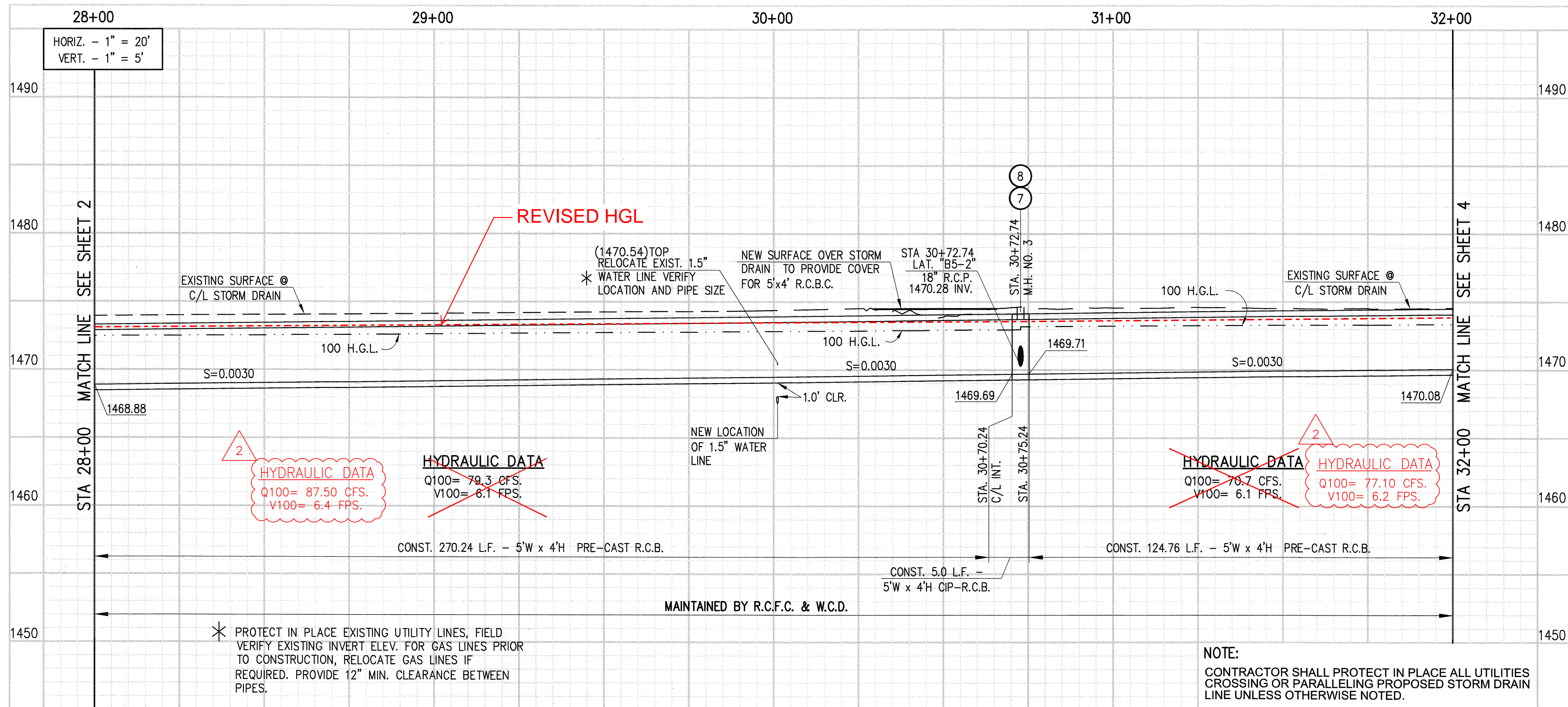
DESIGNED BY: EDT
DRAWN BY: EDT
DATE DRAWN: 2/1/18
CITY OF PERRIS
CITY ENGINEER: [Signature] DATE: 2/1/18

RECORD DRAWINGS
APPROVED: [Signature] DATE: 2/25/2020

REVISIONS	ENGINEER	RCFC/
ADD QUANTITY, ADD S.D. SUB-OUT PER P8-1294 PM 37343 UPDATE Q100 & V100, SHT 2 THRU TO & 13, REV. CONST. NO. 38 REVISE Q100 TO 8.3 FPS. & V100 TO 6.4 FPS.	HIA	9/04/18

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: Deborah de Chambeau DATE: 3/15/18
APPROVED BY: [Signature] DATE: 3-22-2018

P81228408 PM 36678
CITY OF PERRIS FILE NO. P8-1237
PERRIS VALLEY MDP LATERAL B-5 STAGE 2 PLAN AND PROFILE STA 24+46.87 TO STA 28+00
PROJECT NO. 4-0-00461
DRAWING NO. 4-1121
SHEET NO. 2 OF 14



- STORM DRAIN CONSTRUCTION NOTES**
- 6 CONSTRUCT 5'W x 4'H PRE-CAST R.C.B. PER A.P.W.A. STD. 390-0 OR APPROVED EQUAL, SEE JOINT SEALANT NOTE [1] ON SHEET #1
 - 7 CONSTRUCT MANHOLE NO. 3 PER STANDARD DRAWING NO. MH253
 - 8 CONSTRUCT JUNCTION STRUCTURE NO. 3 PER R.C.F.C.W.C.D. DRAWING NO. JS228
 - 9 CONSTRUCT 18\"/>

JOINT DETAILS
N.T.S.

RECORD DRAWINGS
APPROVED: *[Signature]*
DATE: 2/25/2020

STORM DRAIN CURVE DATA						
INDEX	DELTA	RADIUS	TANGENT	LENGTH	B.C. STA	P.I.
(B1)	45°00'00"	45.00'	18.64'	35.34'	1+10.83	1+46.17
					N=2255639.6238	E=6259923.1111

811
Know what's below.
Call 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) 24' EAST, WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE BARRIER (EDGE OF BRIDGE).
ELEVATION = 1474.674' (NOD 29 / 1996 ADA)

APPROVED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING AND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH: (714) 501-4811 FAX: (714) 501-4173

[Signature]
HAIDOOK AGHAIAN
RCE NO. 43293
Date: 1/25/18

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

DESIGNED BY:
EDT

DRAWN BY:
EDT

DATE DRAWN:
2/15/18

CITY OF PERRIS
[Signature]
CITY ENGINEER
DATE

REVISIONS	ENGINEER	RCFC/
ADD QUANTITY, ADD S.D. STUB-OUT PER P8-1294 PM 37343 UPDATE Q100 & V100, SHT. 2 FROM 10 TO 13, REV. CONST. NO. 38 REVISE CBS-TC & V-FOR LAT. BS-3 AND BS-4	HIA	9/04/18

RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT

RECOMMENDED FOR APPROVAL BY:
[Signature]
DATE: 3/15/18

APPROVED BY:
[Signature]
DATE: 3-22-2018

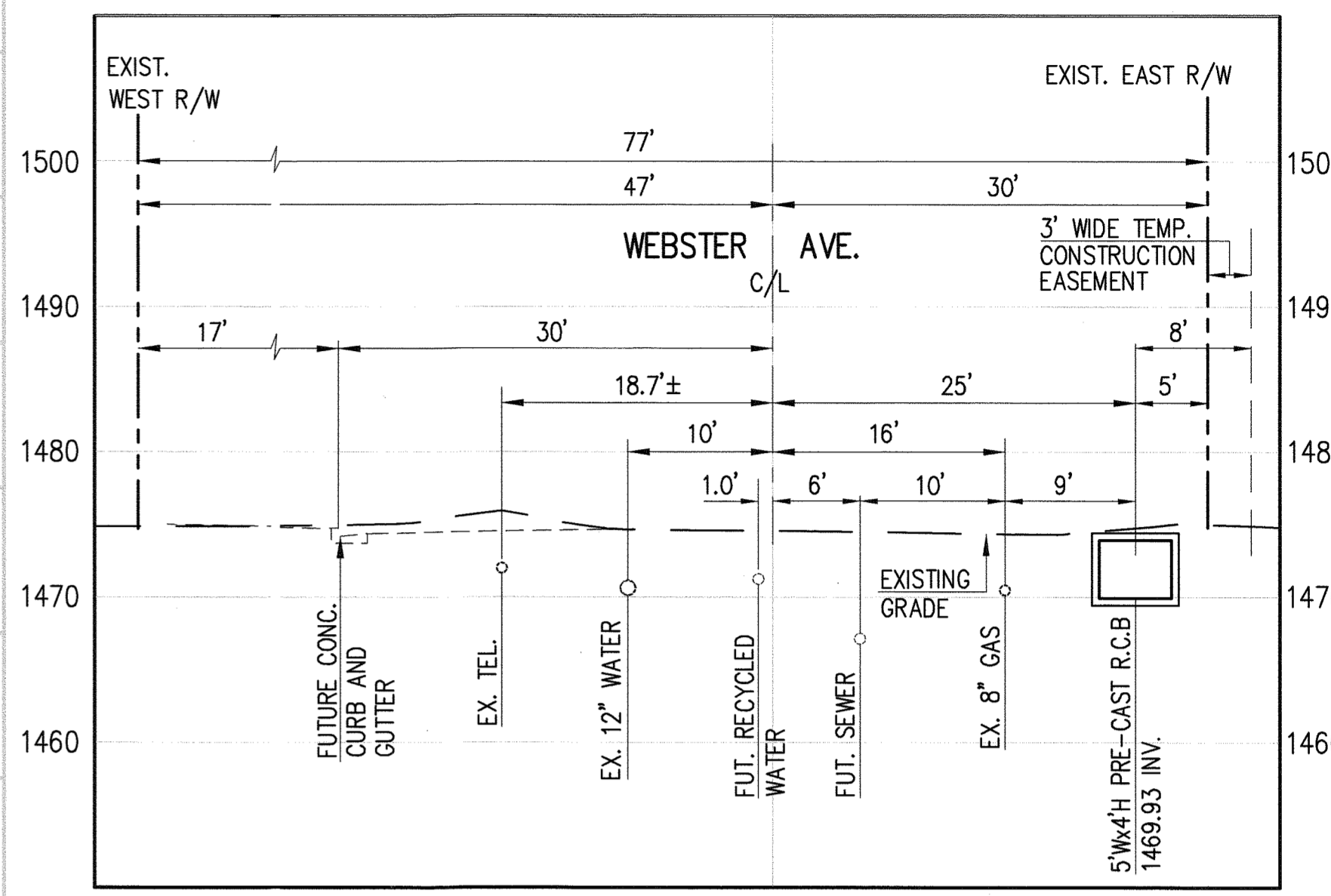
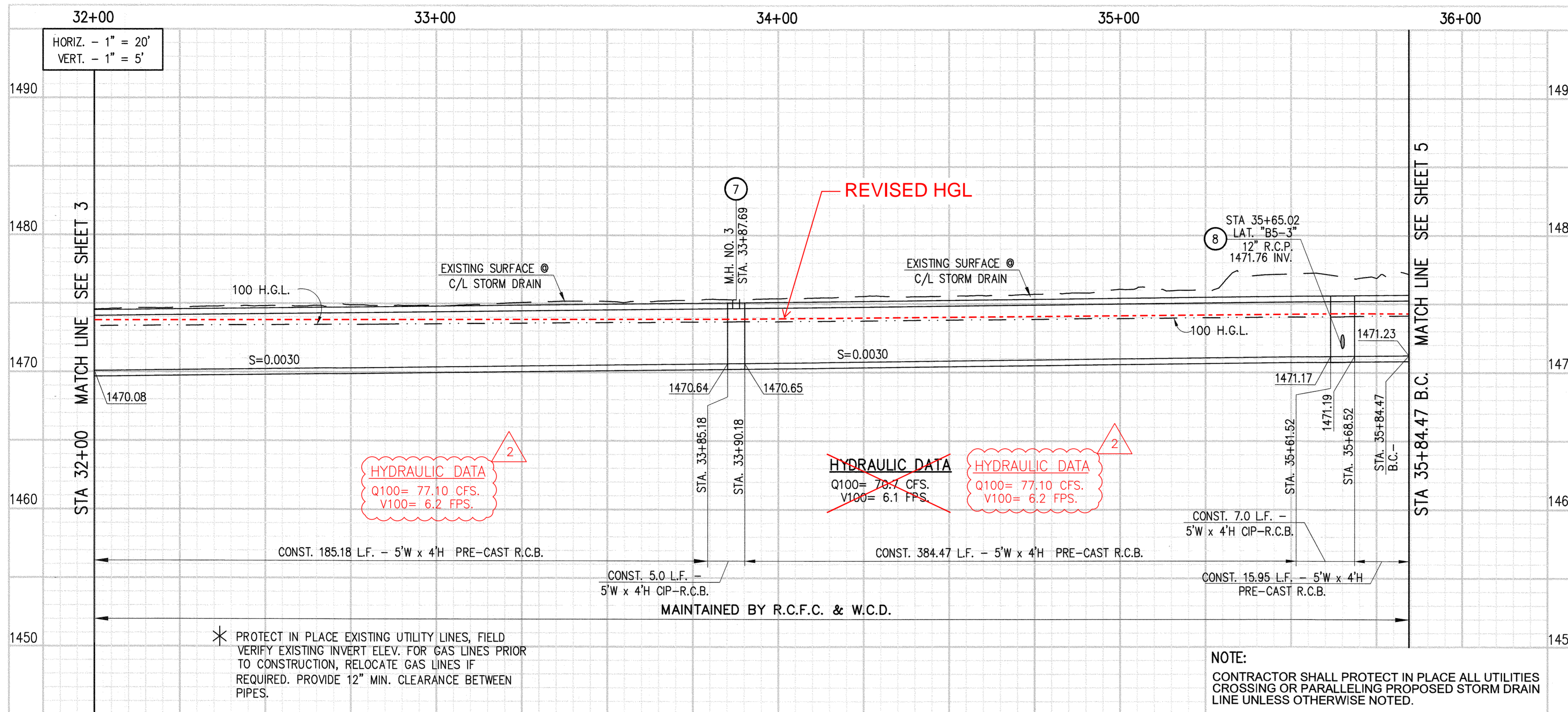
PERRIS VALLEY MDP
LATERAL B-5
STAGE 2
PLAN AND PROFILE
STA 28+00 TO STA 32+00

PROJECT NO.
4-0-00461

DRAWING NO.
4-1121

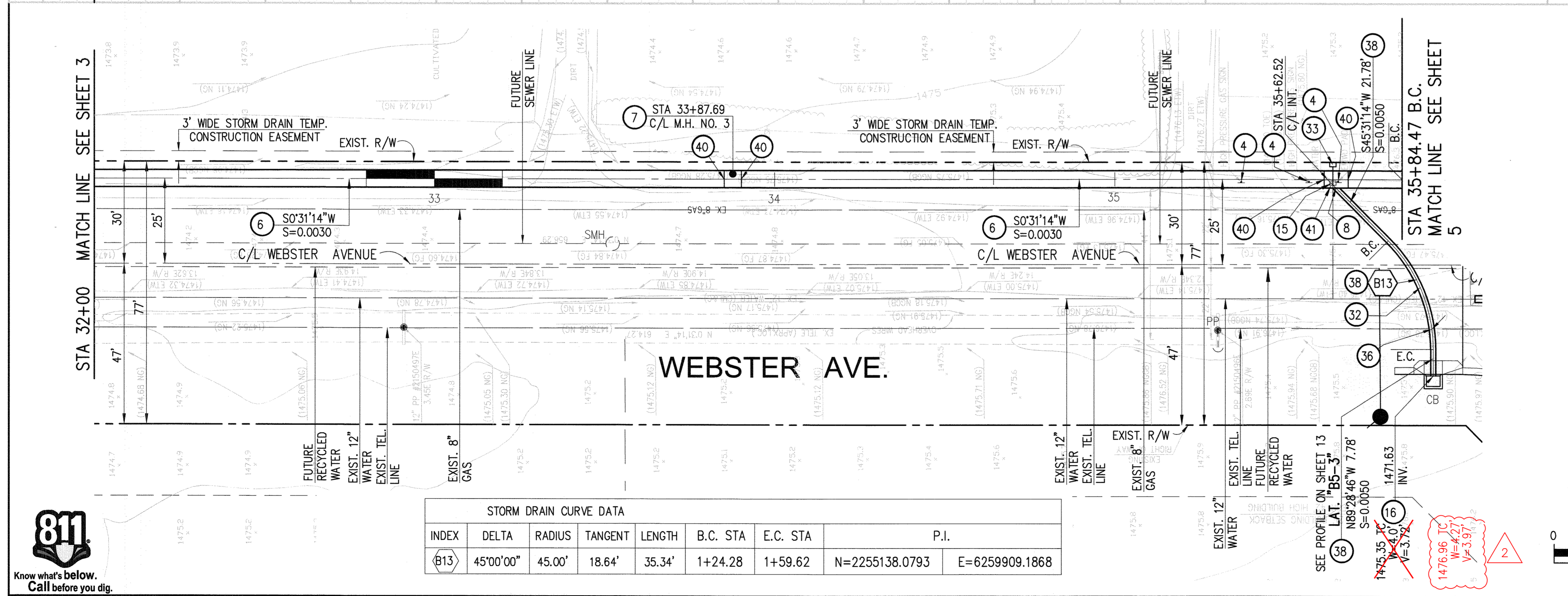
SHEET NO.
3 OF 14

PLOT DATE: 1/23/2018 3:49 PM SAVED DATE: 1/22/2018 12:05 PM
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STORM DRAIN CONSTRUCTION NOTES

- ④ - RELOCATE GAS MARKER, NEW LOCATION PER GAS CC
- ⑥ - CONSTRUCT 5'W x 4'H PRE-CAST R.C.B. PER A.P.W.A. STD. 390-0 OR APPROVED EQUAL, SEE JOINT SEALANT NOTE [1] ON SHEET #1
- ⑦ - CONSTRUCT MANHOLE NO. 3 PER STANDARD DRAWING NO. MH253
- ⑧ - CONSTRUCT JUNCTION STRUCTURE NO. 3 PER R.C.F.C.W.C.D. DRAWING NO. JS228
- ⑮ - REMOVE AND RELOCATE WATER METER
- ⑯ - CONSTRUCT CURB INLET CATCH BASIN PER COUNTY OF RIVERSIDE STD DRAWING NO. 300, ("W" PER PLAN).
- ⑳ - SAWCUT EXISTING A.C. PAVEMENT AND CONSTRUCT PIPE TRENCH (WHERE IT OCCURS) PER CITY OF PERRIS CITY STANDARD UTILITY TRENCH SURFACE REPAIR (PIPES TO BE MAINTAINED BY CITY OF PERRIS ONLY) DETAILS ON SHEET 14
- ㉓ - NEW LOCATION WATER METER
- ㉔ - RELOCATE EXISTING TELEPHONE CONDUIT
- ㉕ - CONSTRUCT 12" R.C.P. CLASS IV PER PROFILE ON SEE SHEET 13
- ㉖ - PRE-CAST R.C.B. AND CAST IN PLACE R.C.B. JOINT DETAIL ON SHEET 3
- ㉗ - CONSTRUCT 5'W x 4'H R.C.B. PER CALTRANS STD. D-80



RECORD DRAWINGS
 APPROVED: *[Signature]*
 DATE: 2/25/2020



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 14' 48" WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE BARRIER, EDGE OF BRIDGE)
 ELEVATION = 1474.674' (NVD) 20 / 1998 ADA

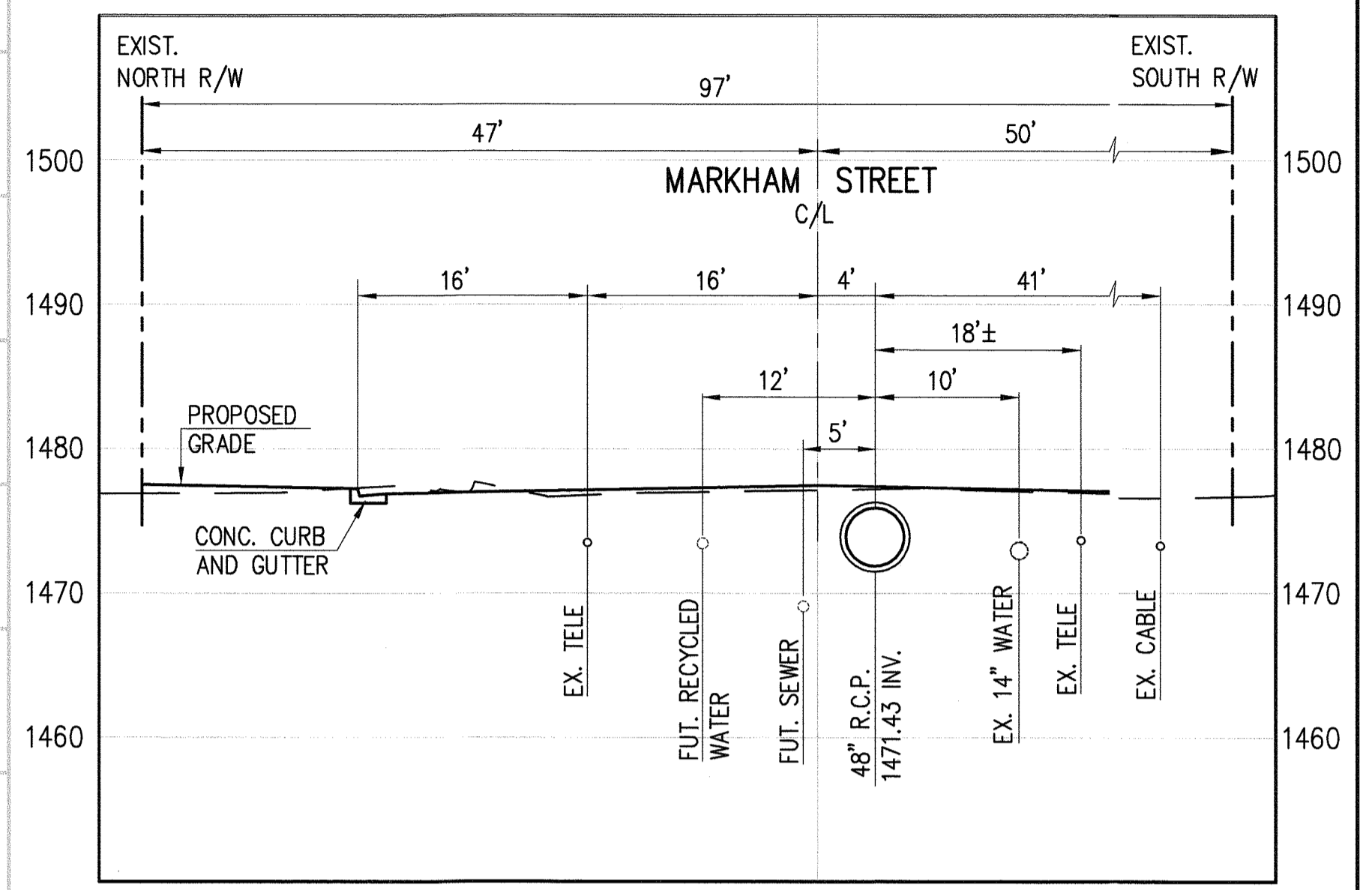
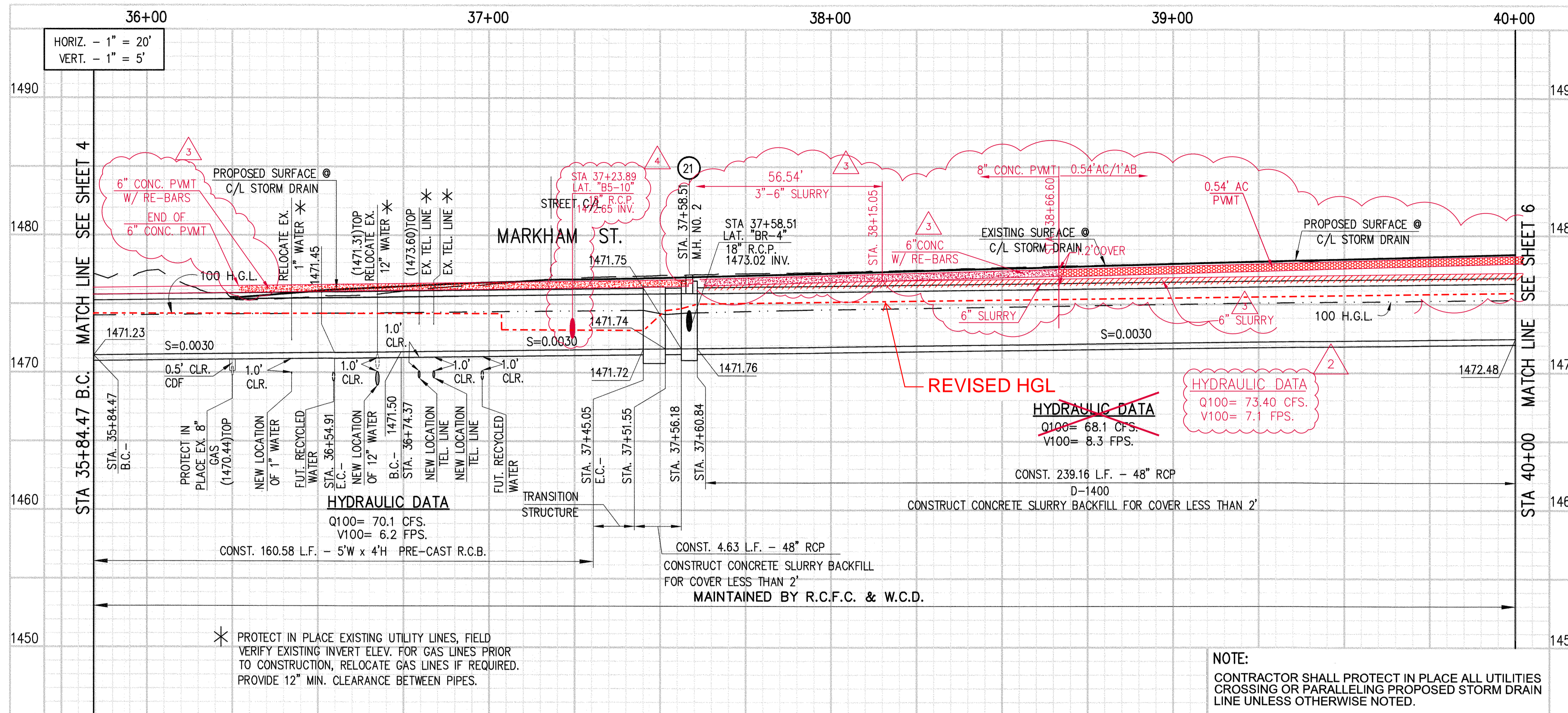
APPROVED BY:
Thienes Engineering, Inc.
 CIVIL ENGINEERING & LAND SURVEYING
 14349 FIRESTONE BOULEVARD
 LA MIRADA, CALIFORNIA 90638
 PH: (714) 521-4811 FAX: (714) 521-4173
[Signature]
 HAIDOOK AGHAIAN RCE NO. 43293

DESIGNED BY: EDT
 DRAWN BY: EDT
 DATE DRAWN: 2/19/18
 CITY ENGINEER: *[Signature]* DATE: 2/19/18

REVISIONS	ENGINEER	RCFC/
ADD QUANTITY, ADD S.D. SUB-OFF PER PB-1294 PM 37343 UPDATE Q100 & V100, SHI. 2 THRU 10 & 13, REV. CONST. NO. 38 REVISE DIS. TO 2' & 4' FOR LAT. 95-3 AND 95-4		

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
 RECOMMENDED FOR APPROVAL BY: *[Signature]*
 APPROVED BY: *[Signature]*
 DATE: 3/15/18 DATE: 3-22-2018

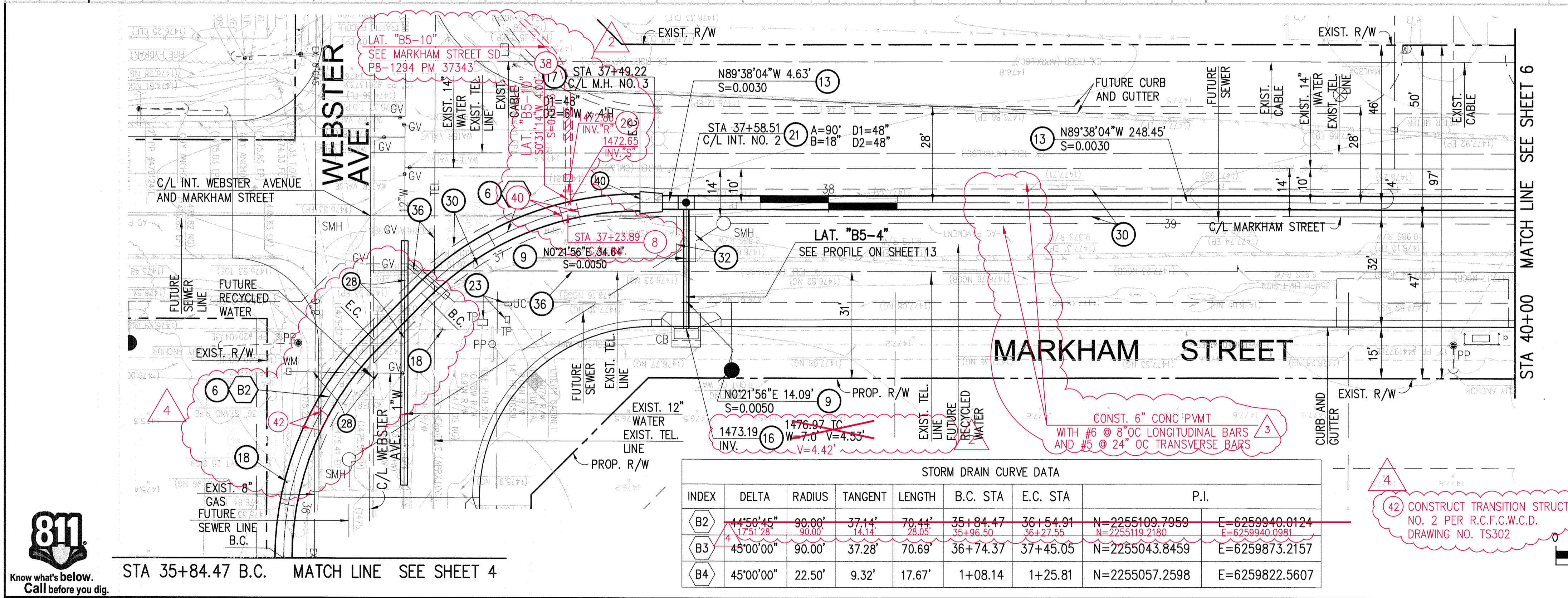
PERRIS VALLEY MDP
 LATERAL B-5
 STAGE 2
 PLAN AND PROFILE
 STA 32+00 TO STA 35+84.47
 PROJECT NO. 4-0-00461
 DRAWING NO. 4-1121
 SHEET NO. 4 OF 14



RECORD DRAWINGS
 APPROVED: *[Signature]*
 DATE: 2/25/2020

SCALE: 1"=10'

- STORM DRAIN CONSTRUCTION NOTES**
- 6 CONSTRUCT 5'W x 4'H PRE-CAST R.C.B. PER A.P.W.A. STD. 390-0 OR APPROVED EQUAL, SEE JOINT SEALANT NOTE [1] ON SHEET #1
 - 9 CONSTRUCT 18" R.C.P. CLASS IV PER PROFILE ON SEE SHEET 13
 - 13 CONSTRUCT 48" R.C.P. D-LOAD PER PROFILE
 - 16 CONSTRUCT CURB INLET CATCH BASIN PER COUNTY OF RIVERSIDE STD DRAWING NO. 300, ("W" PER PLAN).
 - 17 CONSTRUCT TRANSITION STRUCTURE NO. 1 PER R.C.F.C.W.C.D. DRAWING NO. TS301
 - 18 REMOVE AND RELOCATE SIGN
 - 21 CONSTRUCT MANHOLE NO. 2 PER R.C.F.C.W.C.D. DRAWING NO. MH252
 - 23 REMOVE AND RELOCATE UTILITIES
 - 28 RELOCATE EXISTING WATER LINE, PIPE SIZE PER PLAN
 - 30 SAWCUT EXISTING A.C. PAVEMENT AND REPAIR TRENCH SURFACE PER CITY OF PERRIS, DETAILS ON SHEET 14
 - 32 SAWCUT EXISTING A.C. PAVEMENT AND CONSTRUCT PIPE TRENCH (WHERE IT OCCURS) PER CITY OF PERRIS CITY STANDARD UTILITY TRENCH SURFACE REPAIR (PIPES TO BE MAINTAINED BY CITY OF PERRIS ONLY) DETAILS ON SHEET 14
 - 36 RELOCATE EXISTING TELEPHONE CONDUIT
 - 40 PRE-CAST R.C.B. AND CAST IN PLACE R.C.B. JOINT DETAIL ON SHEET 3
 - 8 CONSTRUCT TRANSITION STRUCTURE PER R.C.F.C.W.C.D. DRAWING TS303
 - 20 CONSTRUCT CONCRETE BULKHEAD PER R.C.F.C.W.C.D. DRAWING NO. M816
 - 38 CONSTRUCT 18" R.C.P. CLASS IV STUB



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 Know what's below.
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APPROVED BY:
Thienes Engineering, Inc.
 CIVIL ENGINEERING AND SURVEYING
 14349 FIRESTONE BOULEVARD
 LA MIRADA, CALIFORNIA 90638
 PH: (714) 521-4811 FAX: (714) 521-4173
[Signature] Date: 1/25/18
 RCE NO. 43293

DESIGNED BY:
 EDT
 DRAWN BY:
 EDT
 DATE DRAWN:
 2/19/18

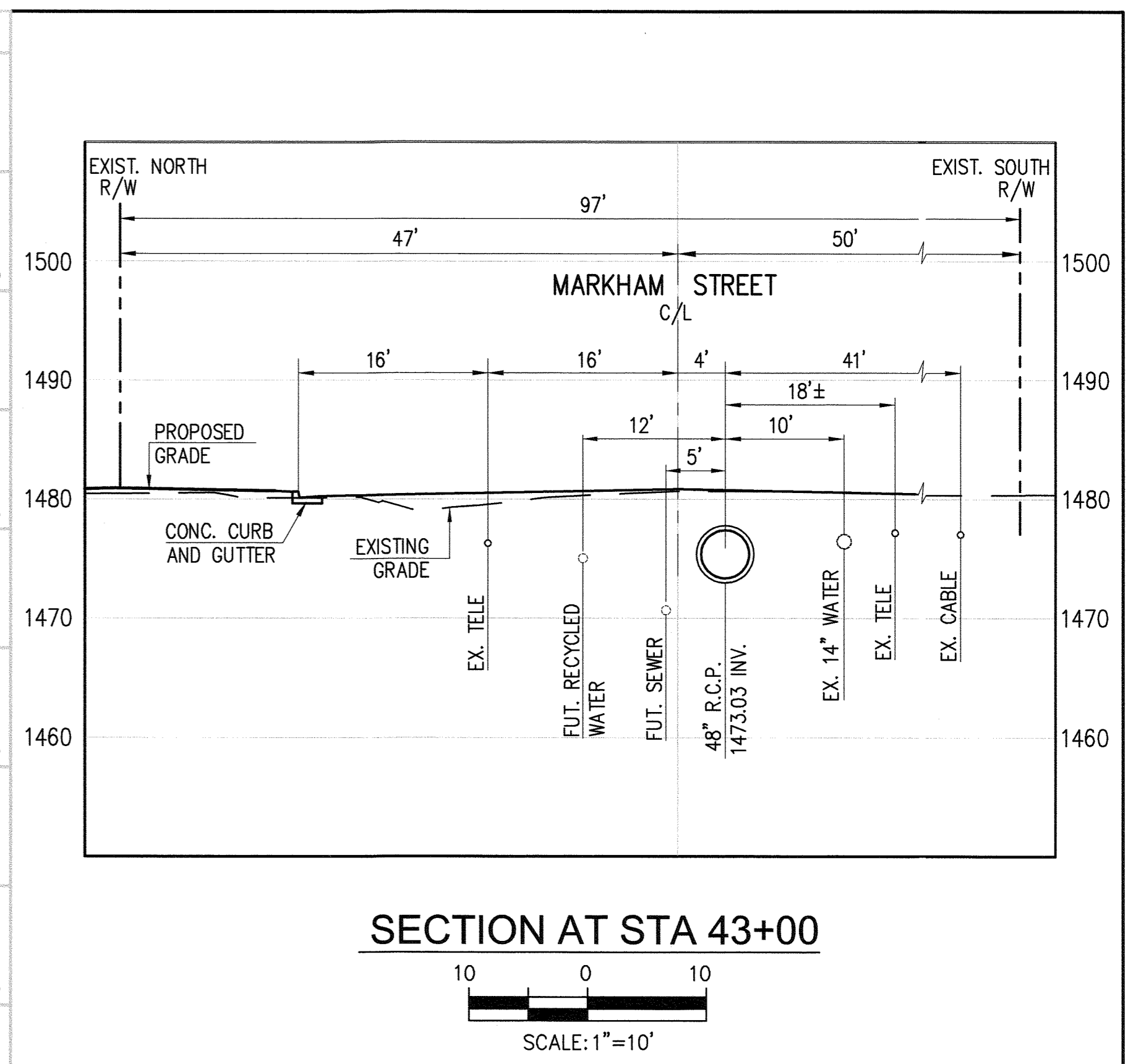
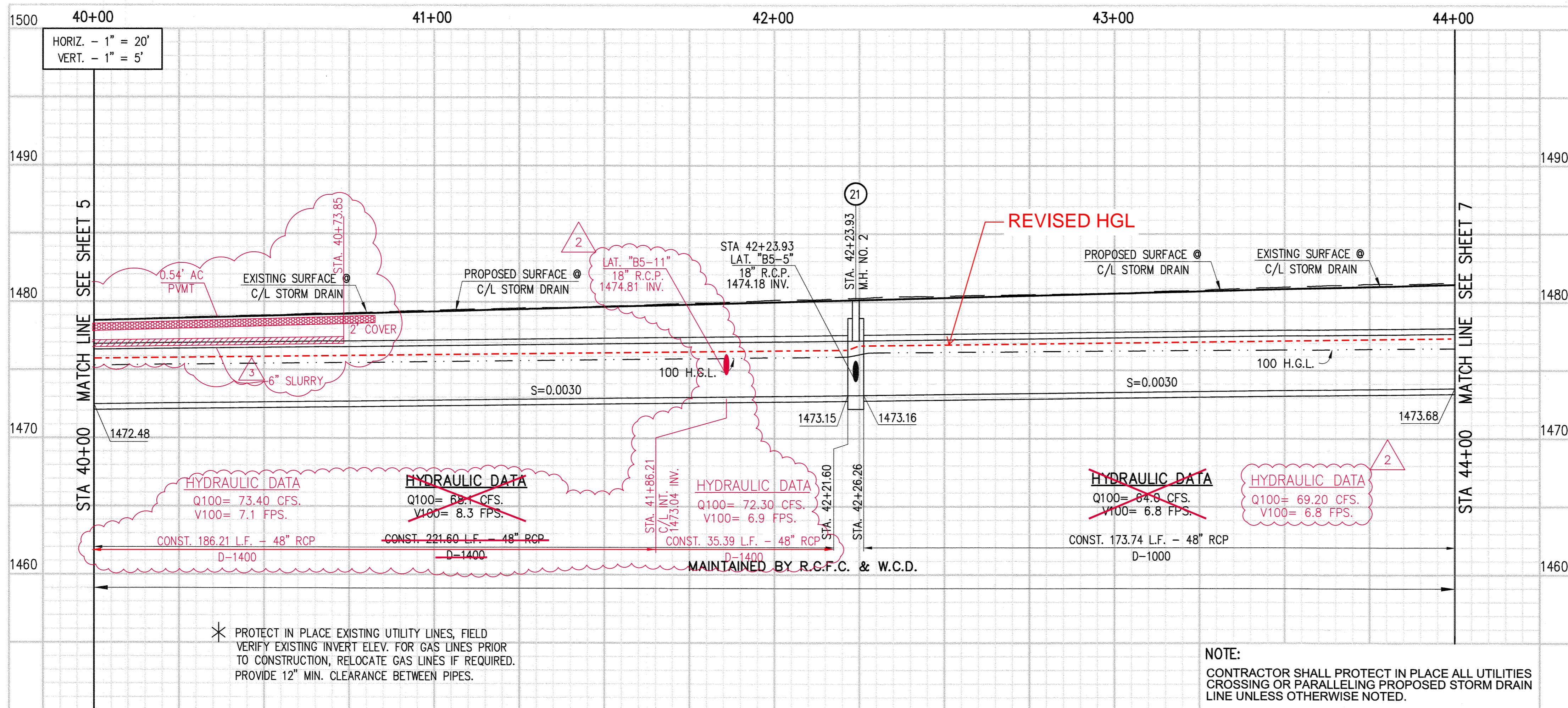
CITY OF PERRIS
 CITY ENGINEER
 DATE

REVISIONS	ENGINEER	RCFC/
ADD QUANTITY, ADD S.D. SUB-OUT PER P8-1294 PM 37343	HIA	9/04/18
REVERSE 0°S TO & V FOR LAT. B5-3 AND B5-4	HIA	8/08/18
ADD REINFORCED CONC. PAVEMENT SECTION	HIA	03/11/19
ADD TRANSITION STRUCTURE NO. 3 AT STA. 37+23.89 ON SHT 5	HIA	02/14/18

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
 RECOMMENDED FOR APPROVAL BY: *[Signature]*
 APPROVED BY: *[Signature]*
 DATE: 3/15/18

PERRIS VALLEY MDP
 LATERAL B-5
 STAGE 2
 PLAN AND PROFILE
 STA 35+84.47 TO STA 40+00

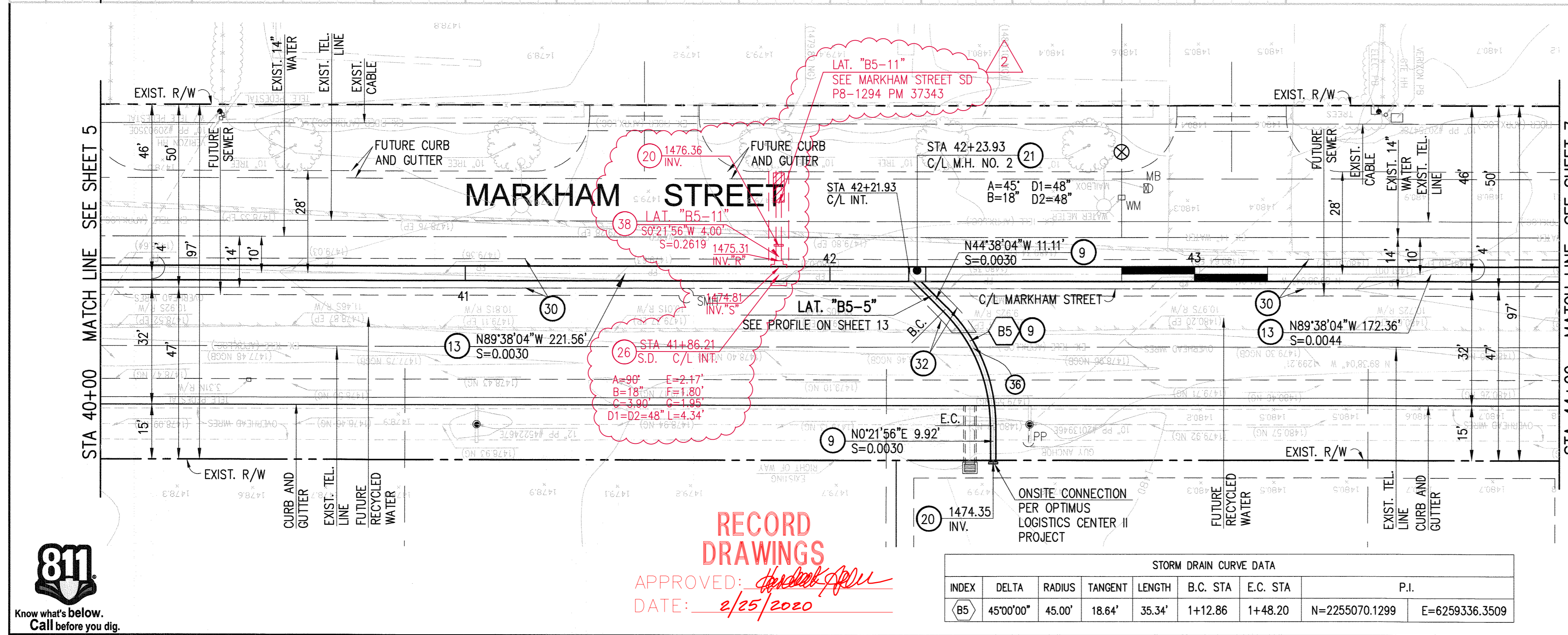
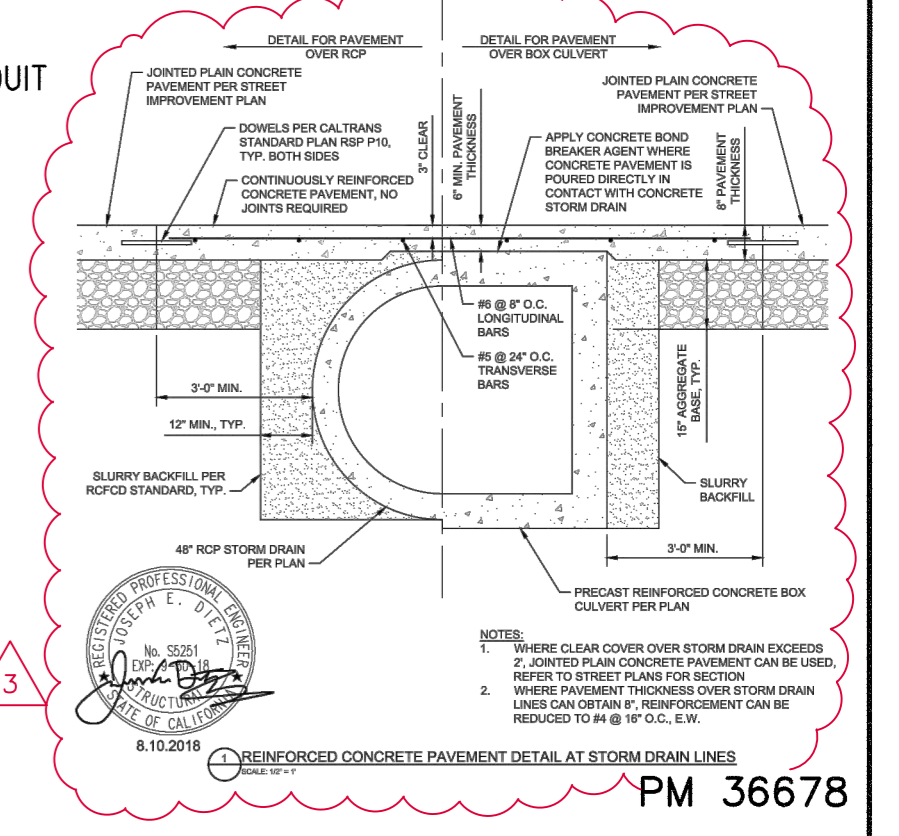
PROJECT NO.
 4-0-00461
 DRAWING NO.
 4-1121
 SHEET NO.
 5 OF 14



- 26 CONSTRUCT TRANSITION STRUCTURE PER R.C.F.C.W.C.D. DRAWING NO. TS303
- 38 CONSTRUCT 18" R.C.P. CLASS IV SUB

STORM DRAIN CONSTRUCTION NOTES

- 9 CONSTRUCT 18" R.C.P. CLASS IV PER PROFILE ON SHEET 13
- 13 CONSTRUCT 48" R.C.P. D-LOAD PER PROFILE
- 20 CONSTRUCT CONCRETE BULKHEAD PER R.C.F.C.W.C.D. DRAWING NO. M816
- 21 CONSTRUCT MANHOLE NO. 2 PER R.C.F.C.W.C.D. DRAWING NO. MH252
- 30 SAWCUT EXISTING A.C. PAVEMENT AND REPAIR TRENCH SURFACE PER CITY OF PERRIS, DETAILS ON SHEET 14
- 32 SAWCUT EXISTING A.C. PAVEMENT AND CONSTRUCT PIPE TRENCH (WHERE IT OCCURS) PER CITY OF PERRIS CITY STANDARD UTILITY TRENCH SURFACE REPAIR (PIPES TO BE MAINTAINED BY CITY OF PERRIS ONLY) DETAILS ON SHEET 14
- 36 RELOCATE EXISTING TELEPHONE CONDUIT



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 14" 48" WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE BARRIER, EDGE OF BRIDGE)
ELEVATION = 1474.674' (NVD '29 / 1998 ADA)

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: 1/25/18
HAIDOOK AGHAIAN R.C.E. NO. 43293

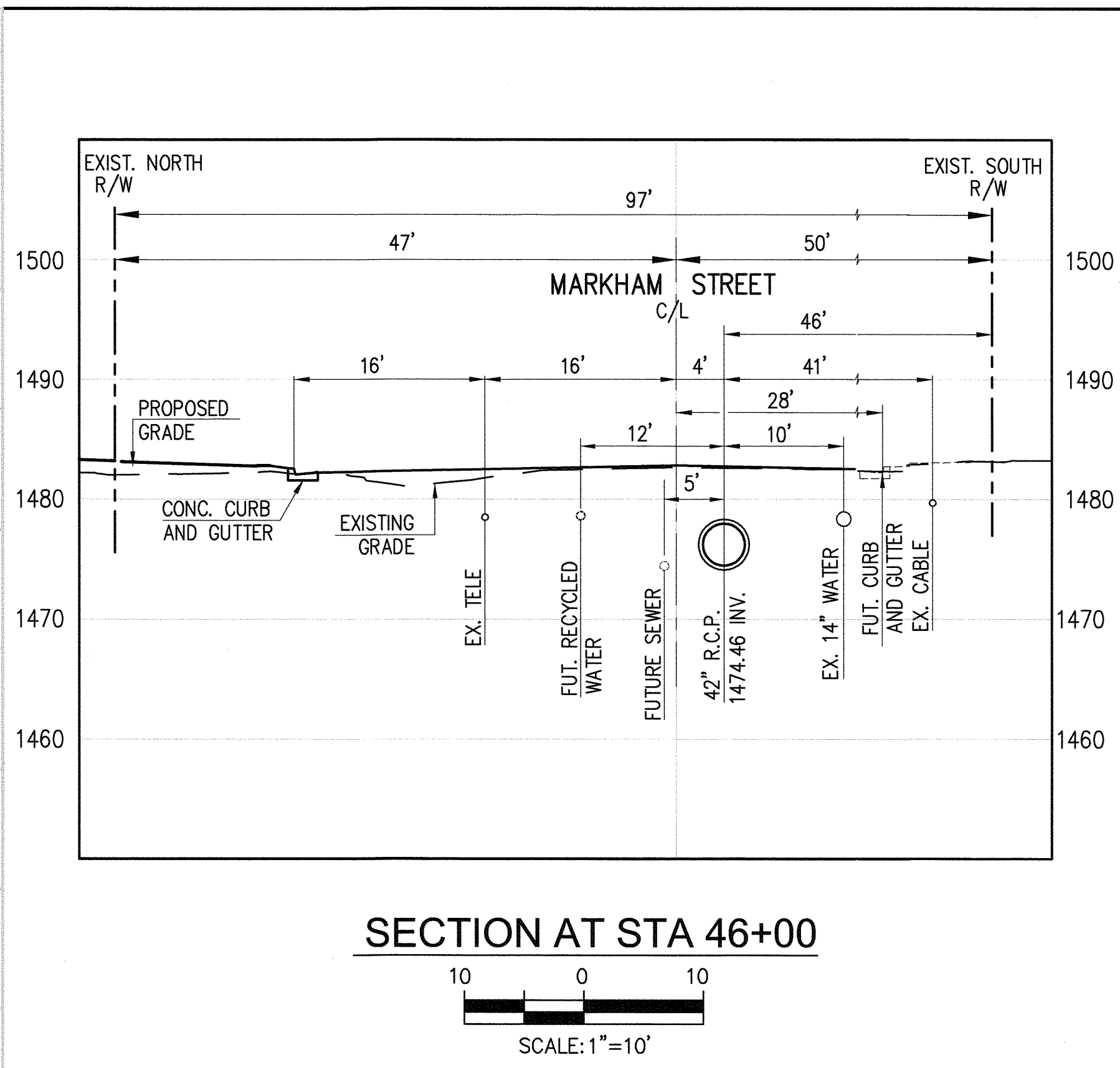
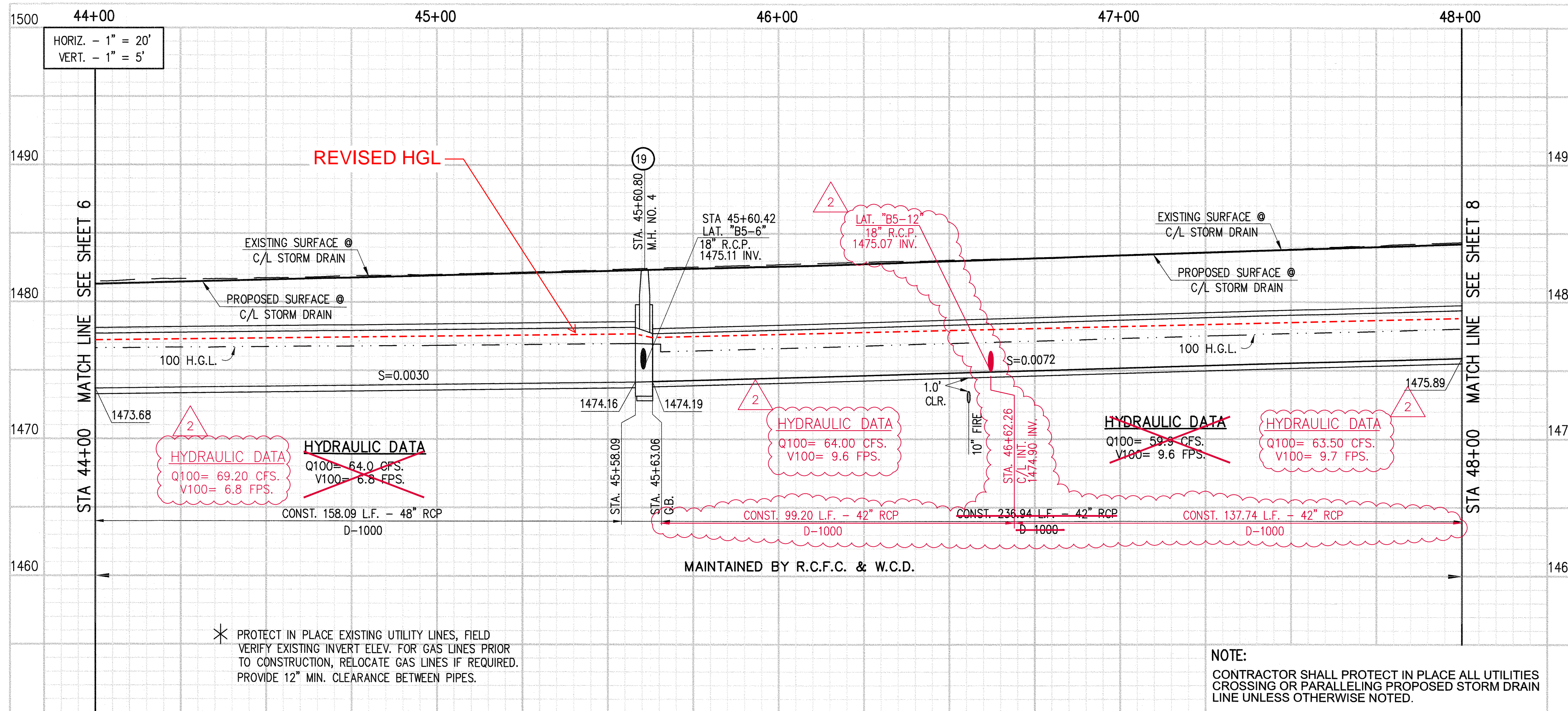
DESIGNED BY: EDT
DRAWN BY: EDT
DATE DRAWN: 2/19/18
CITY ENGINEER
DATE

REVISIONS	ENGINEER	RCFC/
ADD QUANTITY, ADD S.D. SUB-OUT PER P8-1294 PM 37343	HIA	9/04/18
UPDATE Q100 & V100, SHT. 2 THRU TO & 13, REV. CONST. NO. 38	HIA	8/08/18
REVISE Q100 TO 8.3 FPS FOR LAT. B5-3 AND B5-4	HIA	8/08/18
ADD REINFORCED CONC. PAVT SECTION	HIA	8/08/18

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: [Signature]
APPROVED BY: [Signature]
DATE: 3/15/18

PERRIS VALLEY MDP
LATERAL B-5
STAGE 2
PLAN AND PROFILE
STA 40+00 TO STA 44+00

PROJECT NO. 4-0-00461
DRAWING NO. 4-1121
SHEET NO. 6 OF 14



* PROTECT IN PLACE EXISTING UTILITY LINES, FIELD VERIFY EXISTING INVERT ELEV. FOR GAS LINES PRIOR TO CONSTRUCTION, RELOCATE GAS LINES IF REQUIRED. PROVIDE 12" MIN. CLEARANCE BETWEEN PIPES.

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

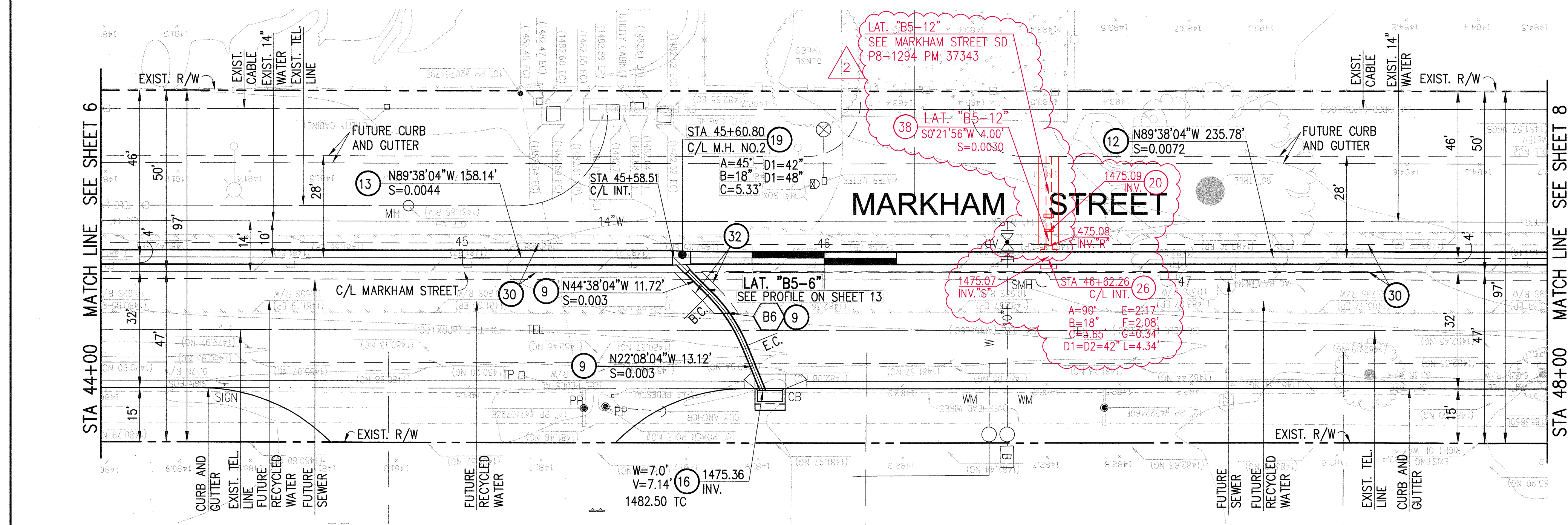
STORM DRAIN CONSTRUCTION NOTES

- 9 - CONSTRUCT 18" R.C.P. CLASS IV PER PROFILE ON SHEET 13
- 12 - CONSTRUCT 42" R.C.P. D-LOAD PER PROFILE
- 13 - CONSTRUCT 48" R.C.P. D-LOAD PER PROFILE
- 16 - CONSTRUCT CURB INLET CATCH BASIN PER COUNTY OF RIVERSIDE STD DRAWING NO. 300, ("W" PER PLAN).
- 19 - CONSTRUCT MANHOLE NO. 4 PER R.C.F.C.W.C.D. DRAWING NO. MH254
- 30 - SAWCUT EXISTING A.C. PAVEMENT AND REPAIR TRENCH SURFACE PER CITY OF PERRIS, DETAILS ON SHEET 14
- 32 - SAWCUT EXISTING A.C. PAVEMENT AND CONSTRUCT PIPE TRENCH (WHERE IT OCCURS) PER CITY OF PERRIS CITY STANDARD UTILITY TRENCH SURFACE REPAIR (PIPES TO BE MAINTAINED BY CITY OF PERRIS ONLY) DETAILS ON SHEET 14
- 20 - CONSTRUCT CONCRETE BULKHEAD PER R.C.F.C.W.C.D. DRAWING NO. M816
- 26 - CONSTRUCT TRANSITION STRUCTURE PER R.C.F.C.W.C.D. DRAWING TS303
- 38 - CONSTRUCT 18" R.C.P. CLASS IV STUB

RECORD DRAWINGS
 APPROVED: *[Signature]*
 DATE: 2/25/2020

P8/228408
 PM 36678

KPA 2/26/2018 CITY OF PERRIS FILE NO. P8-1237

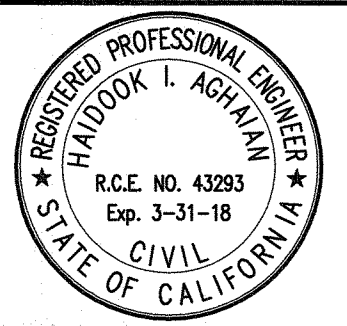


STORM DRAIN CURVE DATA						
INDEX	DELTA	RADIUS	TANGENT	LENGTH	B.C. STA	E.C. STA
B6	22°30'00"	45.00'	8.95'	17.67'	1+13.03	1+30.71
					N=6259006.4905	E=2255065.4791



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 IF CURB LOCATED AT THE CROSSING OF PERRIS BLVD. AND INV. CO. FLOOD CONTROL CHANNEL (PERRIS LATERAL 14" APT. WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE BARRIER. (EDGE OF BRIDGE)
 ELEVATION = 1474.674' (NOV 29 / 1996 ADA)

APPROVED BY:
Thienes Engineering, Inc.
 CIVIL ENGINEERING & LAND SURVEYING
 14349 FIRESTONE BOULEVARD
 LA MIRADA, CALIFORNIA 90638
 PH: (714) 521-4811 FAX: (714) 521-4173
[Signature] Date: 1/25/18
 HADOOK AGHAIAN RCE NO. 43293

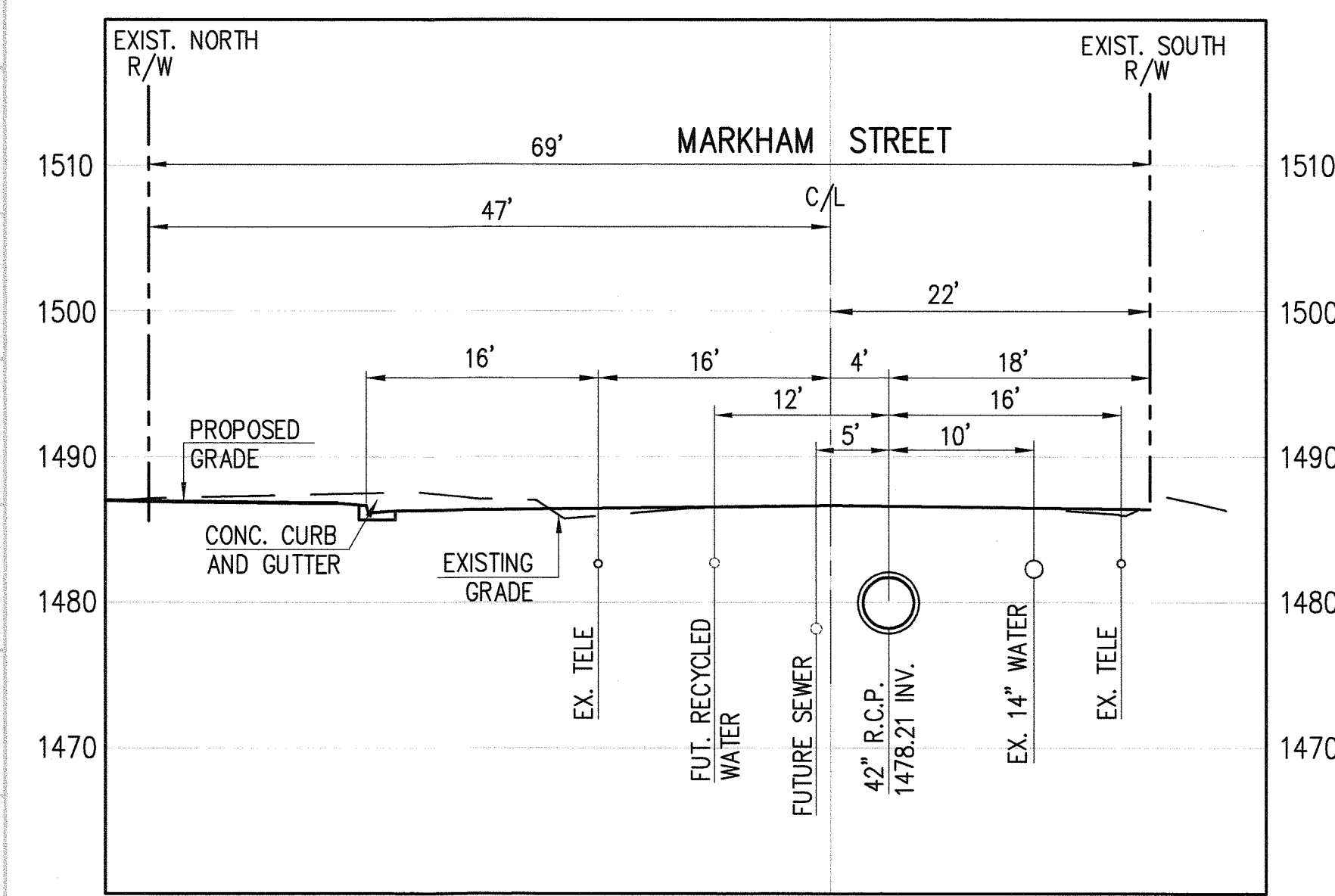
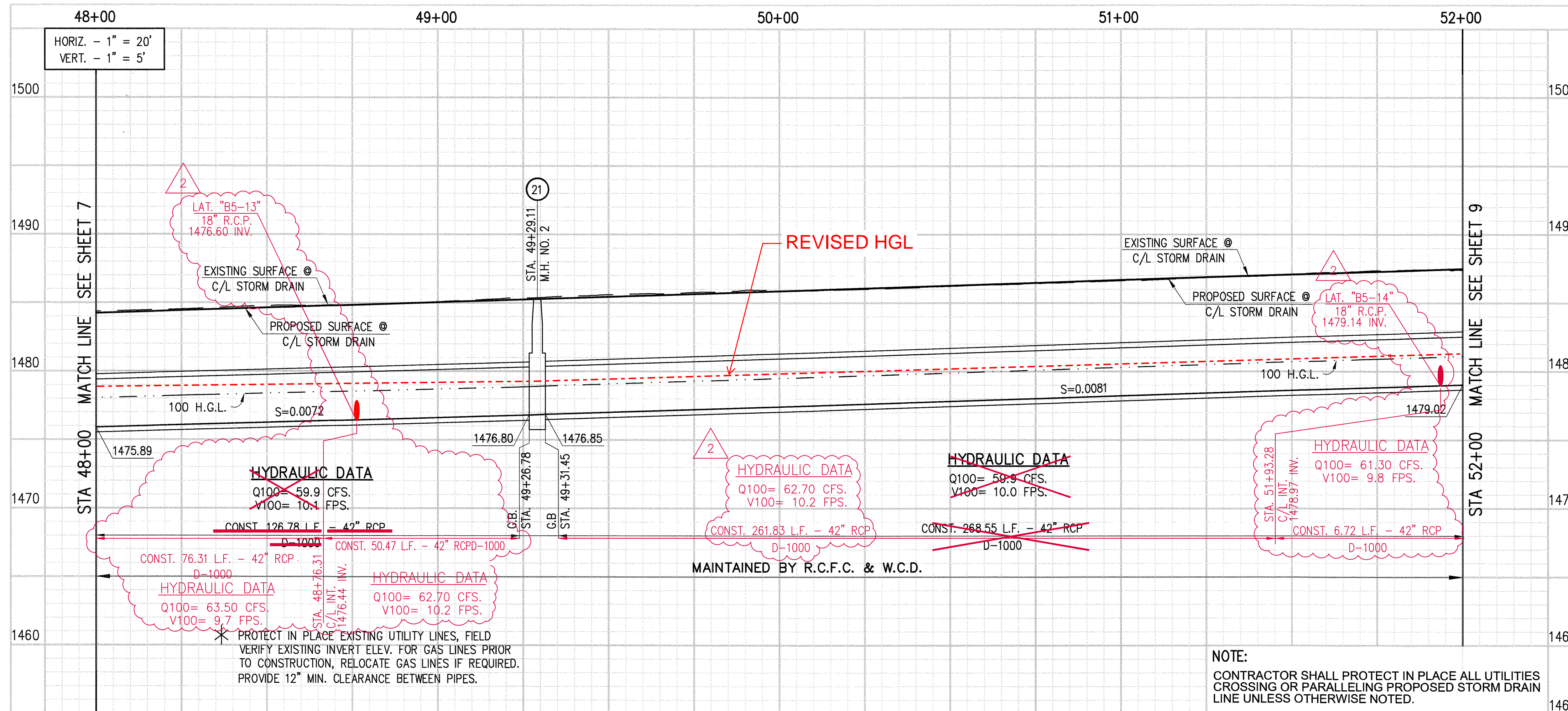


DESIGNED BY: EDT
 DRAWN BY: EDT
 DATE DRAWN: 2/9/18
 CITY OF PERRIS
 For CITY ENGINEER DATE

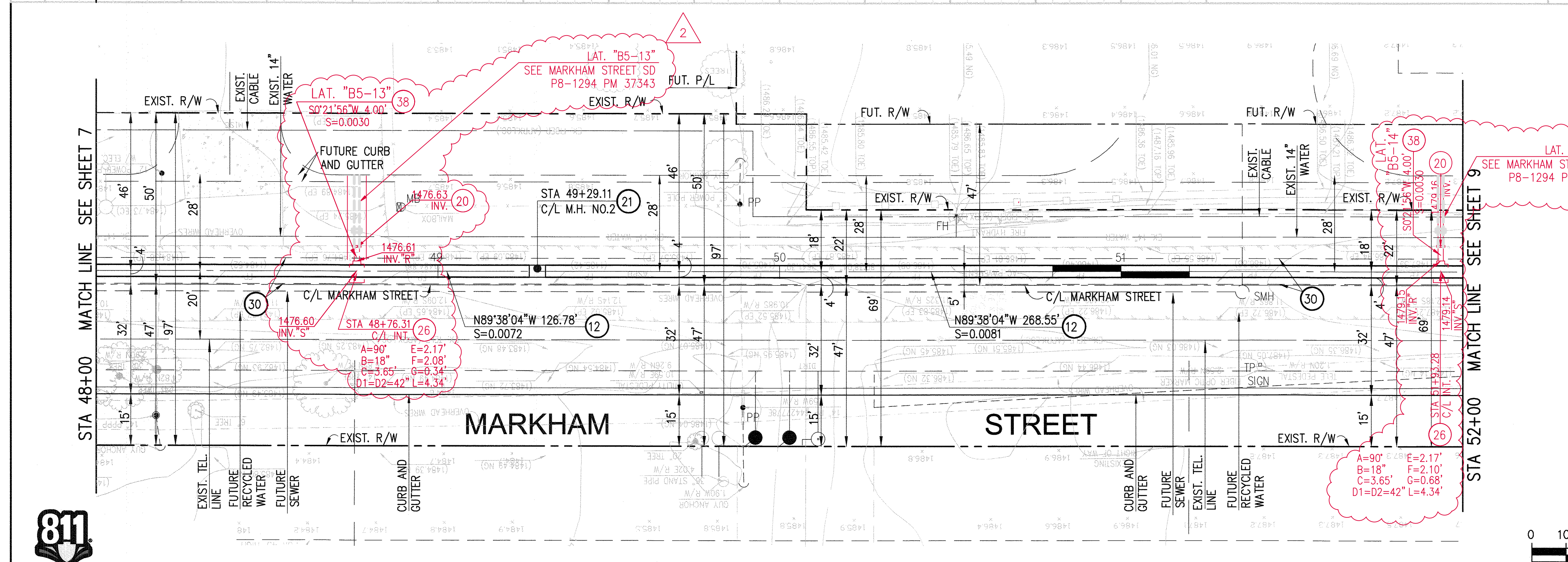
REVISIONS	ENGINEER	RCFC/
ADD QUANTITY, ADD S.D. STUB-OUT PER P8-1294 PM 37343 UPDATE Q100 & V100, SPT. 2, BRU TO & 15, REV. CONST. NO. 38 REVISE DIS. TO R. V. FOR LAT. B5-3 AND B5-4	HIA	9/04/18

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
 RECOMMENDED FOR APPROVAL BY: *[Signature]*
 DATE: 3/15/18
 APPROVED BY: *[Signature]*
 DATE: 3-22-2018

PERRIS VALLEY MDP
 LATERAL B-5
 STAGE 2
 PLAN AND PROFILE
 STA 44+00 TO STA 48+00
 PROJECT NO. 4-0-00461
 DRAWING NO. 4-1121
 SHEET NO. 7 OF 14



SECTION AT STA 51+00
SCALE: 1"=10'



STORM DRAIN CONSTRUCTION NOTES

- (12) CONSTRUCT 42" R.C.P. D-LOAD PER PROFILE
- (21) CONSTRUCT MANHOLE NO. 2 PER R.C.F.C.W.C.D. DRAWING NO. MH252
- (30) SAWCUT EXISTING A.C. PAVEMENT AND REPAIR TRENCH SURFACE PER CITY OF PERRIS, DETAILS ON SHEET 14

- (20) CONSTRUCT CONCRETE BULKHEAD PER R.C.F.C.W.C.D. DRAWING NO. M816
- (26) CONSTRUCT TRANSITION STRUCTURE PER R.C.F.C.W.C.D. DRAWING TS303
- (38) CONSTRUCT 18" R.C.P. CLASS IV STUB

RECORD DRAWINGS

APPROVED: *[Signature]*
DATE: 2/25/2020 PM 36678

Know what's below. Call before you dig.

BENCH MARK
COUNTY OF RIVERSIDE BENCHMARK NO. M-31"
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 #4 - 437' WEST OF CENTERLINE OF PERRIS BLVD.
AND 4.5 FT. EAST OF CONCRETE BRIDGE BARRIER. (EDGE
OF BRIDGE)
ELEVATION = 1474.874' (NVD) '20 / 1996 ADA)

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

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

DESIGNED BY:
EDT
DRAWN BY:
EDT
DATE DRAWN:

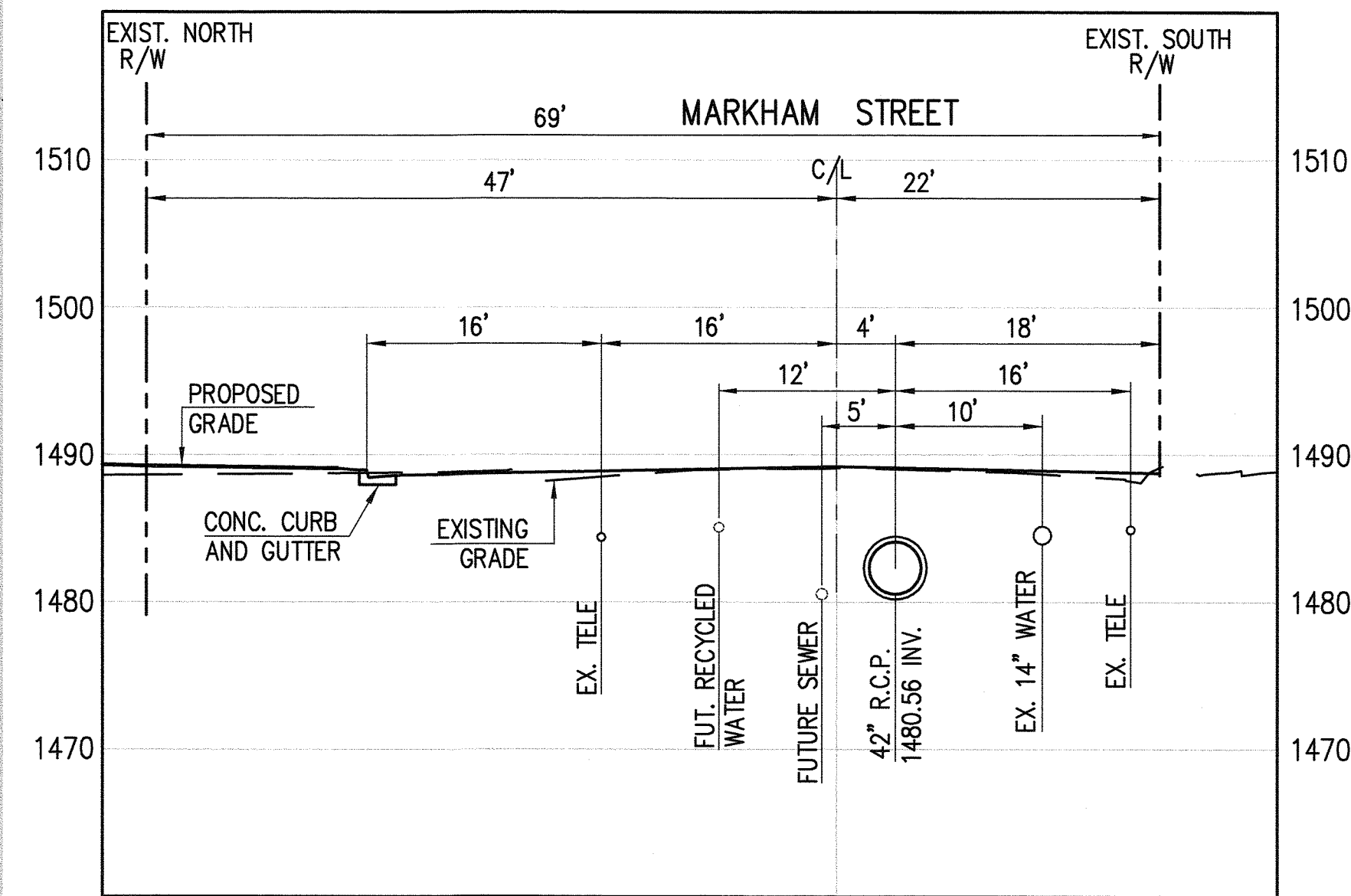
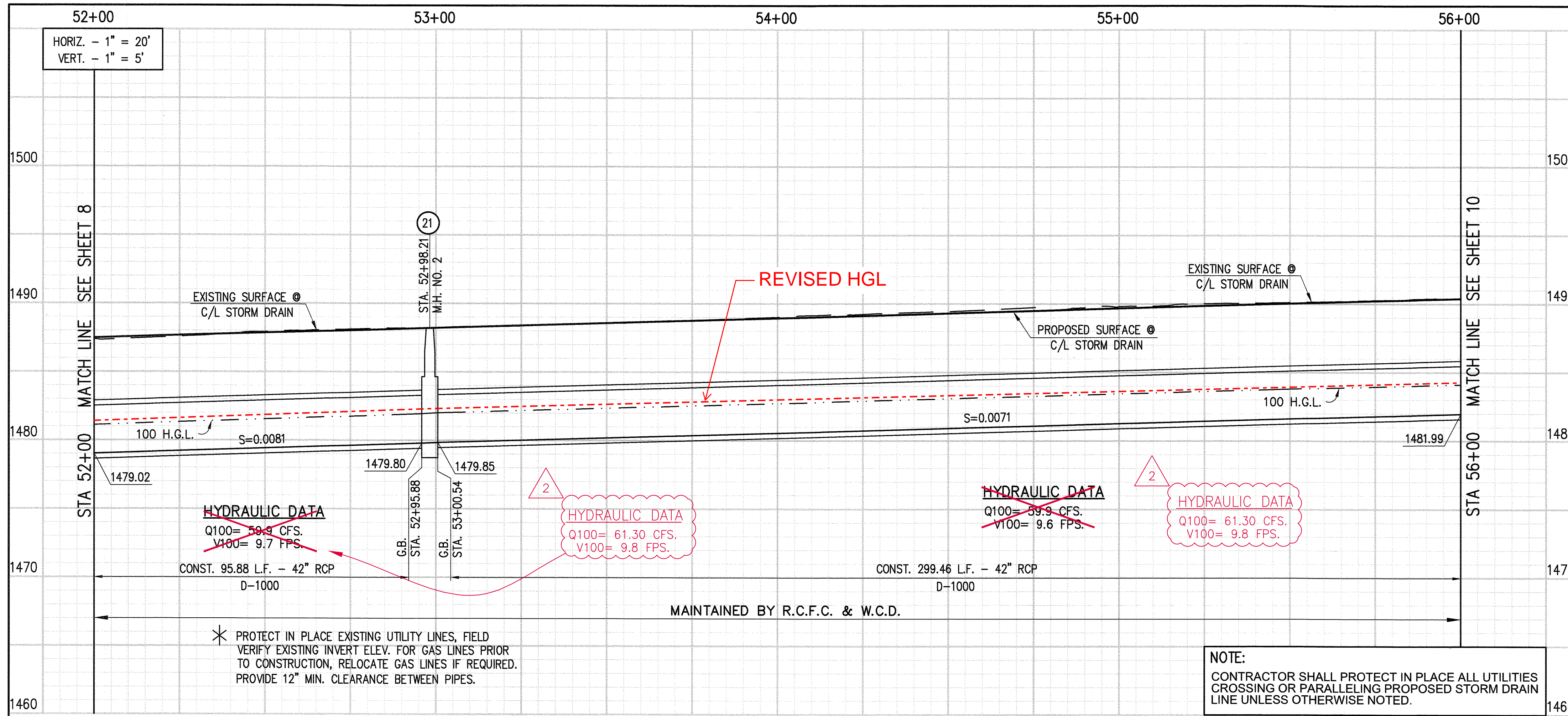
CITY OF PERRIS
CITY ENGINEER

REVISIONS	ENGINEER	RCFC/
ADD QUANTITY, ADD S.D. STUB-OUT PER P8-1294 PM 37343 UPDATE Q100 & V100, SHT. 2, FROM 10' & 13, REV. CONST. NO. 38 REVISE C/S, IC & V FOR LAT. B5-3 AND B5-4	HIA	9/04/18

RIVERSIDE COUNTY FLOOD CONTROL
AND
WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY:
[Signature]
DATE: 3/15/18

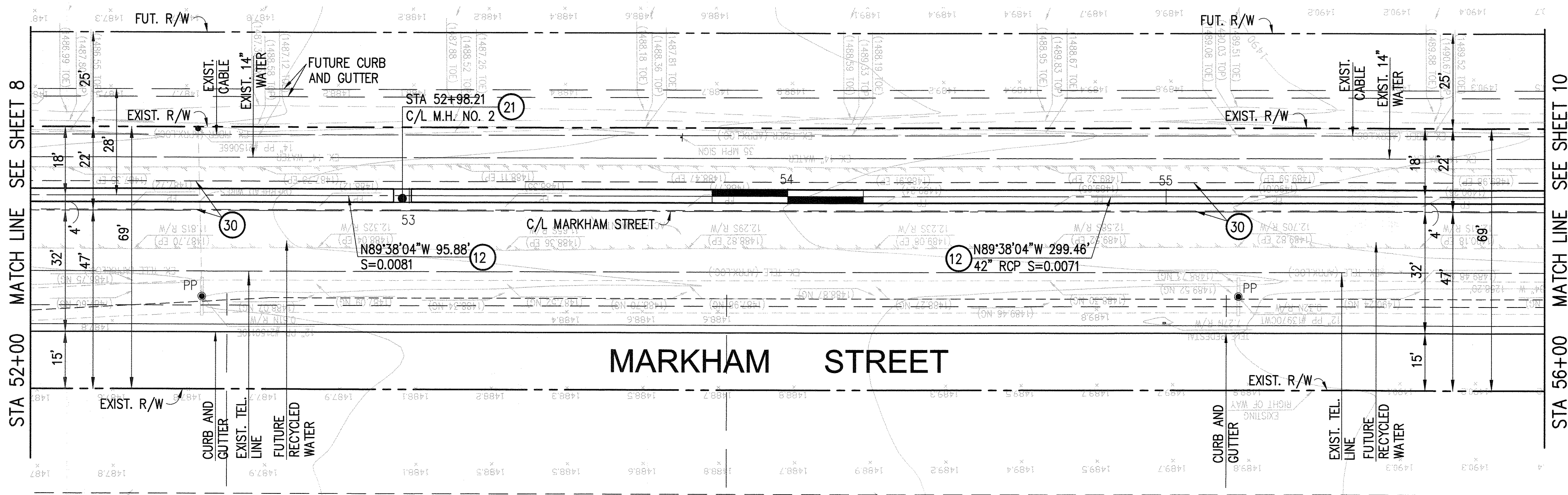
PERRIS VALLEY MDP
LATERAL B-5
STAGE 2
PLAN AND PROFILE
STA 48+00 TO STA 52+00

PROJECT NO.
4-0-00461
DRAWING NO.
4-1121
SHEET NO.
8 OF 14



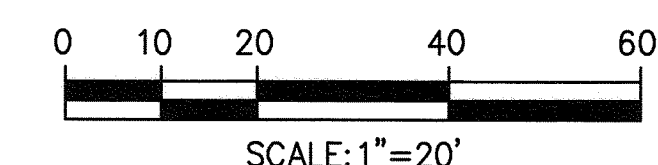
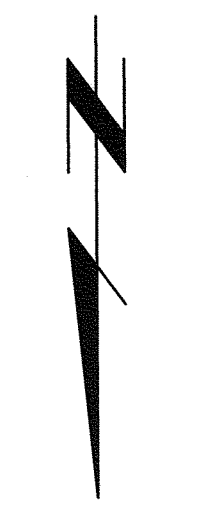
SECTION AT STA 54+00
SCALE: 1"=10'

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

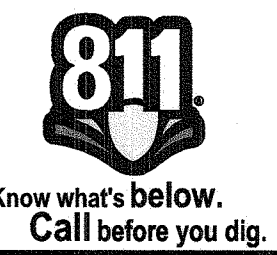


STORM DRAIN CONSTRUCTION NOTES

- (12) CONSTRUCT 42" R.C.P. D-LOAD PER PROFILE
- (21) CONSTRUCT MANHOLE NO. 2 PER R.C.F.C.W.C.D. DRAWING NO. MH252
- (30) SAWCUT EXISTING A.C. PAVEMENT AND REPAIR TRENCH SURFACE PER CITY OF PERRIS, DETAILS ON SHEET 14

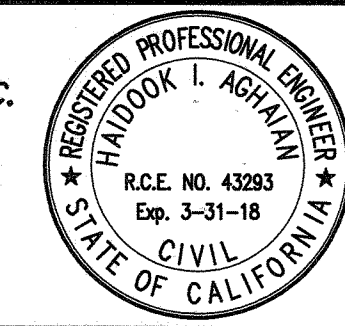


RECORD DRAWINGS
APPROVED: *[Signature]*
DATE: 2/25/2020



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 IF CURB LOCATED AT THE CROSSING OF PERRIS BLVD. AND RIV. CO. FLOOD CONTROL CHANNEL (PERRIS LATERAL 14.43 FT. WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE BARRIER, EDGE OF BRIDGE)
ELEVATION = 1474.674' (NAD83 / 1988 ADA)

APPROVED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING - LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH: (714) 521-4811 FAX: (714) 521-4173
[Signature] Date: 1/25/18
HAIDOOK AGHAIAN RCE NO. 43293



DESIGNED BY:
EDT
DRAWN BY:
EDT
DATE DRAWN:

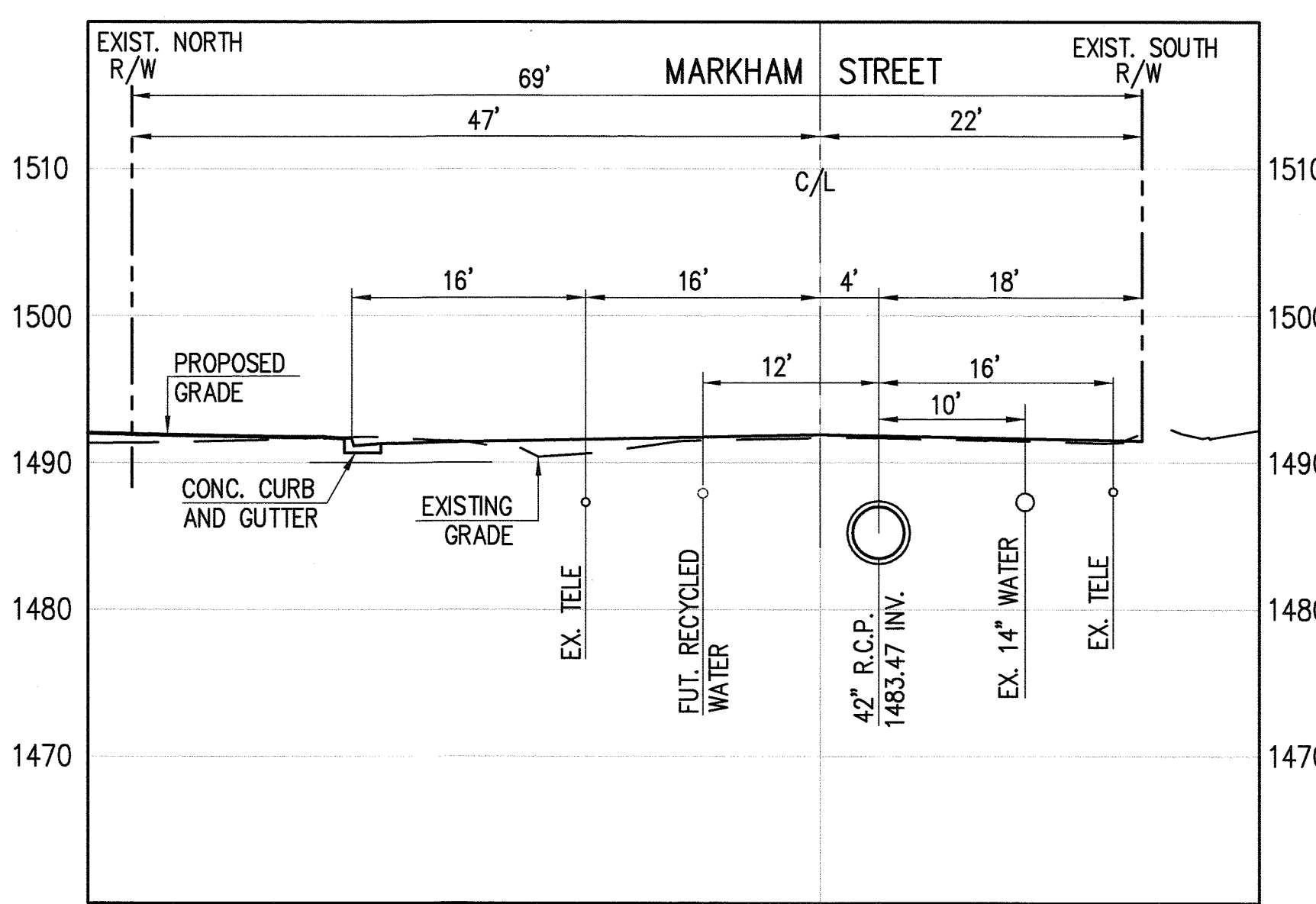
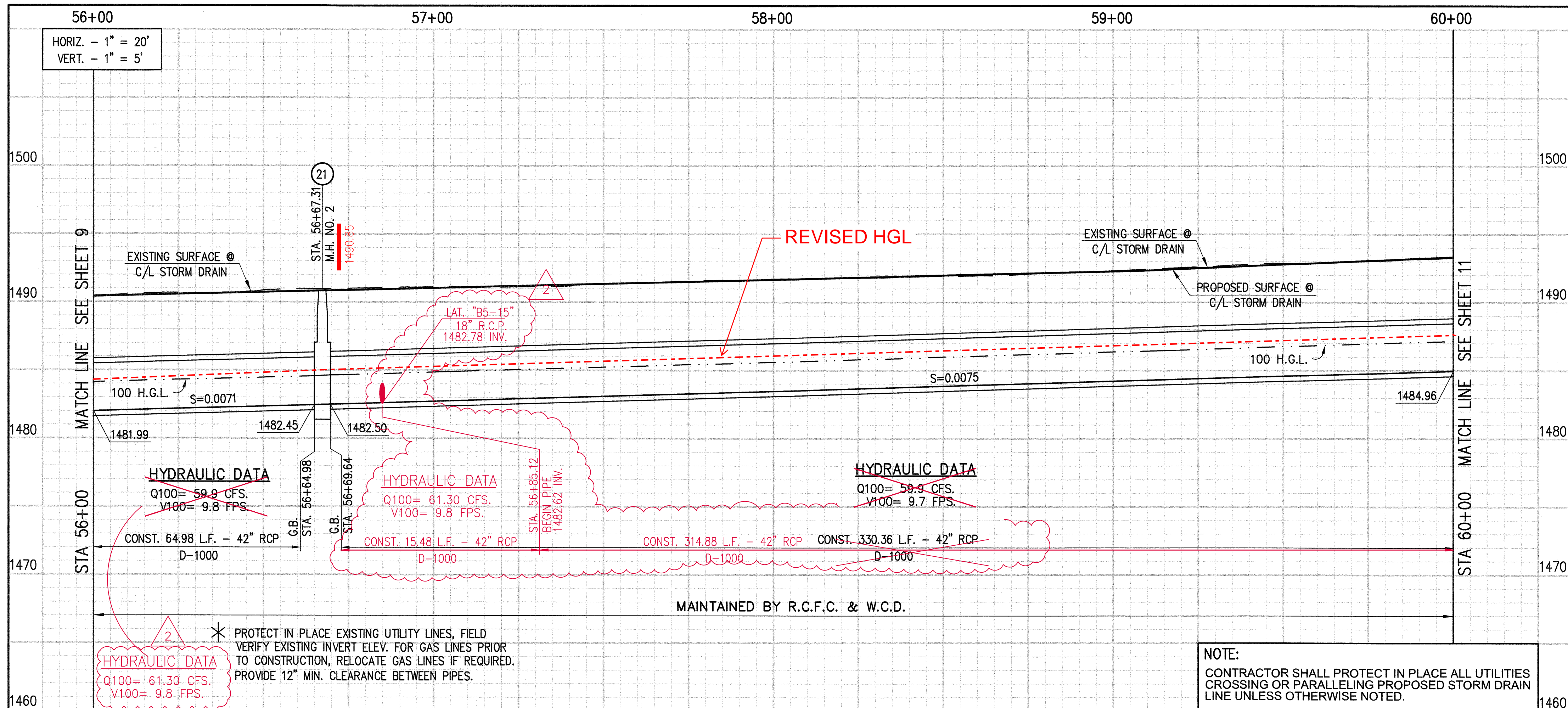
CITY OF PERRIS
CITY ENGINEER DATE

REVISIONS	ENGINEER	RCFC/
ADD QUANTITY, ADD S.D. SUB-OFF PER P8-1294 PM 37343 UPDATE Q100 & V100, SHI 2 PER 10 & 13, REV. CONST. NO. 38 REVISE CBS TO 8 & 9 FOR LAT. 95-3 AND 95-4	HIA	9/04/18

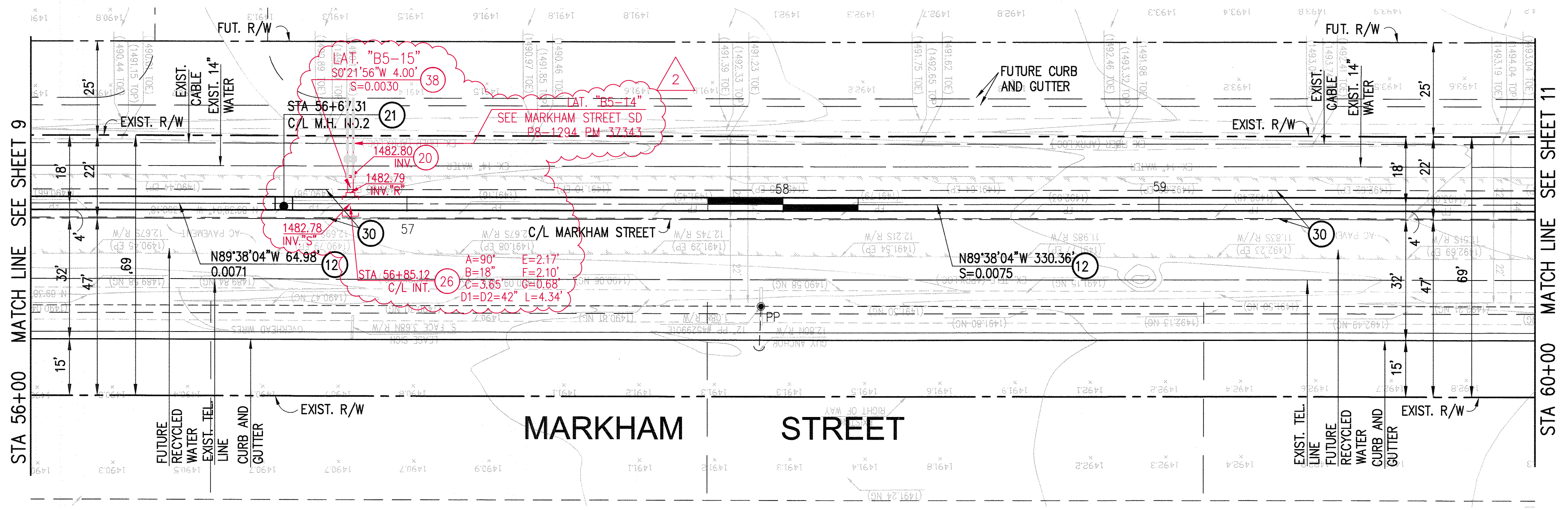
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: *[Signature]*
APPROVED BY: *[Signature]*
DATE: 3/15/18 DATE: 3-22-2018

PERRIS VALLEY MDP
LATERAL B-5
STAGE 2
PLAN AND PROFILE
STA 52+00 TO STA 56+00

PROJECT NO.
4-0-00461
DRAWING NO.
4-1121
SHEET NO.
9 OF 14



SECTION AT STA 58+00
SCALE: 1"=10'



STORM DRAIN CONSTRUCTION NOTES

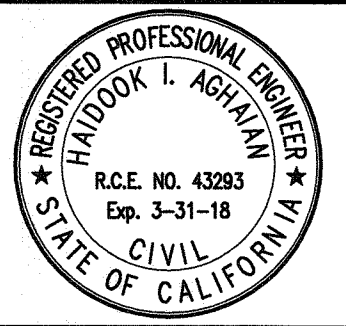
- (12) CONSTRUCT 42" R.C.P. D-LOAD PER PROFILE
- (21) CONSTRUCT MANHOLE NO. 2 PER R.C.F.C.W.C.D. DRAWING NO. MH252
- (30) SAWCUT EXISTING A.C. PAVEMENT AND REPAIR TRENCH SURFACE PER CITY OF PERRIS, DETAILS ON SHEET 14

- (2) (20) CONSTRUCT CONCRETE BULKHEAD PER R.C.F.C.W.C.D. DRAWING NO. M816
- (2) (26) CONSTRUCT TRANSITION STRUCTURE PER R.C.F.C.W.C.D. DRAWING TS303
- (2) (38) CONSTRUCT 18" R.C.P. CLASS IV STUB



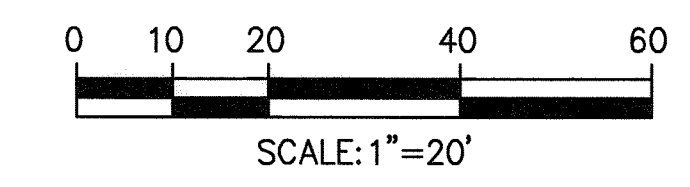
BENCH MARK
COUNTY OF RIVERSIDE
BENCHMARK NO. "M-31"
COUNTY OF RIVERSIDE BENCHMARK - 3 1/4" ALUMINUM DISK MARKED "M-31" LOCATED FLUSH AT THE SOUTH WEST CORNER OF BRIDGE ON TOP OF SIDEWALK NEAR FACE IF CURB LOCATED AT THE CROSSING OF PERRIS BLVD. AND RIV. CO. FLOOD CONTROL CHANNEL (PERRIS LATERAL 24" ASP. WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE BARRIER. EDGE OF BRIDGE)
ELEVATION = 1474.674' (NVD) 29 / 1896 ADA)

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: 1/25/18
RCE NO. 43293
HAIDOOK AGHAJAN



DESIGNED BY: EDT
DRAWN BY: EDT
DATE DRAWN:
CITY OF PERRIS
CITY ENGINEER

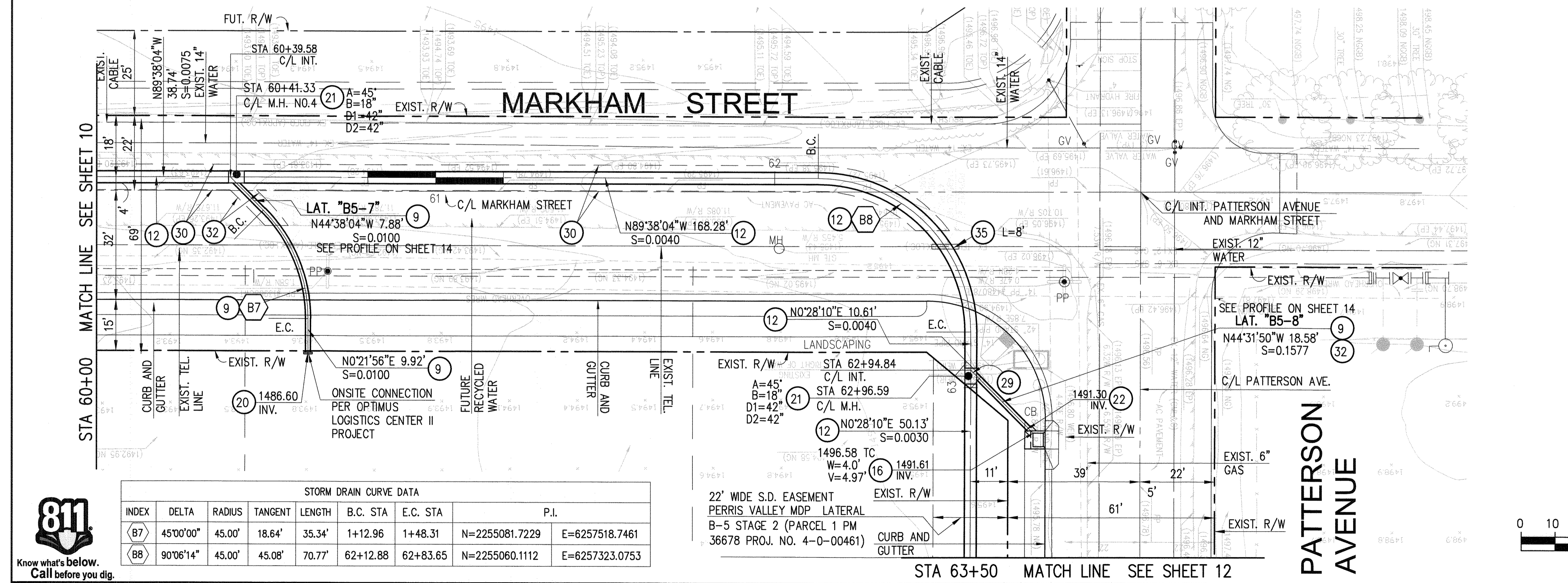
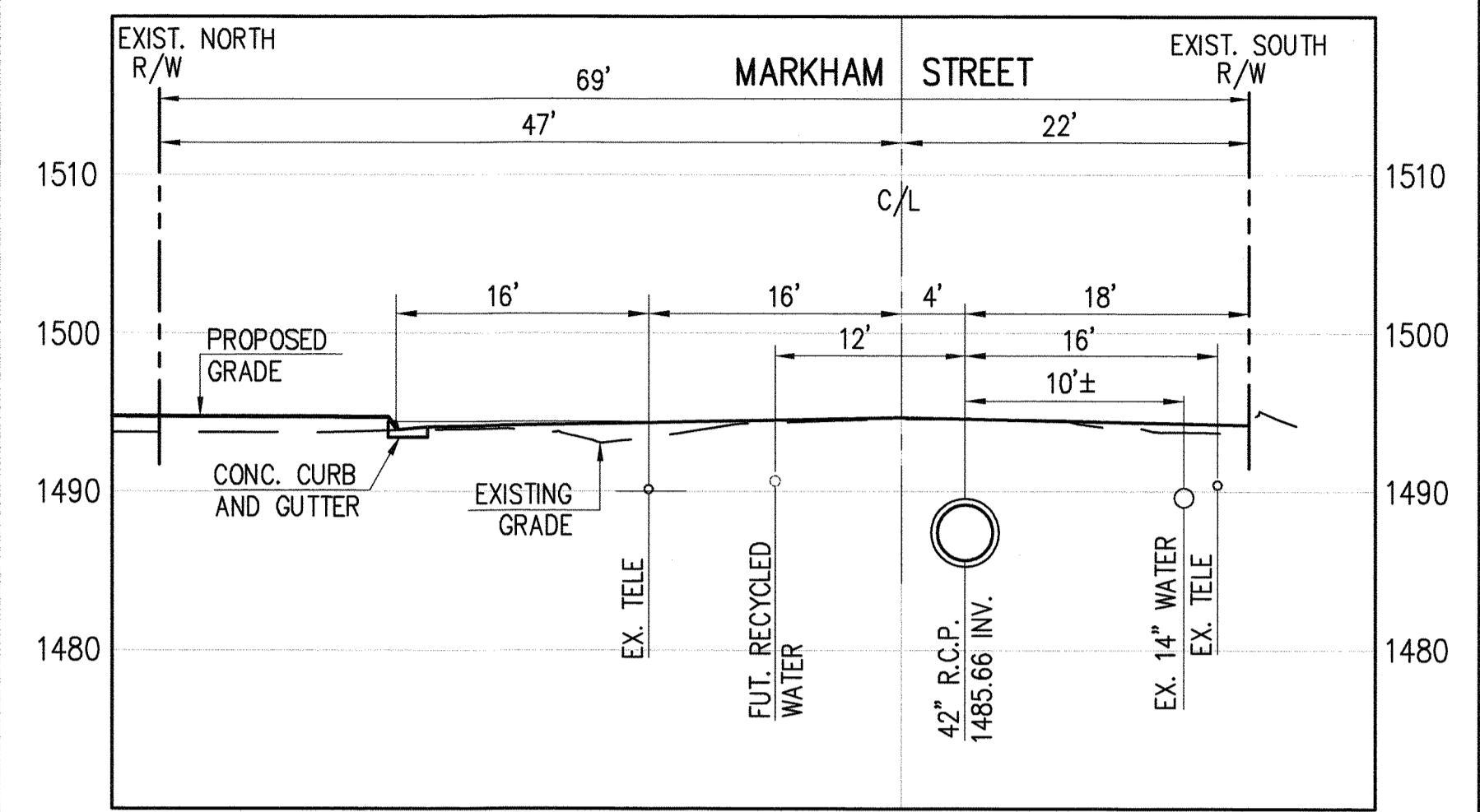
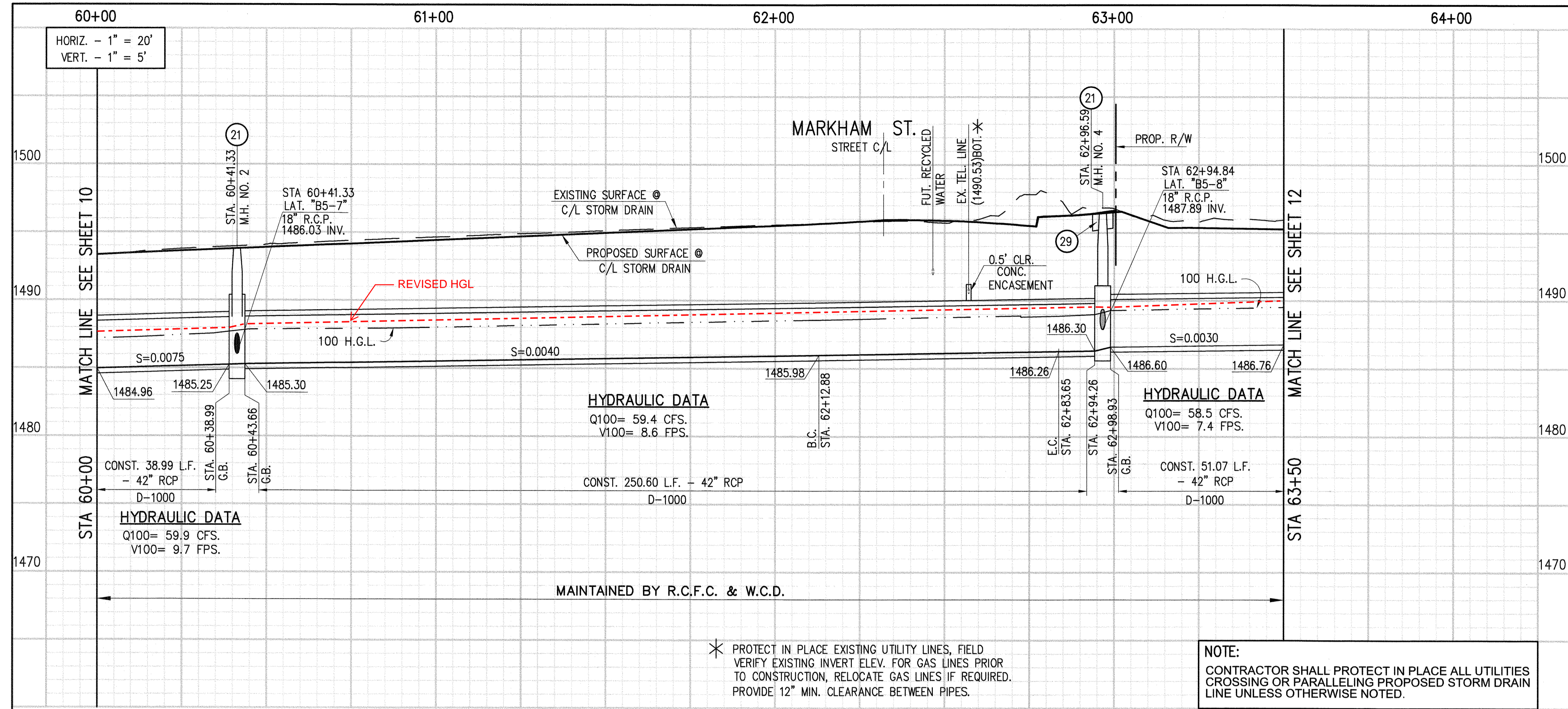
RECORD DRAWINGS
APPROVED: *[Signature]*
DATE: 2/25/2020



REVISIONS	ENGINEER	RCFC/
ADD QUANTITY, ADD S.D. SUB-OUT PER P8-1294 PM 37343 UPDATE Q100 & V100, SHL 2, THRU TO & 1.5, REV. CONST. NO. 38 REVISE PERS. TO R. V. FIVE L.A.T. PER L AND PER 4	HIA	9/04/18 <i>[Signature]</i>

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: *[Signature]*
DATE: 3/15/18
APPROVED BY: *[Signature]*
DATE: 3-22-2018

PERRIS VALLEY MDP LATERAL B-5 STAGE 2 PLAN AND PROFILE STA 56+00 TO STA 60+00
PROJECT NO. 4-0-00461
DRAWING NO. 4-1121
SHEET NO. 10 OF 14



STORM DRAIN CONSTRUCTION NOTES

- 9 - CONSTRUCT 18" R.C.P. CLASS IV PER PROFILE
- 12 - CONSTRUCT 42" R.C.P. D-LOAD PER PROFILE
- 16 - CONSTRUCT CURB INLET CATCH BASIN PER COUNTY OF RIVERSIDE STD DRAWING NO. 300. ("W" PER PLAN).
- 20 - CONSTRUCT CONCRETE BULKHEAD PER R.C.F.C.W.C.D. DRAWING NO. M816
- 21 - CONSTRUCT MANHOLE NO. 2 PER R.C.F.C.W.C.D. DRAWING NO. MH252
- 22 - CONSTRUCT SPECIAL CONNECTION TO CATCH BASIN PER R.C.F.C.W.C.D. DRAWING NO. CB109
- 29 - CONSTRUCT 6"x6"-6" THICK CONCRETE PAD AROUND MANHOLE WITH #4 BARS @ 18" O.C. EACH WAY
- 30 - SAWCUT EXISTING A.C. PAVEMENT AND REPAIR TRENCH SURFACE PER CITY OF PERRIS, DETAILS ON SHEET 14
- 32 - SAWCUT EXISTING A.C. PAVEMENT AND CONSTRUCT PIPE TRENCH (WHERE IT OCCURS) PER CITY OF PERRIS CITY STANDARD UTILITY TRENCH SURFACE REPAIR (PIPES TO BE MAINTAINED BY CITY OF PERRIS)
- 35 - CONSTRUCT CONCRETE ENCASUREMENT PER R.C.F.C.W.C.D. DRAWING NO. M808 LENGTH OF ENCASUREMENT "L" PER PLAN

STORM DRAIN CURVE DATA

INDEX	DELTA	RADIUS	TANGENT	LENGTH	B.C. STA	E.C. STA	P.I.
B7	45°00'00"	45.00'	18.64'	35.34'	1+12.96	1+48.31	N=2255081.7229 E=6257518.7461
B8	90°06'14"	45.00'	45.08'	70.77'	62+12.88	62+83.65	N=2255060.1112 E=6257323.0753



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 IF CURB LOCATED AT THE CROSSING OF PERRIS BLVD. AND RIV. CO. FLOOD CONTROL CHANNEL (PERRIS) LATERAL 14.4' WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5' FT. EAST OF CONCRETE BRIDGE BARRIER (EDGE OF BRIDGE)
ELEVATION = 1474.674' (MVD 29 / 1898 ADL)

APPROVED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING - LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH: (714) 921-4911 FAX: (714) 921-4173
Date: 1/25/18
HAIDOOK AGHAIAN RCE NO. 43293

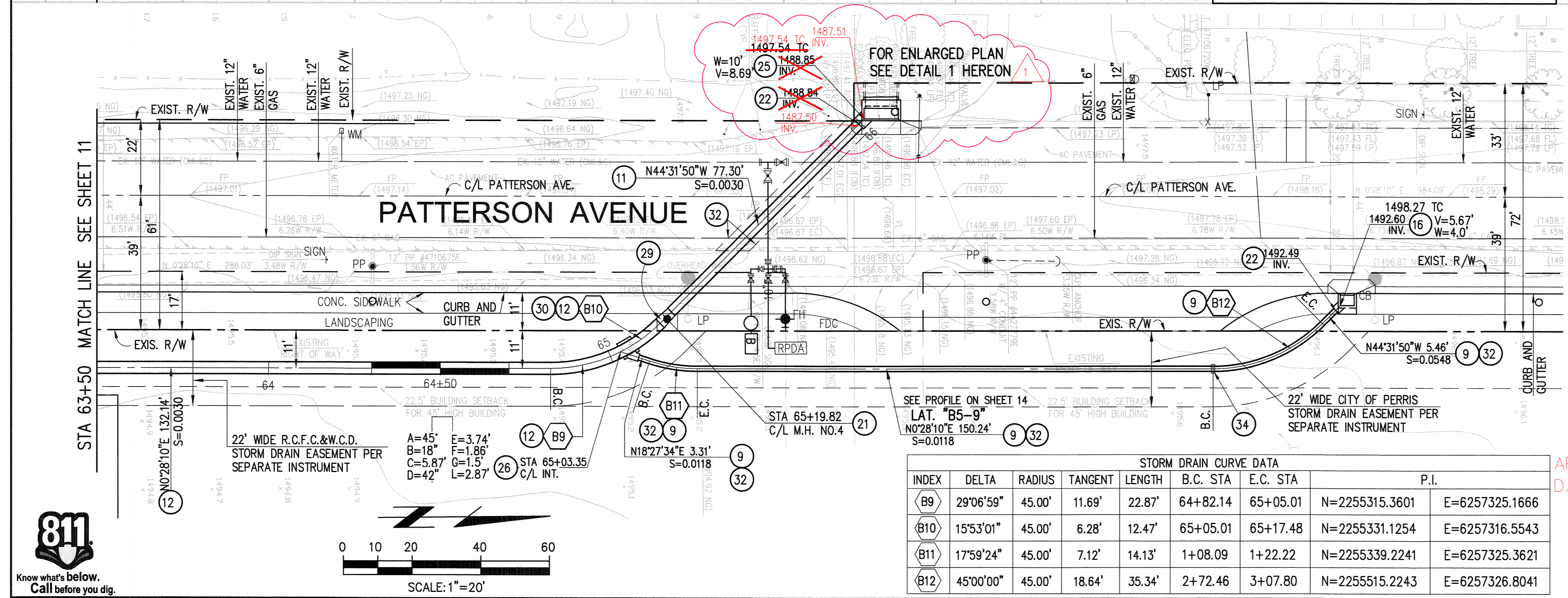
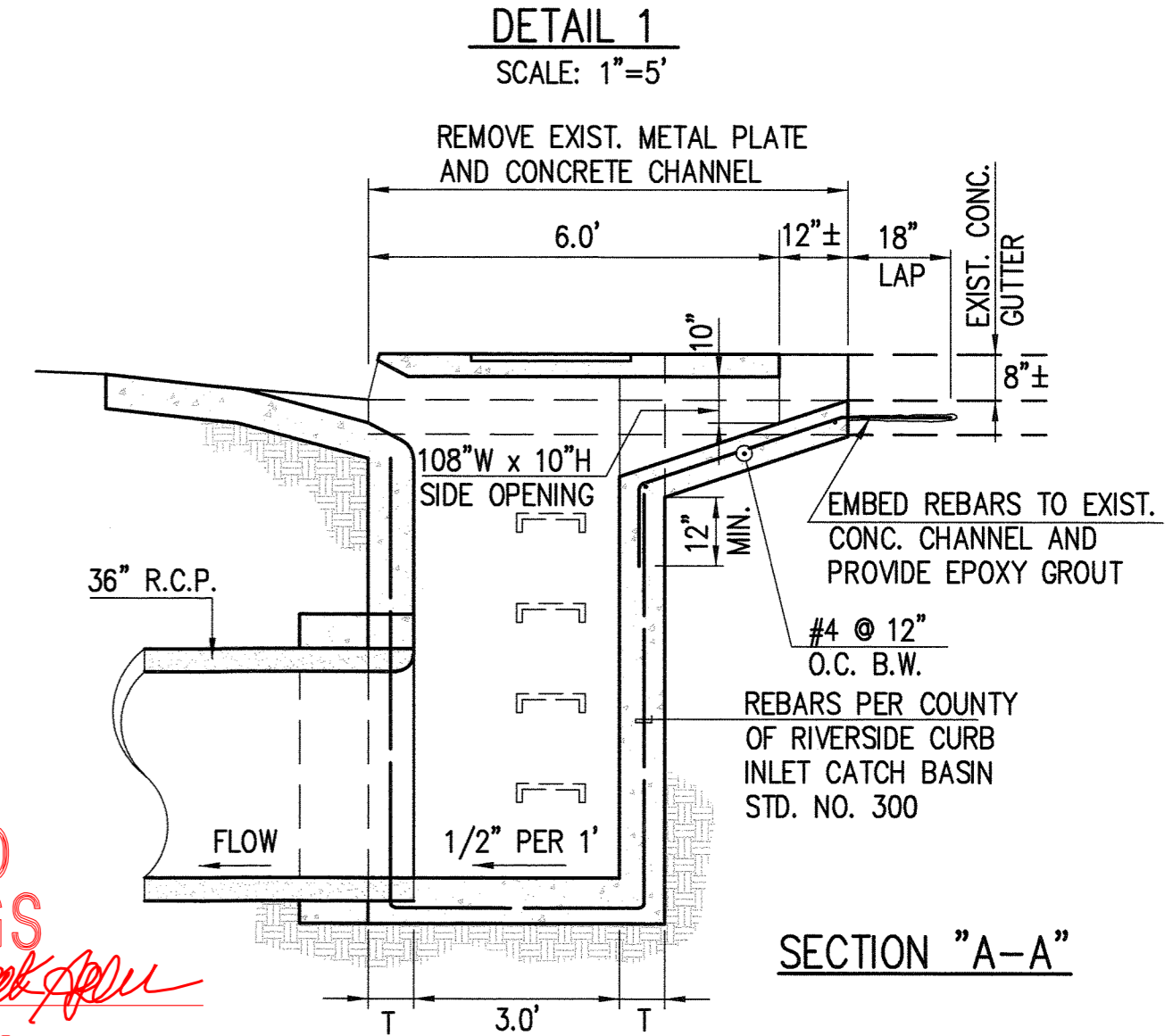
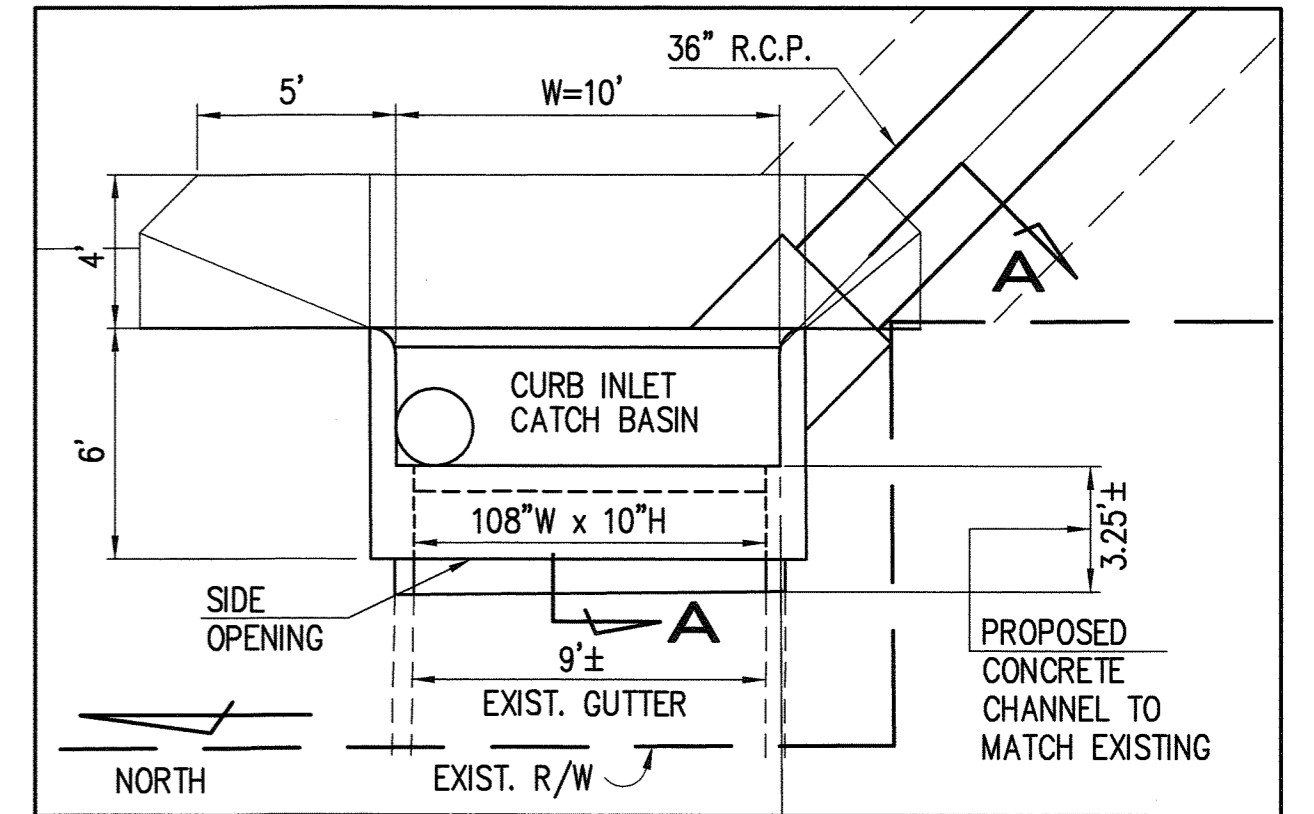
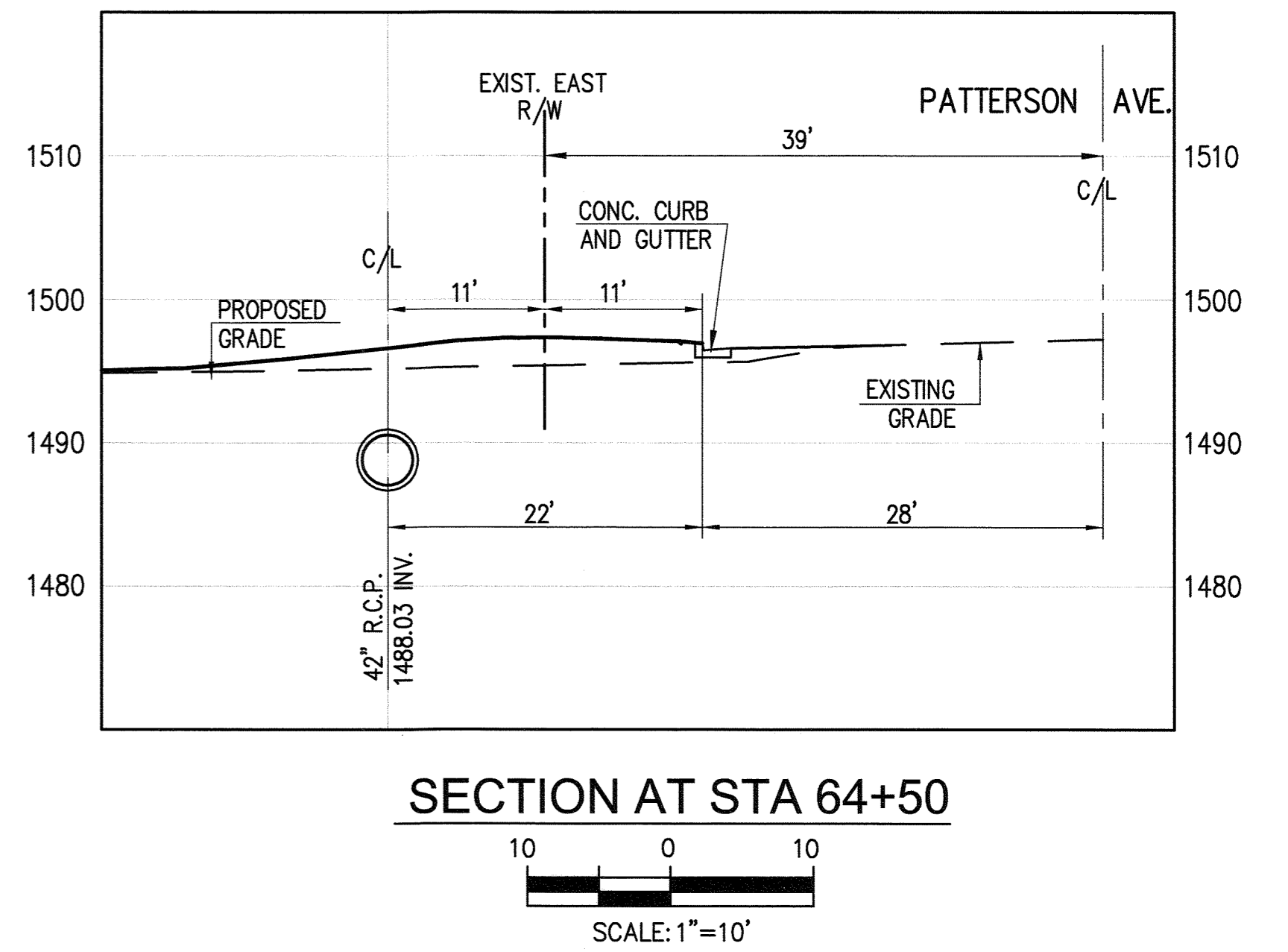
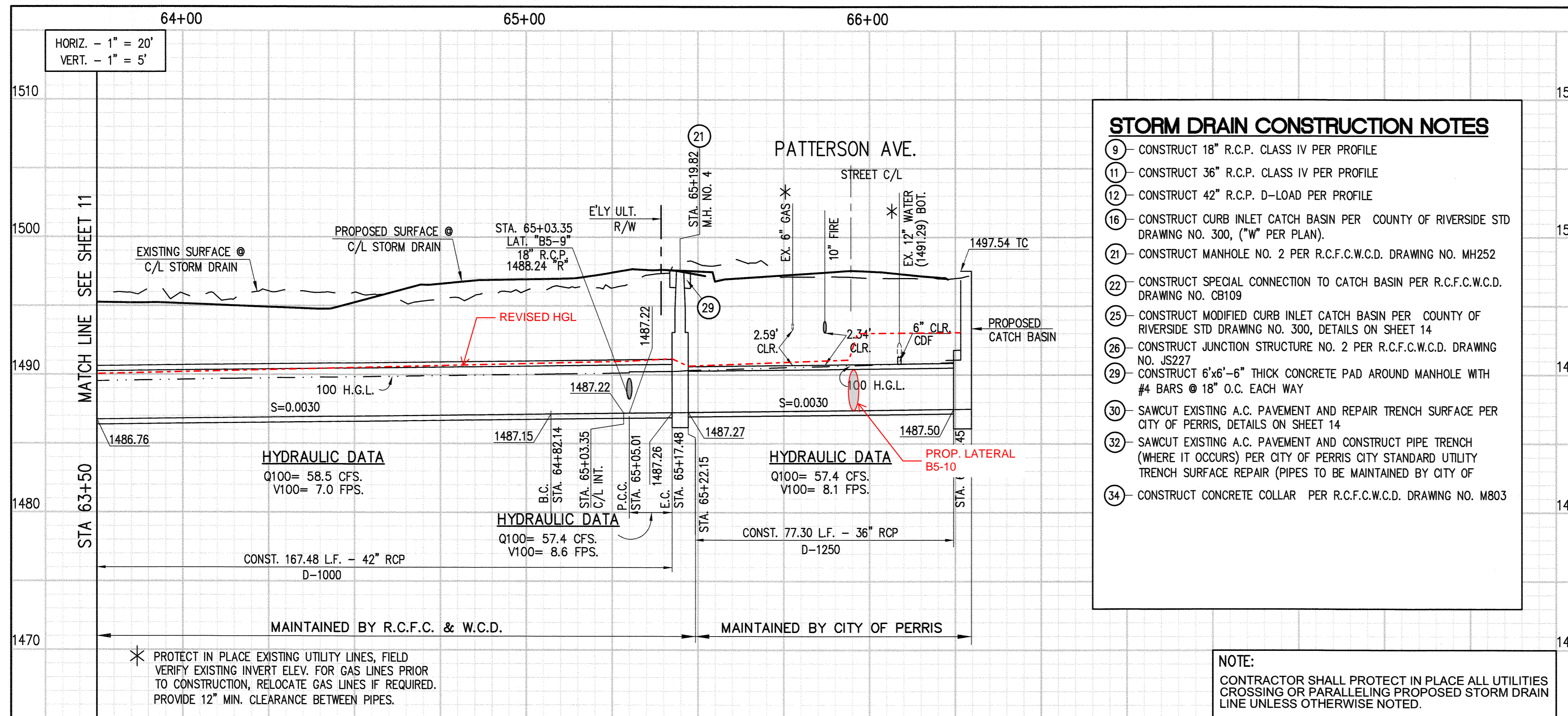
DESIGNED BY: EDT
DRAWN BY: EDT
DATE DRAWN: 2/9/18
CITY ENGINEER DATE

CITY OF PERRIS

REVISIONS	ENGINEER	RCFC/

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: Deborah de Chambray
APPROVED BY: Stewart E. K. K. K.
DATE: 3/15/18 DATE: 3-22-2018

PERRIS VALLEY MDP LATERAL B-5 STAGE 2 PLAN AND PROFILE STA 60+00 TO STA 63+50
PROJECT NO. 4-0-00461
DRAWING NO. 4-1121
SHEET NO. 11 OF 14



811
Know what's below. Call 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 IF CURB LOCATED AT THE CROSSING OF PERRIS BLVD. AND RIV. CO. FLOOD CONTROL CHANNEL (PERRIS LATERAL 21' EAST WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE BARRIER (EDGE OF BRIDGE)
ELEVATION = 1474.674' (NGVD '29 / 1896 ADL)

APPROVED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING - LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH: (714) 921-4111 FAX: (714) 921-4173
Haidook Aghaian Date: 1/25/18 RCE NO. 43293

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

DESIGNED BY: EDT
DRAWN BY: EDT
DATE DRAWN: 2/1/18
CITY OF PERRIS
CITY ENGINEER

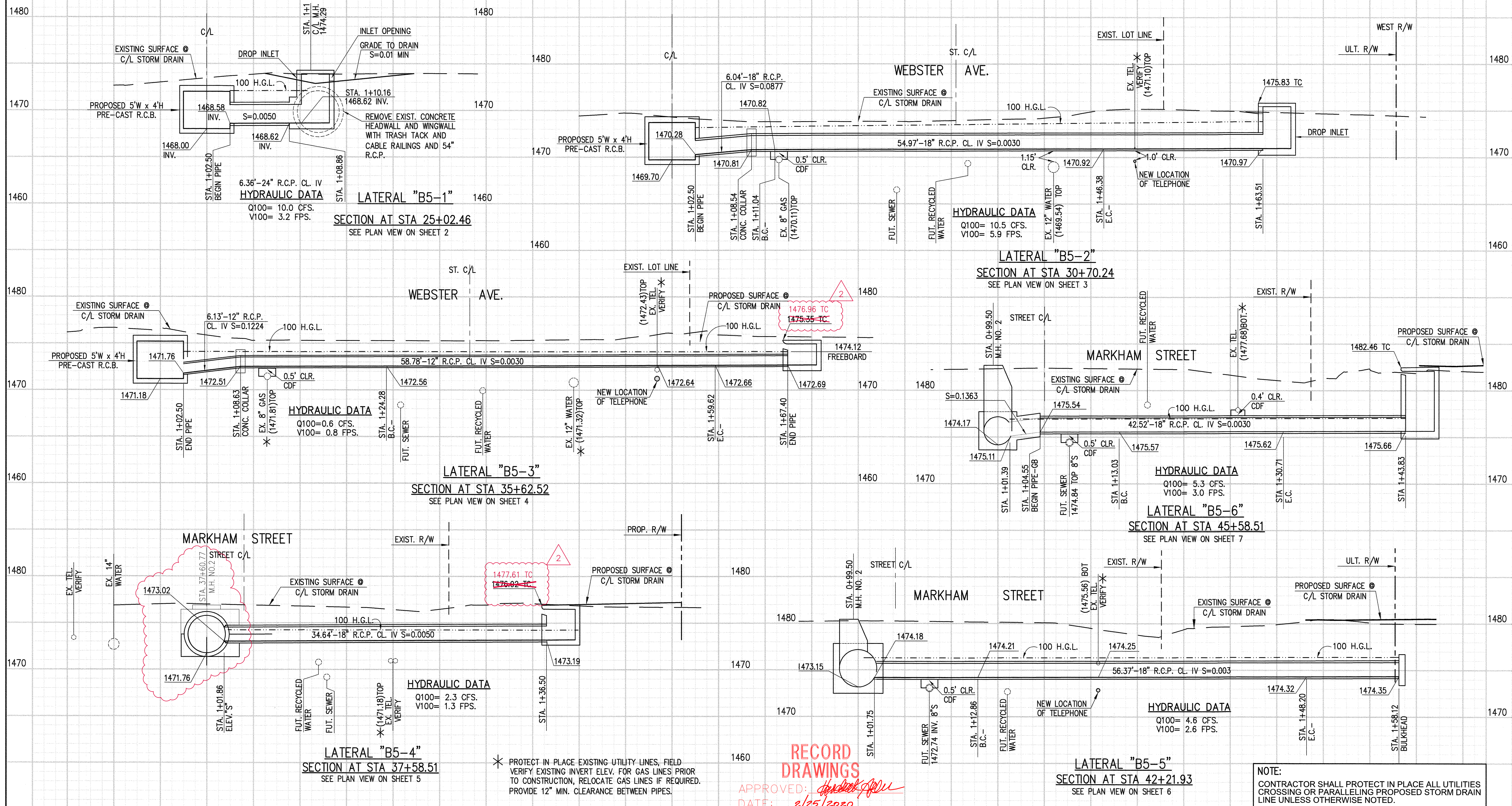
REF.	DESCRIPTION	APPR.	DATE	APPR.	DATE
1	MODIFY CATCH BASIN CONST #25 @ STA. 66+03	HIA	7/2/18	JL	2/15/18

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
RECOMMENDED FOR APPROVAL BY: *Subrah Chatterjee*
DATE: 3/15/18
APPROVED BY: *Shant E. T. K.*
DATE: 3-22-2018

MODIFIED COUNTY OF RIVERSIDE CURB INLET CATCH BASIN STD. NO. 300
MODIFIED CATCH BASIN DETAILS 25
N.T.S.
P8/228408 PM 36678
CITY OF PERRIS FILE NO. P8-1237
PROJECT NO. 4-0-00461
DRAWING NO. 4-1121
SHEET NO. 12 OF 14

RECORD DRAWINGS
APPROVED: *[Signature]*
DATE: 2/25/2020

HORIZ. - 1" = 5'
VERT. - 1" = 5'

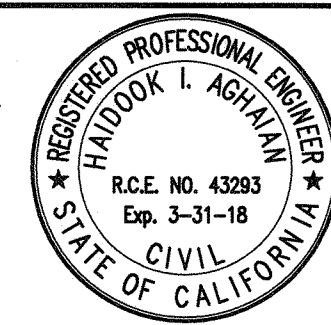


RECORD DRAWINGS
APPROVED: [Signature]
DATE: 2/25/2020

CONNECTOR PIPE PROFILES

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) 14' WEST OF CENTERLINE OF PERRIS BLVD. AND 4.3 FT. EAST OF CONCRETE BRIDGE BARRIER (EDGE OF BRIDGE)
ELEVATION = 1474.674' (NOV 29 / 1996 ADJ.)

APPROVED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING - LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH: (714) 921-4811 FAX: (714) 921-4173
Date: 1/25/18
HAIDOOK AGHAIAN RCE NO. 43293



DESIGNED BY:
EDT
DRAWN BY:
EDT
DATE DRAWN:

CITY OF PERRIS
[Signature]
CITY ENGINEER
DATE: 2/19/18

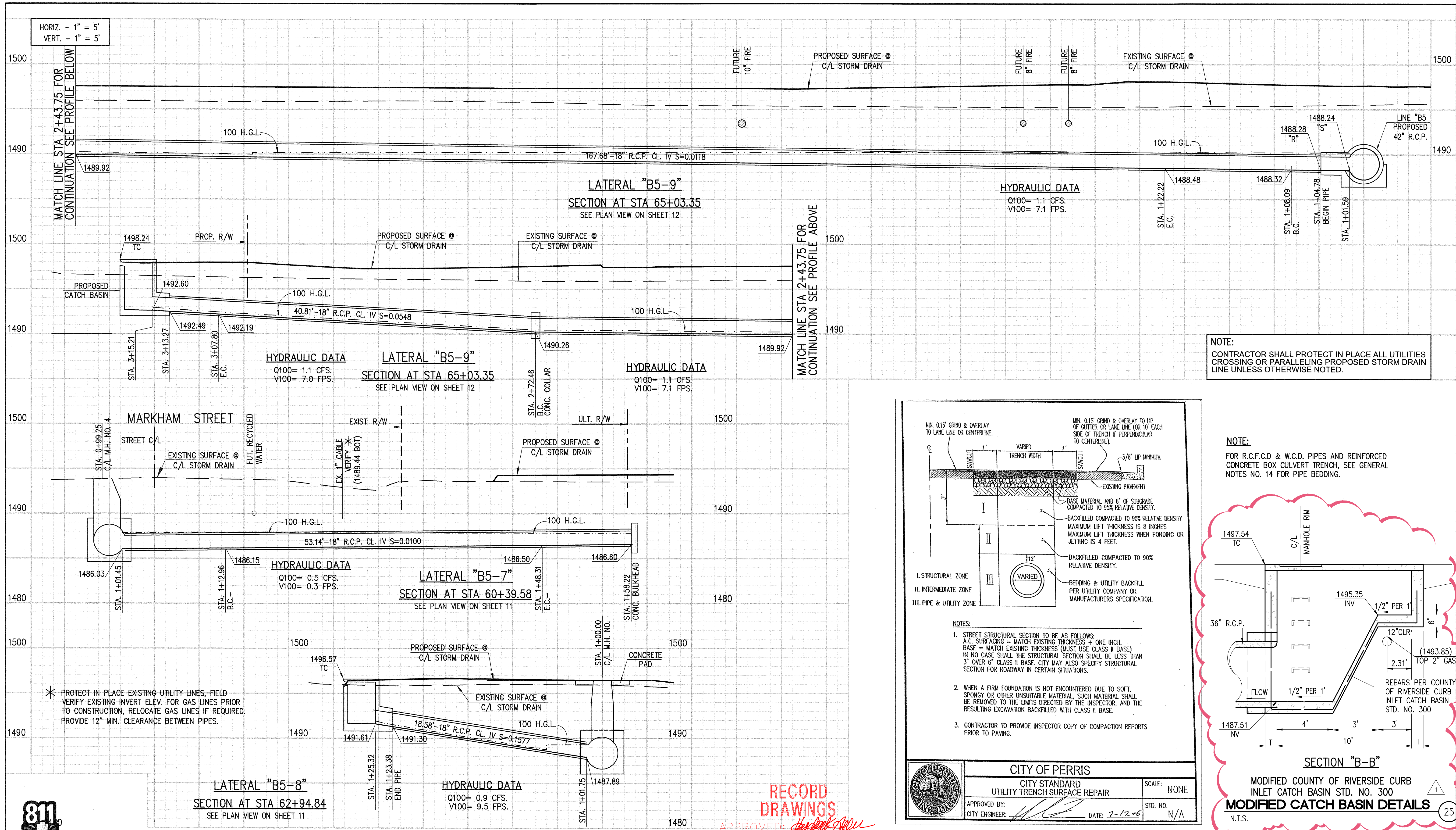
REVISIONS	ENGINEER	RCFC/
ADD QUANTITY, ADD S.D. STUB-OUT PER PB-1294 PM 37343	HIA	9/04/18
UPDATE Q100 & V100, SH-1, 2, 1680-19 & 13, REV. CONST. NO. 38		
REVISE CBS TO 2 & 4 FOR LAT. B5-3 AND B5-4		

REF.	DESCRIPTION	APPR.	DATE	APPR.	DATE

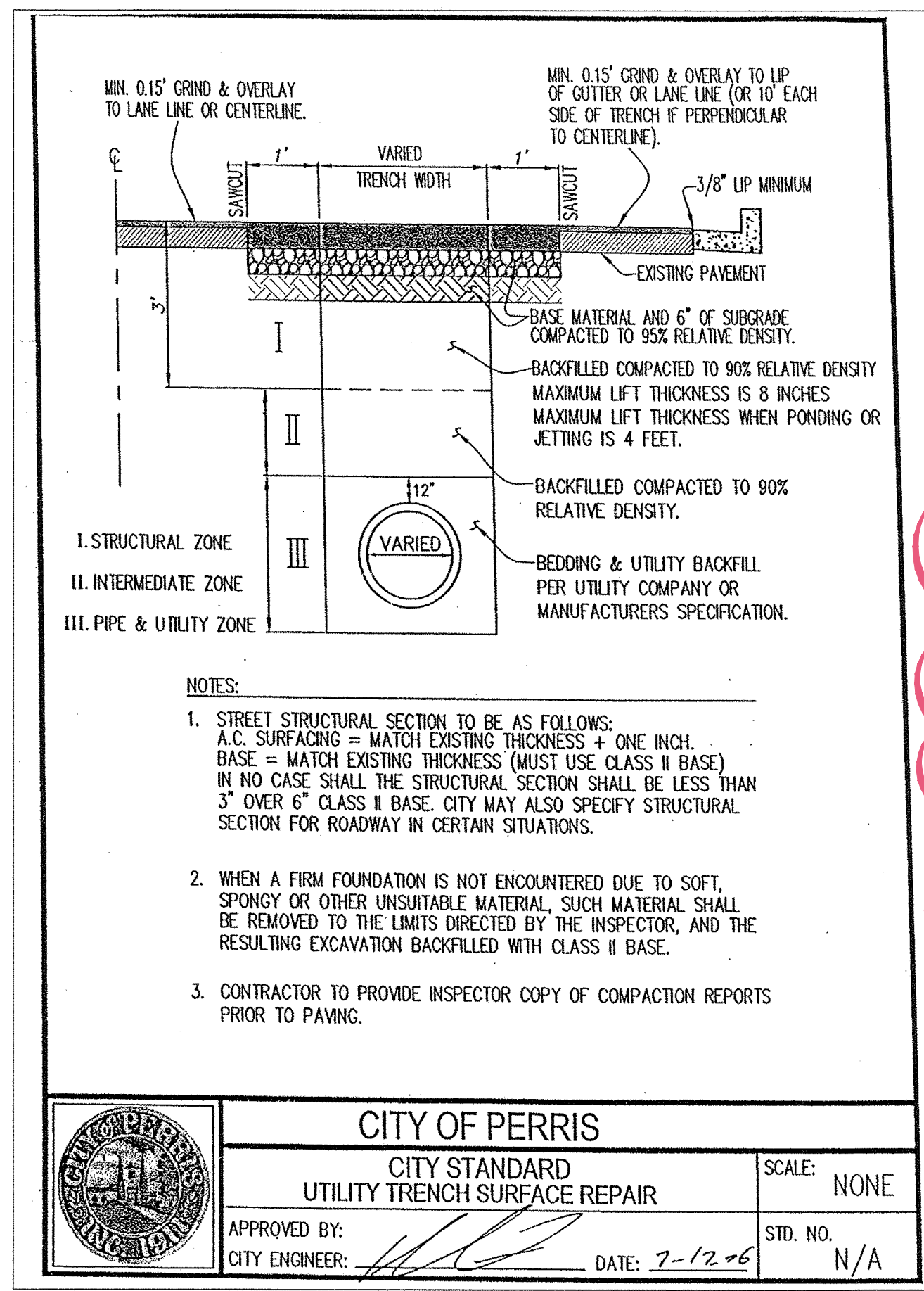
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CITY OF PERRIS FILE NO. P8-1237
KPL 2/26/2018

PERRIS VALLEY MDP
LATERAL B-5
STAGE 2
CONNECTOR PIPE PROFILES

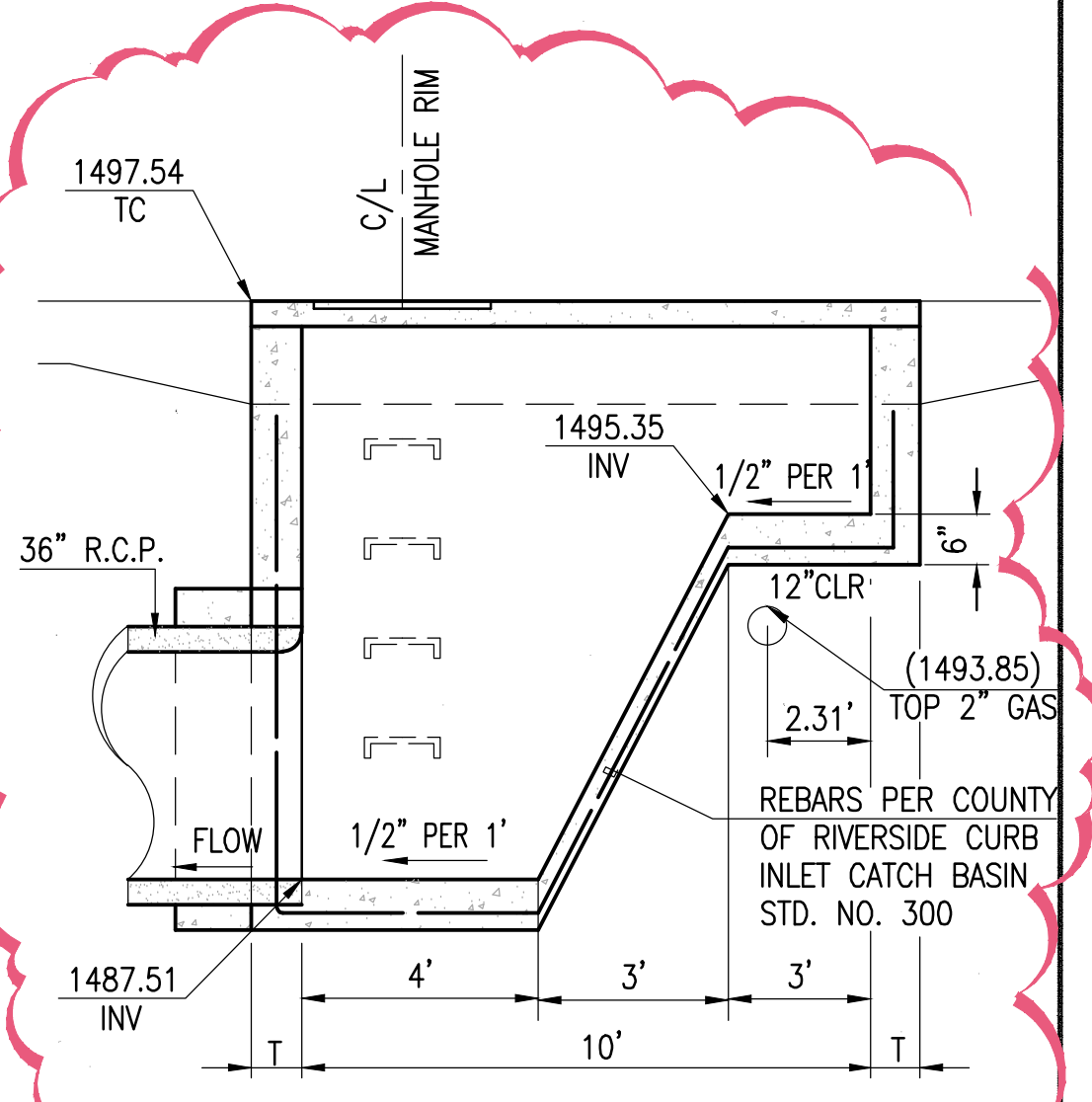
PROJECT NO.
4-0-00461
DRAWING NO.
4-1121
SHEET NO.
13 OF 14



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



NOTE:
FOR R.C.F.C.D & W.C.D. PIPES AND REINFORCED CONCRETE BOX CULVERT TRENCH, SEE GENERAL NOTES NO. 14 FOR PIPE BEDDING.



SECTION "B-B"
MODIFIED COUNTY OF RIVERSIDE CURB INLET CATCH BASIN STD. NO. 300
MODIFIED CATCH BASIN DETAILS
N.T.S.

RECORD DRAWINGS
APPROVED: *[Signature]*
DATE: 2/25/2020



BENCH MARK
COUNTY OF RIVERSIDE
BENCHMARK NO. "M-31"
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 24' WEST OF CENTERLINE OF PERRIS BLVD. AND 4.5 FT. EAST OF CONCRETE BRIDGE BARRIER (EDGE OF BRIDGE)
ELEVATION = 1474.67' (NCHD '20 / 1896 ADL)

APPROVED BY:
Thienes Engineering, Inc.
CIVIL ENGINEERING - LAND SURVEYING
14349 FIRESTONE BOULEVARD
LA MIRADA, CALIFORNIA 90638
PH: (714) 521-4811 FAX: (714) 521-4173
[Signature] Date: 1/25/18
HAIDOOK AGHAJAN RCE NO. 43293

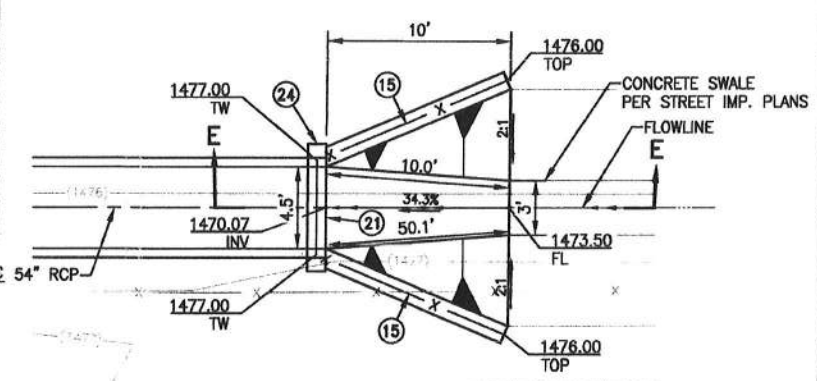
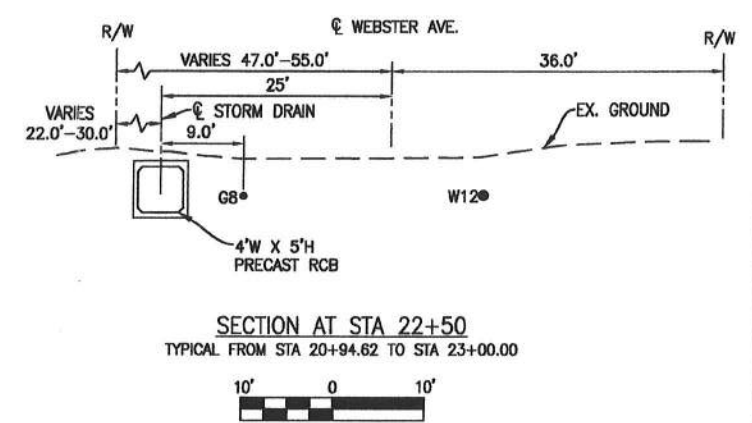
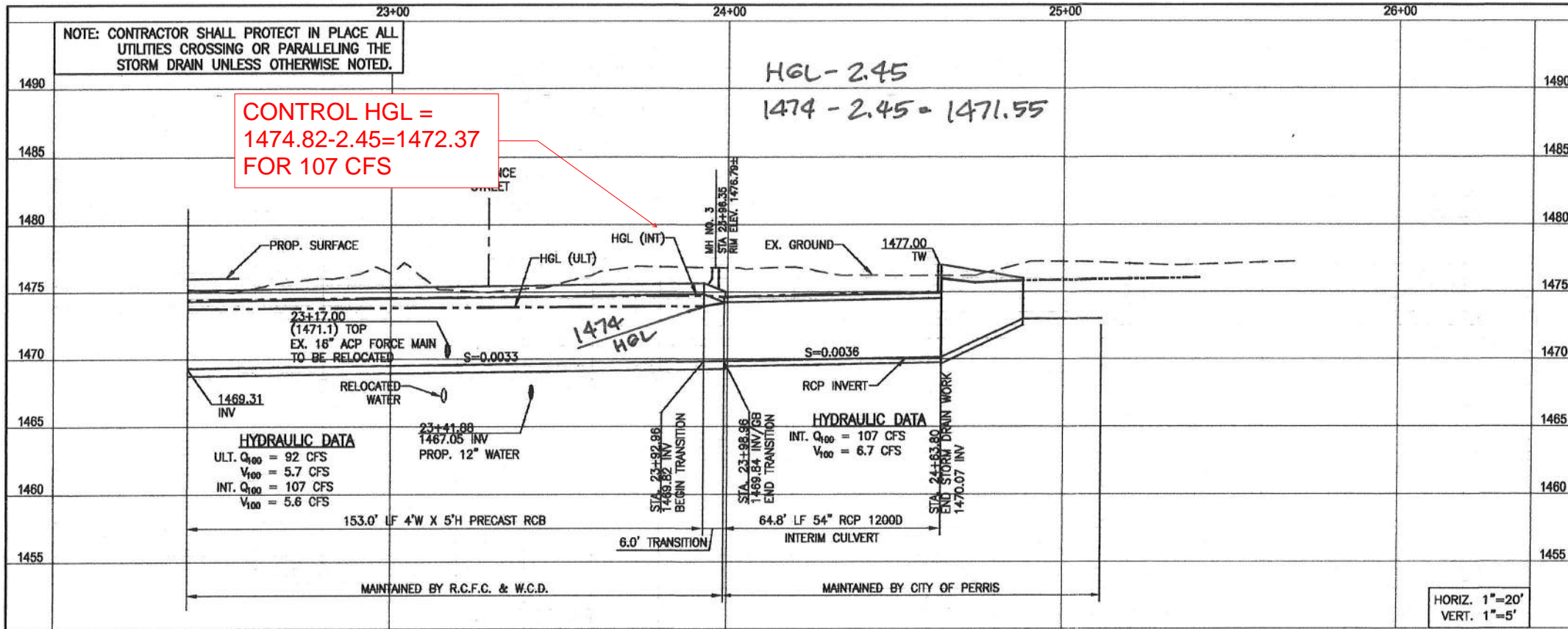
DESIGNED BY: EDT
DRAWN BY: EDT
DATE DRAWN: 2/9/18
CITY ENGINEER: *[Signature]* DATE

REVISIONS	ENGINEER	RCFC/
1. MODIFY CATCH BASIN CONST #2 @ STA. 66+03	HIA 2/2/18	DLG 2/6/18
2. UPDATE Q100 & V100 SH. 2 FROM 10' & 1.5 REV. CONST. NO. 30		
3. REVISE PROJ. NO. 8-18 FROM 147-189-1-1 AND 18-1-1		

CITY OF PERRIS
CITY STANDARD
UTILITY TRENCH SURFACE REPAIR
APPROVED BY: *[Signature]* DATE: 7-12-06
CITY ENGINEER: N.T.S.

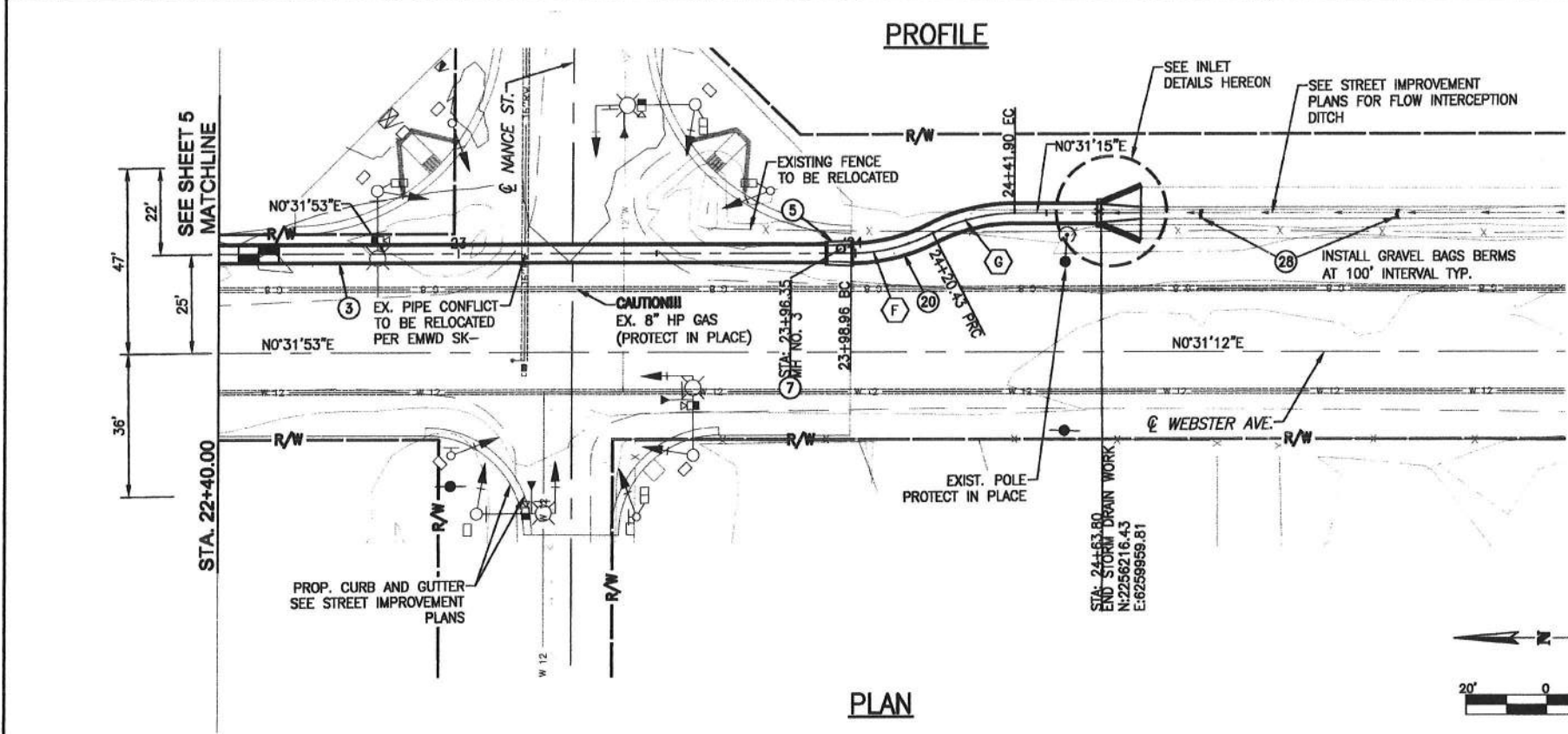
P8228408 PM 36678
CITY OF PERRIS FILE NO. P8-1237

PERRIS VALLEY MDP
LATERAL B-5
STAGE 2
CONNECTOR PIPE PROFILES
PROJECT NO. 4-0-00461
DRAWING NO. 4-1121
SHEET NO. 14 OF 14



F CURVE DATA
 $\Delta = 27^{\circ}20'29''$
 $R = 45.00'$
 $T = 10.95'$
 $L = 21.47'$
 $BC = 23+98.96$
 $EC = 24+20.43$
 $PI = N 2256268.80$
 $E 6259950.24$

G CURVE DATA
 $\Delta = 27^{\circ}19'48''$
 $R = 45.00'$
 $T = 10.94'$
 $L = 21.46'$
 $BC = 24+20.43$
 $EC = 24+41.90$
 $PI = N 2256249.27$
 $E 6259960.11$



CONSTRUCTION NOTES:

- 3) CONSTRUCT PRECAST RCB PER SPPWC STD. DWG. 390-1 (FOR SHALLOW COVER FROM 0' TO 2')
- 5) CONSTRUCT TRANSITION STRUCTURE NO. 1 PER R.C.F.C. & W.C.D. STD. DWG. TS301. REINFORCEMENT AND CONCRETE THICKNESS SHALL BE THAT OF A 6'X5'H RCB PER CALTRANS STD D80
- 7) CONSTRUCT MANHOLE NO. 3 PER R.C.F.C. & W.C.D. STD. DWG. NO. MH253
- 15) CONSTRUCT CABLE RAILING PER CALTRANS STD. DWG. NO. B11-47
- 20) CONSTRUCT 54" RCP D-LOAD PER PLAN
- 21) CONSTRUCT TRASH RACK (INCLINED) PER SPPWC STD 360-2
- 24) CONSTRUCT PIPE CULVERT HEADWALL AND WARPED WINGWALLS PER CALTRANS STD. DWG. NO. D86B AND DETAILS HEREON.
- 28) INSTALL GRAVEL BAG BERM PER EROSION CONTROL DETAIL CASQA SE-7 AND CALTRANS STANDARD SPECIFICATIONS 2015. SEE DETAIL ON SHEET 6

<p>Don't Dig...Until You Call! U.S.A. Toll Free: 1-800-227-2800 for the location of buried utility lines. Don't disrupt vital services. TWO WORKING DAYS BEFORE YOU DIG</p>	<p>ALBERTA ASSOCIATES ENGINEERING CONSULTANTS 3789 MCCRAY STREET, RIVERSIDE CA 92504 PH. (951) 689-1070 FAX (951) 788-1258</p> <p>DATE: 2/22/17 ENGINEER: RCE</p>	<p>CITY OF PERRIS APPROVED BY: DATE: 3.1.17 CITY ENGINEER</p>	<p>BENCH MARK: 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 CA STANDARD DISK STAMPED 40 Y 1931.</p> <p>ELEV. = 1496.35 (NVD 88) NAVD88 - 2.45 = NGVD29</p>	<p>REVISIONS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>NO.</th> <th>DESCRIPTION</th> <th>APPR.</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	NO.	DESCRIPTION	APPR.	DATE					<p>RIVERSIDE COUNTY FLOOD CONTROL WATER CONSTRUCTION DISTRICT RECOMMENDED FOR APPROVAL: APPROVED BY: DATE: 3/15/2017</p>	<p>PM 36726 PERRIS VALLEY MDP LATERAL B-5 STAGE 1 PLAN AND PROFILE STA. 22+40.00 TO STA. 23+95.54</p>	<p>PROJECT NO. 4-0-00461 DRAWING NO. 4-1109 SHEET NO. 6 OF 11</p>
NO.	DESCRIPTION	APPR.	DATE												

G:\2015\15-0347\DRAWINGS\PLAN SHEETS\15-0347 - C - SD - LATERAL B5.DWG 2/23/2017 10:56:14 AM